PICO◊ sNPWT clinical cases

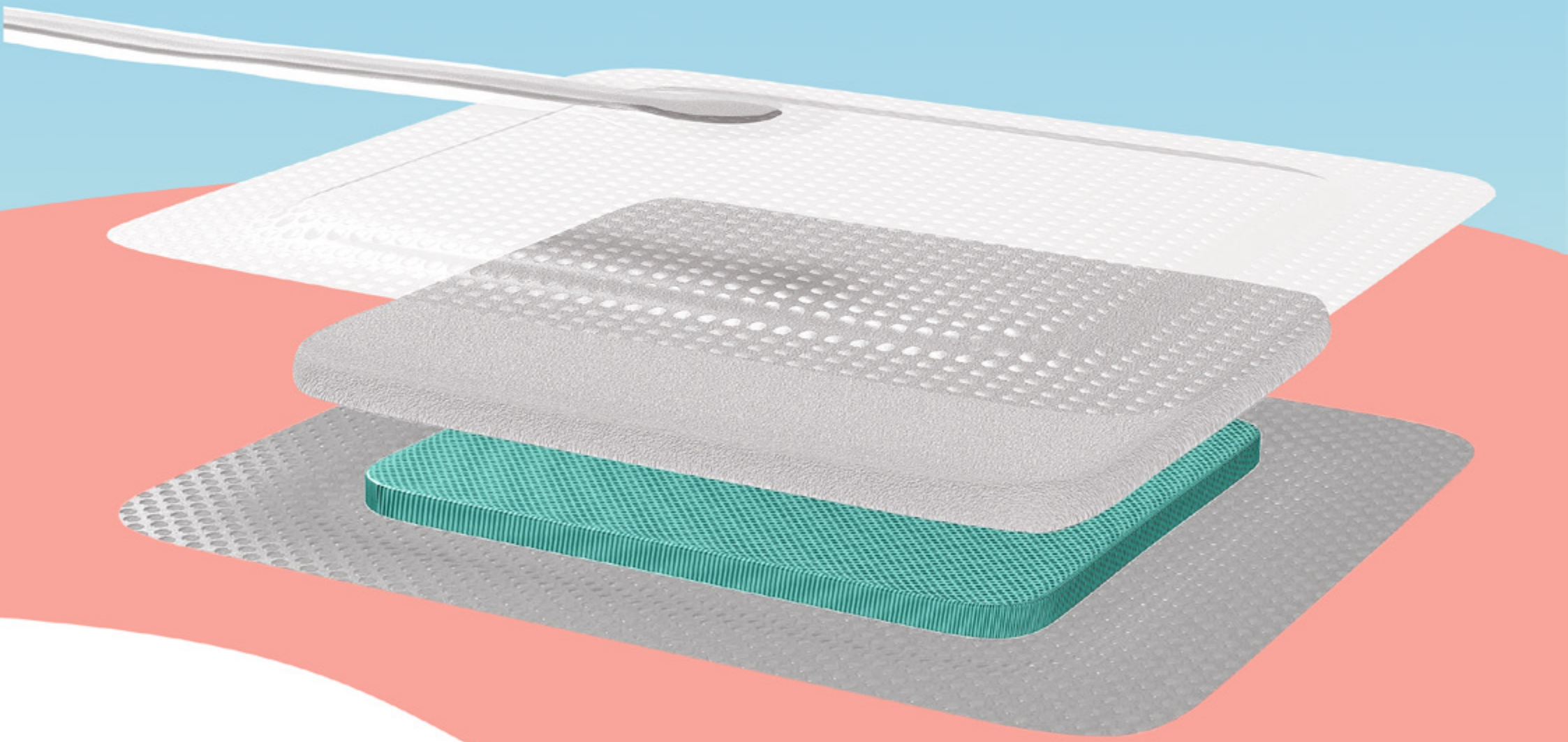
Smith+Nephew

PICO◊
Single Use Negative Pressure
Wound Therapy System

Helping you get **CLOSER TO ZERO◊** delay in wound healing.[1-3]

AIRLOCK◊

Wide delivery. Constant pressure. **Optimal outcomes.**



USING PICO® SNPWT ON CLOSED SURGICAL INCISIONS TO HELP PREVENT SURGICAL SITE COMPLICATIONS

USING PICO SNPWT ON OPEN WOUNDS TO HELP ACHIEVE WOUND HEALING OR KICK START STALLED WOUNDS

PICO SNPWT ORDERING INFORMATION AND ACKNOWLEDGEMENTS

Symbol indicates wound is deeper than 2cm

Click on the case to go to section

Using PICO◊ sNPWT on **closed surgical incisions** to help prevent surgical site complications

Preventive use of PICO◊ sNPWT after Achilles tendon surgery

Dr Daniel Herrero (Assistant Specialist) - *Department of Trauma and Orthopaedic Surgery, De Liria Hospital (Valencia - Spain)*

Key points

Patient had previous complications. PICO sNPWT helped prevent further complications (dehiscence and infection)

7 days

PICO Dressing was used for 7 days with no dressing changes required during the course of therapy

Positive impact to the healthcare team and system

Patient

A 41-year-old man with no medical history of interest or background treatment. The previous year he underwent a first surgery for Achilles tendon rupture sustained while playing football. At three weeks, the staples and part of the plaster were removed. After removing all the staples and placing the splint, the team noticed clinical signs of infection. The wound showed poor healing at one month. The depth of the deficit had increased, allowing visualisation of the tendon.

Treatment

The patient received treatment with NPWT for two weeks, after which the dressing was removed due to persistent clinical signs of infection. He underwent another surgery in March 2017 to clean up the infection and debride some of the necrotic tissue. It was decided to use the PICO sNPWT System for one week in order to avoid the complications seen after the first surgery.

Follow-up/results

The PICO sNPWT device was removed 7 days after the procedure. Since there was no exudate, no dressing change was required before this time and the surgical wound appeared to be healing well. It was decided to apply a conventional post-surgical dressing until the stitches were removed.

Conclusions

The preventive use of the PICO sNPWT device proved very satisfactory in this case. It contributed to the prevention of complications (dehiscence and infection) seen after the first surgery. Such complications directly affect not only the patient, but also the healthcare team and the health system.

Day 0
Start of PICO sNPWT

Application of PICO sNPWT

Day 5
Follow-up at 5 days

Day 7
Follow-up at 7 days
End of PICO sNPWT treatment

Preventive use of PICO◊ sNPWT in a Caesarean section

Dr Noemí Gómez Bermejo (Specialist Physician) - *Department of Obstetrics and Gynaecology - Móstoles University Hospital (Madrid - Spain)*

Key points

Short healing time which is key for mother to take care of their newborn

PICO sNPWT is easy to use, it requires minimal training for both healthcare professionals and patients

Positive outcomes driven potentially by a reduction in complications (such as dehiscence or hypertrophic scars)

Introduction

Gynaecology departments do not widely use negative pressure wound therapy (NPWT), due to the low prevalence of wounds in their field NPWT is currently used as an adjunct to treatment for the prevention of surgical site complications. A wider range of applications is opening up in this department.

We present a case report in which PICO sNPWT was used on a caesarean section.

Patient

A 17 year-old woman of Afro-Caribbean descent who had had a previous caesarean section. At the start of pregnancy, she had a body mass index (BMI) of 27 and she had since gained 6kg in weight. She smoked one cigarette/day. She had no other relevant medical history.

Treatment

Due to the patient's previous caesarean section, there was a risk of surgical site complications.

Caesarean delivery was performed. The newborn infant weighed 4.105kg.

Staple skin closure was performed. A single use negative pressure wound therapy device (PICO sNPWT) was applied for prevention of SSC after the intervention while the patient was still in the operating theatre.

In this case, the purpose of using the PICO System was to:

- Decrease tension on the suture line[1]
- Manage fluid and promote healing[2]
- Stimulate the micro-circulation[3]
- Protect the incision from external aggressors (the dressing acts as physical and antimicrobial barrier,[4] and allows minor wound manipulation)[5]
- Minimise trauma to the incision during application and removal of the dressing[6]

Follow-up/results

The wound appeared to be healing well at day 8.

The dressing had to be changed at 24 hours due to wound exudate. At this time, the wound showed good clinical progress, with clean edges and a favourable appearance.

No further dressing changes were needed after the first 24 hours.

The dressing was removed one week later. The surgical site was in good clinical condition, with no maceration and good wound shrinkage. The staples were removed at this time.

Conclusions

The patient had no difficulty understanding the portable system, no problems with the device, and was able to have a normal life.

For health care professionals, this experience with the single use NPWT device (PICO sNPWT) was a positive one. The use of the device requires minimal training for health care professionals or patients.

Clinically, the risk of seroma decreases, and with it the risk of complications such as dehiscence or hypertrophic scars.

The use of negative pressure wound therapy for prevention of SSC has already been described in multiple studies in the literature. Depending on the patient's risk factors, caesarean section wounds may be eligible for sNPWT.

Day 1
Star of streamer

Day 1
Application of PICO sNPWT in the operatin theatre

Day 8
PICO sNPWT Dressing change after 1 week

Appearence of the surgical wound after removal the PICO Dressing

Appearence of the surgical wound upon stample removal

1. Wilkes RP, Kilpad DV, Zhao Y, Kazala R, McNulty A. Closed incision management with negative pressure wound therapy (CIM): biomechanics. *Surg Innov*. 2012 Mar;19(1):67–75. Epub 2011 Aug 25. **2.** Stannard JP, Robinson JT, Anderson ER, McGwin G Jr, Volgas DA, Alonso JE. Negative pressure wound therapy to treat hematomas and surgical incisions following high-energy trauma. *J Trauma*. 2006 Jun;60(6):1301–6. **3.** Atkins BZ, Tetterton JK, Petersen RP, Hurley K, Wolfe WG. Laser Doppler flowmetry assessment of peristernal perfusion after cardiac surgery: beneficial effect of NPWT. *Int Wound J* 2010; dol: 10.11 11/j.1742-481X.2010.00743.x. **4.** Smith+Nephew February 2011.Bacterial Barrier Testing (wet-wet) of PICO dressing with a 7 day test duration against S. marcescens. Internal report. 1102010. **5.** Gommoll AH, *et al.* Incisional vacuum-assisted closure therapy. *J Orthop Trauma* 2006;20:705–709. **6.** Payne C, Edwards D. Application of the Single Use Negative Pressure Wound Therapy Device (PICO) on a Heterogeneous Group of Surgical and Traumatic Wounds. *ePlasty*. 2014:152–166.

Preventive use of PICO◊ sNPWT in Caesarean sections case

Dr Antonio de la Torre (Gynaecologist), Dr Elena Marín (Gynaecologist), Ms Concepción Navarro (Nursing Supervisor) - *Reina Sofía University Hospital (Córdoba - Spain)*

Key points

PICO sNPWT was associated with the prevention of SSI and haematoma in this patient

7 days

PICO sNPWT has wear time of up to seven* days which helps leaving the wound undisturbed

Surgical site infections (SSIs) following C-sections can significantly increase length of hospital stay from 2 to 7 days.[1]

*PICO 7 sNPWT: up to 7 days; PICO 14 sNPWT: up to 14 days.

Introduction

Healthcare-associated infections are a leading cause of patient mortality and morbidity, with surgical site infections (SSI) among the most common. Patients who develop a SSI are more likely to be admitted to an intensive care unit, to be readmitted to the hospital and to die.[2] In addition, the development of a SSI prolongs hospital stays, considerably increases healthcare costs and carries a significant emotional cost for patients and for their relatives.[1] We present a case in which the PICO Single Use Negative Pressure Wound Therapy System (sNPWT) was used to prevent surgical site complications in a patient who underwent an elective caesarean section.

Patient 1

The patient was a 33 year-old woman with a number of risk factors, including uncontrolled diabetes, smoking (about 10 cigarettes/day during pregnancy) and a slightly elevated BMI (weight not specified, but some abdominal overhang after caesarean section). A caesarean section was scheduled (baby in the breach position).

Patient 2

The patient was a 38 year-old woman with no underlying diseases and not currently on any medication who underwent an elective caesarean section.

Treatment

The PICO sNPWT device was applied in the operating theatre immediately after closing the incision. The PICO System has a wear time of up to seven days. The dressing used to manage the exudate is inspected for saturation at 24 and 48 hours in case it needs changing. A replacement dressing is included. As can be seen in the picture, the dressing was not saturated, so that there was no need to change it. The patient was discharged from hospital 72 hours after the surgery. Before then, the team decided to examine the incision that motivated the change of PICO dressing.

Follow-up/results

The patient was asked to visit the hospital 7 days post-intervention for removal of the PICO sNPWT system and assessment of wound healing. As can be seen from the pictures, the wound healed very well with no visible haematoma, seroma or clinical signs of infection. The staples were removed and a conventional dressing applied. The patient returned for follow-up 15 days later, showing no signs of involution.

Conclusions

The satisfactory results obtained in this case suggest that the PICO System may constitute a new tool to improve clinical results in gynaecology. As illustrated in this case, PICO sNPWT helps improve the post-operative management of this type of intervention, especially in patients with risk factors.

Patient 1	Patient 2
Day 0 *Application of the PICO System in the operative theatre* 	**Day 0** *Application of the PICO System in the operative theatre* 
Day 3 *Exudate management at 72 hours* 	**Day 3** *Exudate management at 72 hours* 
Day 3 *Follow-up at 72 hours* 	**Day 3** *Follow-up at 72 hours* 
Day 7 *Removal of the PICO System. Follow-up at 7 days* 	**Day 7** *Removal of the PICO System. Follow-up at 7 days* 

1. Jenks PJ, Laurent M, McQuarry S, Watkins R. Clinical and economic burden of surgical site infection (SSI) and predicted financial consequences of elimination of SSI from an English hospital. *Journal of Hospital Infection.* 2014 Jan 1;86(1):24–33. **2.** Sugrue M, *et al.* World Union of Wound Healing Societies (WUWHS) Consensus Document. Closed surgical incision management: understanding the role of NPWT. *Wounds International*, 2016.

Preventive use of PICO◊ sNPWT in a patient who underwent a triple coronary bypass

Dr Ángela Irabien Ortiz (Resident), Dr Álvaro Pedraz Prieto (Resident), Dr Hugo Rodríguez-Abella González (Assistant) - *Cardiac Surgery, Gregorio Marañón University Hospital (Madrid - Spain)*

Key points

The patient's sternotomy wound treated with PICO sNPWT healed completely without any complications. In contrast, the patient's saphenectomy wound which was untreated with PICO sNPWT exhibited complications, including infection and dehiscence

7 days

PICO Dressing was used for 7 days with no dressing changes required during the course of therapy

Cardiac surgeons considered using PICO system on a consistent basis to help prevent surgical site complications in patients with risk factors

Introduction

Surgical site infections (SSI) are the most common cause of nosocomial infection in post-operative patients.[1] The incidence of SSI after sternotomy in cardiac surgery patients ranges between 4-7% for superficial infections and 1-4% for deep infections.[1] This is associated with increased post-operative morbidity and mortality, and increased healthcare costs per procedure.[2]

Patient

A 71-year-old woman with a history of hypertension, type 2 diabetes, dyslipidaemia and ischaemic cardiopathy. The patient was scheduled to undergo revascularisation surgery with a triple coronary bypass using a saphenous vein graft.

Treatment

The patient underwent a triple coronary bypass and it was decided to use the PICO sNPWT System prophylactically as a dressing for the sternotomy incision, with 1-2 dressings per week depending on the exudate managed by the PICO System.

Follow-up/results

As can be seen in the pictures, the PICO device was placed on the sternotomy wound in the operating theatre. No dressing change was required for 7 days. The surgical wound healed completely without any complications. In contrast, the saphenectomy wound did not heal well, showing complications including infection and dehiscence.
Systemic antibiotics were required, as well as local treatment with the PICO System.

Conclusions

This case potentially shows the substantial differences in the healing of surgical wounds treated with vs. without PICO sNPWT. Given the success obtained, the cardiac surgeons considered using the PICO System on a consistent basis in order to help prevent surgical site complications in cardiac surgery patients with risk factors.

Closure of the sternotomy wound

Application of the PICO sNPWT System in the operating theatre

End of PICO sNPWT treatment
Follow-up at 7 days

Wound NOT treated with PICO sNPWT
Follow-up of saphenectomy at 7 days

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

1. Witt-Majchrzak A, Żelazny P, Snarska J. Preliminary outcome of treatment of postoperative primarily closed sternotomy wounds treated using negative pressure wound therapy. *Przeglad Chirugiczny*. 2014;86(10):456-465. **2.** Sugrue M, *et al.* World Union of Wound Healing Societies (WUWHS) Consensus Document. Closed surgical incision management: understanding the role of NPWT. *Wounds International*, 2016.

Use of PICO◊ sNPWT on an incision made during full surgical revision of ulnar osteosynthesis

Dr Adrien Jacquot - *Clinique Louis Pasteur [Louis Pasteur Hospital], (Essey les Nancy - France)*

Key points

PICO System was used and discontinued at day 6. There was no sign of inflammation or dehiscence during the treatment period

The patient's wound fully healed without any complications

As a new user to PICO sNPWT System, this surgeon was *satisfied with the efficacy and rapid treatment time* in this case

Patient

A 45-year-old male patient living independently.

The patient underwent full revision of left ulnar osteosynthesis due to inadequate fracture reduction. Six weeks earlier, the patient was in a road accident and sustained a complex open fracture of the ulna with transolecranon dislocation, for which he underwent osteosynthesis with two plates. During treatment with PICO sNPWT, the patient was on antibiotics (Cefazoline™).

PICO sNPWT treatment methodology

It was decided to apply the PICO System in the operating theatre. The PICO dressing size selected for the left elbow of the patient was 10 x 40cm. The incision line measured 24cm L x 1cm W, staples present.

The surgeon decided to leave the PICO System in place for 6 days.

Course of PICO sNPWT

The patient was hospitalised for 6 days before being transferred to post-acute care and rehabilitation. Since the surgery, the patient's elbow has been continuously immobilised in a splint and he has been subject to increased monitoring by the nursing team.

Treatment outcome

Negative pressure wound therapy was discontinued at D6. There was no sign of inflammation or dehiscence and the PICO System was replaced with a OPSITE◊ POST-OP VISIBLE Waterproof, Bacteria-proof Dressing with See-through Absorbent Pad.

The total duration of treatment was 6 days.

The patient attended a follow-up visit at D22, after removal of the staples. He remained in post-acute and rehabilitation care. Note that antibiotic therapy was discontinued and the splint removed on that day. The patient could move his elbow again, while receiving care from a physiotherapist.

By D54, the wound was fully healed without any complications.

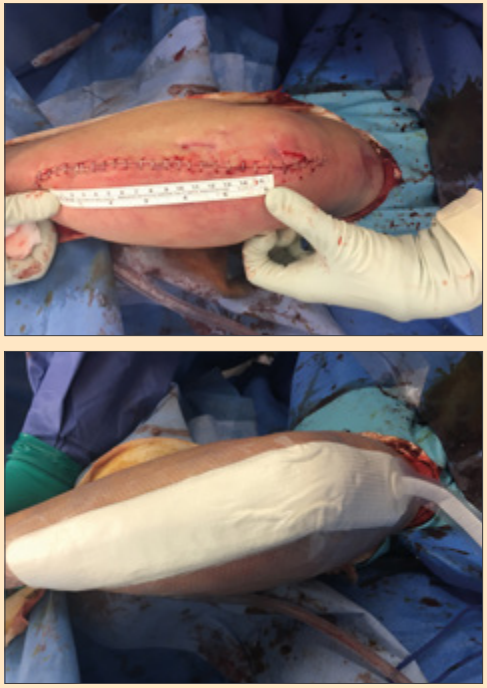
This was the first time that the surgeon had used the PICO device and he was satisfied with its ease of use, its efficacy and the rapid treatment time.

Continued on next page
1 2

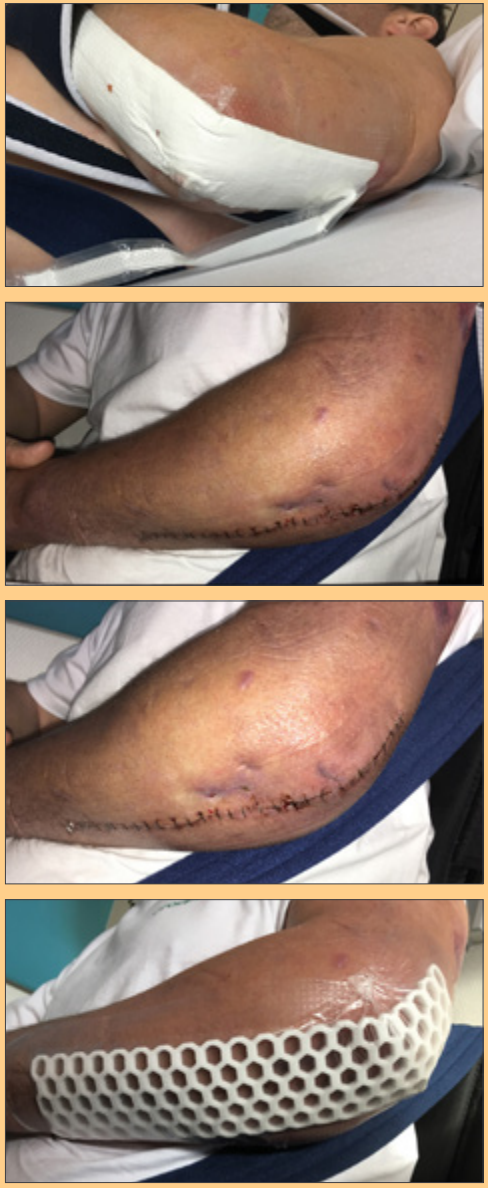
Use of PICO◊ sNPWT on an incision made during full surgical revision of ulnar osteosynthesis

Dr Adrien Jacquot - *Clinique Louis Pasteur [Louis Pasteur Hospital], (Essey les Nancy - France)*

Day 0



Day 6



Day 22

Day 54

PICO◊ sNPWT on a surgical incision line after treatment of pseudarthrosis

Dr Frank Wein - *Clinique Louis Pasteur, Essey les Nancy (France)*

Key points

PICO sNPWT preserved the peri-wound skin and caused no pain on dressing removal

Successful wound closure with zero complication

The patient was pleased with the outcome and use of the devices, which allowed him to retain his independence

Patient

A 59 year-old male.

Independent patient living with his spouse.

- Cardiac history
- Class 1 obesity
- Fragile skin

Wound history

The patient underwent surgical treatment for left leg pseudarthrosis, the second in 4 months. The patient had a household accident that resulted in an open fracture of the tibia. The wound healing process was complicated by an infection. The patient was prescribed antibiotic therapy (Cefazoline™).

PICO sNPWT treatment methodology

- One day after the surgery, the surgeon decided to apply two PICO dressings
- The incision lines were cleaned with iodine antiseptic four times. The PICO dressing selected for the knee wound was 15 x 20cm
- At this time, the incision line was 6cm L x 1cm W. The PICO dressing applied on the tibia was 15 x 30cm in size, and the incision line 21cm L x 1cm W, with staples on both incision lines
- The surgeon decided to leave the PICO dressing on the knee in place for 7 days and to change the PICO dressing on the tibia at D2 for monitoring purposes

Course of PICO sNPWT

The patient remained hospitalised for 7 days before being discharged home.

Since the surgery, the leg has been immobilised in a boot and weight-bearing was not permitted.

At D2, the PICO dressing applied on the tibia showed 50% saturation and was removed. Under the dressing, the incision line showed no sign of inflammation.

The PICO dressing applied on the knee was only slightly stained and was left in place.

Treatment outcome

Negative pressure wound therapy was discontinued at D7. Both PICO dressings were removed. The one on the knee was slightly stained while the one below showed 30% saturation. There was no sign of inflammation or dehiscence. PICO sNPWT preserved the peri-wound skin and no pain was reported upon removal. Wound care was continued with hydrocellular dressings.

The total duration of treatment was 7 days.

The patient was pleased with the outcome and the use of the device, which allowed him to retain his independence. He had two pumps with him.

At D16, the staples remained in place, but every second staple was removed that day. Antibiotic treatment was also discontinued, as laboratory tests found no sign of infection.

The walking boot was removed and replaced by a splint. However, weight-bearing was still forbidden.

Full, complication-free healing was achieved at D57. Weight-bearing was permitted from then on.
The surgeon was pleased with the use of the PICO System.

Continued on next page

Note: PICO 7Y sNPWT System (designed to treat two wounds on the same patient simultaneously from one device) could also be used in this case.

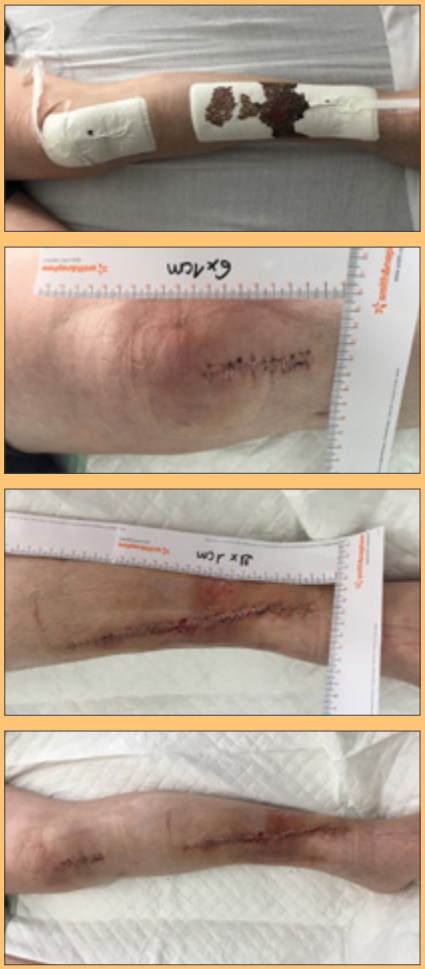
PICO◊ sNPWT on a surgical incision line after treatment of pseudarthrosis

Dr Frank Wein - *Clinique Louis Pasteur, Essey les Nancy (France)*

Day 0

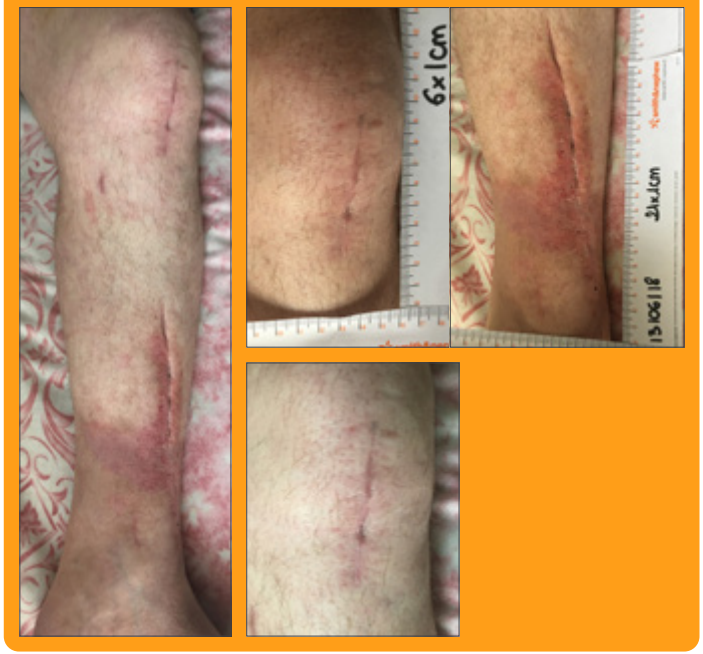
Day 2

Day 7



Day 16

Day 53



Note: PICO 7Y sNPWT System (designed to treat two wounds on the same patient simultaneously from one device) could also be used in this case.

Preventive use of PICO◊ sNPWT on laparotomy wounds in living-donor kidney transplant

Sonia Almansa Saura (RN), Inmaculada Romero Sánchez (RN), Mónica Rodríguez Valiente (RN), Patricio Alcaraz Lorente (Specialist Physician), Teresa Soria Cogollos (Specialist Physician), Gregorio Castellanos Escrig (Head of Department) - *Wound and Diabetic Foot Unit Department of General Surgery and Gastroenterology, V. Arrixaca Clinical University Hospital (Murcia - Spain)*

Key points

Helping eliminate the risks of surgical site infections is important to both physician and patient for kidney transplant procedure. Prophylactic use of PICO sNPWT device proved very satisfactory in this case

Introduction

In Spain and neighbouring countries, an estimated 6-14% of patients admitted to an acute care hospital develop a nosocomial (healthcare-associated) infection (NI).* In the field of NIs, multifactorial surgical wound or surgical site infections occur at variable rates, causing complications, discomfort for the patient and consuming resources (increased average length of stay and hospital costs).*

Patient

A 56-year-old woman with hypertension, dyslipidaemia, stage 4 chronic kidney disease secondary to glomerulopathy and a BMI of 24kg/m².

Treatment

She received a living-donor kidney transplant in the right iliac fossa (29/11/2016) with anastomosis of the laterolateral external iliac artery and the lateroterminal iliac vein. Ureteral re-implant surgery was performed using the Lich-Gregoir technique with the placement of a double J catheter. The skin was closed with staples, disinfected with chlorhexidine and the suture line covered with a 15x30 cm PICO single use NPWT dressing in the operating theatre (Figure 1).

Follow-up/results

The surgical wound and dressing were inspected on 06/12/2016 (day 7 post surgery). The dressing was divided into a grid to get a rough estimate of the amount of exudate absorbed (Figure 2).

The findings were as follows:

- Dressing: Wound exudate (Figure 3) estimated at 15ml by square, making up a total of approximately 45ml in this case
- Wound: No local signs of inflammation (heat, pain, redness swelling, fluctuation, oedema), seroma and/or local infection were observed (Figure 3)

Conclusions

The preventive use of the PICO single use (sNPWT) system in this recipient was associated with the absence of surgical site complications.

Procedure	Dressing changes	Heal time
Current treatment with PICO sNPWT (80 mm Hg)	▪ Weekly dressing changes ▪ No uncovering of the wound or wound management until the PICO sNPWT dressing needs changing (7 days) ▪ Alternate suture removal after 10 days	One wound care session when the dressing is removed after 7 days

Day 0 (Figure 1)
Application of the PICO sNPWT system in the operating theatre

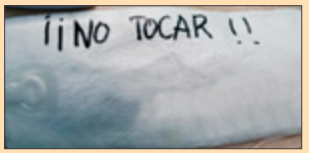
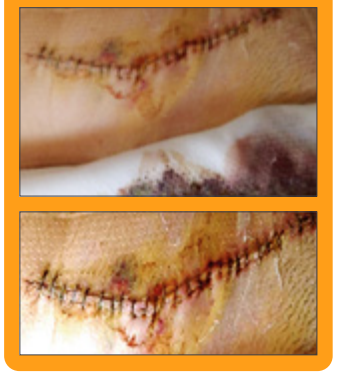


Figure 2
PICO sNPWT dressing divided into areas

¡¡NO TOCAR!! means *DO NOT TOUCH!!!*

Day 7 (Figure 3)
Inspection of the wound/PICO sNPWT dressing at 7 days post-surgery



*Authors' information not validated by Smith+Nephew.

Preventive use of PICO◊ sNPWT in colorectal surgery

Dr Pedro Abadía Barnó, Dr Juan Diego Pina, Dr Javier Die Trill (General Surgeons) - *Colorectal Unit, Ramón y Cajal Hospital (Madrid - Spain)*

Key points

PICO dressing was inspected 24 and 48 hours post surgery but no changing required

The patient did not develop any surgical site complications (oedema, seroma, infection and dehiscence) during and after treatment with PICO sNPWT

Satisfactory healing in the first month after surgery

Introduction

At about 20%, the SSI rate after colorectal surgery is among the highest of all elective surgeries.[1] While the increased use of laparoscopic surgery has contributed to underestimate the incidence of SSIs, strategies to promote recovery after surgery and speed up hospital discharge have led to an increase in the diagnosis of SSIs after discharge. According to the literature, the average time-to-diagnosis of SSIs is seven days in the hospital and 14 days after discharge.* Unsurprisingly, due to the high amounts of bacteria present, rates of SSI after colorectal surgery are higher than in other fields. Emergency interventions for the management of purulent peritonitis or intestinal perforations are associated with a very high risk of SSI.*

Patient

A 78 year-old man, ASA III with a body mass index (BMI) of 27 kg/m^2 and a history of type 2 diabetes, chronic renal failure, atrial fibrillation treated with Sintrom™, and gastric ulcer perforation 20 years ago, treated by midline laparotomy. The patient had midline herniation and left colon cancer.

Treatment

Elective surgery by midline laparotomy consisted of left hemicolectomy with mechanical anastomosis and eventroplasty with Polypropylene Mesh, intra-abdominal drainage and placement of two subcutaneous drainages.

As can be seen in the photograph, the surgical wound had a length of 25cm and, given the patient's personal history described above, it was decided to use the PICO single use NPWT system to help reduce the risk of surgical site complications (oedema, seroma, infection, dehiscence).[2] As shown in the picture, the PICO sNPWT device was applied in the operating theatre immediately after closure of the surgical wound and with the vacuum pump tube directed cranially so as to avoid problems during hospitalisation.

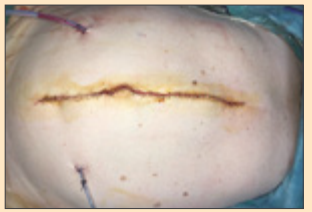
Follow-up/results

The PICO dressing was inspected at 24 and 48 hours after surgery, but did not need changing, so that the surgical wound was uncovered on day 6 with no evidence of complications, as shown in picture Day 7. After discharge home and at the one-month follow-up visit, the incision was fully healed without complications.

Conclusions

The preventive use of the PICO sNPWT system in this case achieved a very satisfactory outcome. Despite the patient's risk factors and the surgery itself, the wound looked good, with no evidence of complications and satisfactory healing in the first month after surgery.

Day 0
Surgical wound closure



Day 0
Application of the PICO sNPWT system in the operating theatre

Drain removal from the surgical wound

Day 7
End of PICO sNPWT application

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

*Authors' information not validated by Smith+Nephew.

1. Hübner M, Diana M, Zanetti G, Eisenring MC, Demartines N, Troillet N. Surgical Site Infections in Colon Surgery: The Patient, the Procedure, the Hospital, and the Surgeon. *Arch Surg.* 2011;146(11):1240–1245. doi:10.1001/archsurg.2011.17.
2. Saunders C, Buzza K, Nherera L. 2019. A single use negative pressure system reduces surgical site complications compared with conventional dressings in closed surgical incisions: a systematic literature review with meta-analysis. Poster presented at the European Wound Management Association annual meeting, June 5–7, 2019, Gothenburg, Sweden.

PICO◊ sNPWT after mastectomy with no skin suture

Dr Antonio Rodríguez Oliver, Dr Aida González Paredes, Dr Mª Teresa Aguilar Romero, Dr José Mª Puerta Sanabria - *Virgen de las Nieves University Hospital (Granada - Spain)*

Key points

4 days

The drainage tube was removed after four days due to adequate fluid management

The patient was discharged within seven days of surgery due to good wound healing

Introduction

Single use negative pressure wound therapy (sNPWT) after mastectomy with no skin suture.

Patient

A 68 year-old woman with a personal history of diabetes, hypertension and hyperlipidaemia.

Diagnosed with invasive lobular carcinoma (ILC) of the left breast via the Breast Cancer Early Detection Programme and referred to Virgen de las Nieves Hospital (Granada) for further investigation and treatment.

Magnetic resonance imaging (MRI) was performed, according to which the wound measured 5 x 3.5 x 2.7cm.

The Gynaecological Oncology Tumour Committee decided to perform a total mastectomy of the left breast and selective sentinel lymph node biopsy.

Treatment

The scheduled surgery was performed with no notable incidents, with subcutaneous drain placement and closing of the wound with subcutaneous sutures and intermittent stitches, but no cutaneous suture, as it was decided to place a PICO dressing on the incision.

Follow-up/results

The patient was discharged 4 days later after good pain control was achieved and the drainage tube was removed due to low flow.

A follow-up appointment was scheduled 7 days after the intervention for removal of the PICO dressing and assessment of the wound.

Given the good condition of the wound, the patient was discharged pending the final histological results.

Important: PICO sNPWT is contraindicated in patients with malignancy in the wound bed or margins of the wound (except in palliative care to enhance quality of life)

The figure shows a subcutaneous mastectomy incision with drain insertion at the distal end

PICO Dressing placed over the mastectomy incision, distally to the dressing placed on the drain exit

PICO Dressing 24 hours after placement. The drain had 100cc of serosanguineous fluid

Surgical site after removal of the PICO Dressing 7 days after surgery

Preventive use of PICO◊ sNPWT in a patient who underwent periareolar mastopexy

Dr Joaquín Navarro Cecilia (Cosmetic and Plastic Surgeon) - *Private practice (Jaén - Spain)*

Key points

Only one dressing change required for both wounds

Patient was comfortable and confident while performing activities of daily living with PICO sNPWT

No signs of surgical site infections, peri-lesional bruising, which delivers patient satisfaction

Introduction

Surgical wound complications such as infection or haematoma are associated with an increase in morbidity, mortality and length of hospital stays, which is not only a health problem for patients, but also poses a huge economic burden for the healthcare system as a whole.[1] An in-depth knowledge of the financial costs of SSIs is especially useful when investing resources in monitoring and prevention programs.

Patient

A 44-year-old woman with no relevant medical history and not receiving any kind of background medication. The patient had a periareolar mastopexy in November 2015.

Treatment

She was then scheduled for hypertrophic scar removal, areolar reduction and a new round block periareolar suture. In order to prevent post-operative complications such as bruising and to achieve more aesthetic healing than with the first surgery performed in 2015, the team decided to apply the PICO single use negative pressure wound therapy device. The PICO System is sterile, which facilitates its application in the operating theatre immediately after closure of the surgical incision. The PICO dressing is changed once or twice per week depending on saturation.

Follow-up/results

After application in the operating theatre, the PICO single use NPWT system was inspected only 24 hours post-surgery. It was found to be working well, and neither of the two dressings was saturated. It was checked again at 48 hours, with no further inspections until 7 days after the intervention, when the PICO single use NPWT system was removed. As can be seen in the pictures, after suture and sNPWT removal, the incision was completely healed, with no perilesional bruising or other surgical site complications.

Conclusions

Both the clinical team and the patient were very happy with the outcome of the surgery. The hypertrophic scars were replaced by aesthetic scars. There were no complications that might have negatively affected the patient, the healthcare team or the health system. The patient said that she felt very comfortable and confident while performing activities of daily living with the PICO single use NPWT system.

Before surgery

After surgery

Application of PICO sNPWT dressing

Right breast

Left breast

Note: PICO 7Y sNPWT System(designed to treat two wounds on the same patient simultaneously from one device) could also be used in this case.

1. Sugrue M, *et al.* World Union of Wound Healing Societies (WUWHS) Consensus Document. Closed surgical incision management: understanding the role of NPWT. *Wounds International*, 2016.

PICO◊ sNPWT on a surgical incision line after a primary total knee arthroplasty

Dr Frank Wein - *Clinique Louis Pasteur, Essey les Nancy (France)*

Key points

PICO sNPWT allowed for the use of compression stocking

PICO sNPWT improved healing, with no sign of inflammation or dehiscence

Patient was pleased with the outcome, which allowed her to regain daily independence

Patient

A 76 year-old female.

Patient living independently at home, alone.

- Hypertension
- Class 2 obesity
- Treated for leukaemia

Wound history

The patient was hospitalised for a right total knee arthroplasty. She remained on anticoagulation therapy until one week before the procedure. She was also prescribed antibiotics (Cefazoline™).

PICO sNPWT treatment methodology

- In view of the patient's history, the surgeon decided to apply a PICO dressing. At the surgeon's request, the dressing was applied two days after the intervention
- The incision line was cleaned four times with iodine antiseptic. The chosen PICO dressing size was 10 x 30 cm
- At the time, the incision line measured 15.5 cm L x 1 cm W and staples were present
- The surgeon decided to leave the PICO System in place for 7 days

Course of PICO sNPWT

The patient remained hospitalised for 7 days due to lack of beds in the post-acute care and rehabilitation ward.

The patient's leg was not immobilised and she was able to wear her compression stocking, which was compatible with the PICO device.*

At D1, 25% saturation of the dressing was observed. She has been subject to increased monitoring by the nursing team.

Treatment outcome

PICO sNPWT was discontinued at D7. At the time of removal, the PICO dressing showed ~50% saturation, with no sign of inflammation or dehiscence underneath.

The patient was transferred to post-acute care and rehabilitation at D7. Note that the patient received physiotherapy throughout treatment with PICO sNPWT.

The total duration of treatment was 7 days. PICO sNPWT was then replaced with a OPSITE◊ POST-OP VISIBLE Waterproof, Bacteria-proof Dressing with See-through Absorbent Pad.

The patient was was re-examined at D22, after removal of the staples. The incision line was slightly crusted.

Antibiotic therapy was also discontinued.

By D55, the wound was fully healed without any complications.

The patient was pleased with the outcome and the use of the device, which allowed her to retain her daily independence.

The surgeon was ALSO pleased with the device.

Continued on next page
1 2

*PICO sNPWT System can be used in conjunction with adjuvant Pressure Garment Therapy (PGT) following surgery.

PICO◊ sNPWT on a surgical incision line after a primary total knee arthroplasty

Dr Frank Wein - *Clinique Louis Pasteur, Essey les Nancy (France)*

Post surgery

Day 1

Day 7

Day 22

Day 55

Preventive use of PICO◊ sNPWT in a patient undergoing radical nephrectomy

Dr Fernando Vázquez - *Department of Urology, Virgen de las Nieves Hospital (Granada - Spain)*

Key points

PICO sNPWT helped reduce surgical site complications in a patient undergoing radical nephrectomy, which is a high-risk surgery

Improved healing progress which led to reduced nursing time

Introduction

Radical nephrectomy is a surgical treatment for suspected cancer option. Open radical nephrectomy, which requires subcostal laparotomy via the anterior approach, is the treatment of choice for vena cava thrombosis in renal cancer. The procedure has a long recovery time, with a risk of post-surgical pain or complications.*

Patient

The patient was a 71-year-old woman referred from another hospital with a large tumour occupying the entire right kidney and renal vein thrombosis ascending into the vena cava to the supra-hepatic veins, all diagnosed because of blood in the urine.

Treatment

She underwent right radical nephrectomy + vena cava thrombectomy + retroperitoneal lymphadenectomy via the anterior approach with a bilateral Chevron incision. To reduce the risk of surgical site complications, PICO single use negative pressure therapy was applied in the operating theatre after closure of the surgical incision. The PICO sNPWT dressing was to be left on for one week.

Follow-up/results

At the time of removal after 7 days, the dressing was slightly stained with serosanguinous fluid (Figure 1) and changed for a conventional dressing. The wound appeared to be healing well (Figure 2) and the patient was discharged 10 days after the procedure.

Follow-up 9 weeks after surgery found the wound to be healing well (Figures 3, 4).

Conclusions

This case report marks a before and after in the management of surgical wounds in patients with risk factors or after high-risk surgery. The preventive use of the PICO sNPWT led to rapid and complication-free wound healing, with the potential to reduce nursing time.

Figure 1
PICO dressing at 7 days

Figure 2
Follow-up at 7 days

Figure 3
Follow-up at 9 weeks

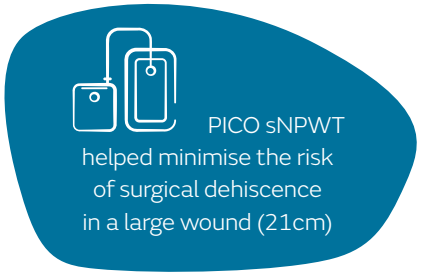
Figure 4
Follow-up at 9 weeks

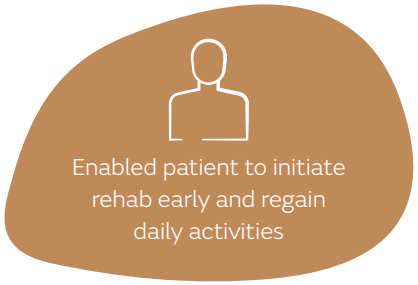
*Authors' information not validated by Smith+Nephew.

PICO◊ sNPWT on a surgical incision line after revision total knee arthroplasty

Dr Thomas Goetzmann - *Clinique Louis Pasteur, Essey les Nancy (France)*

Key points





Patient

- A 73 year-old female, the patient was unable to walk unaided.
- Class 1 obesity.
- History of total knee replacement (TKR) revision surgery due to infection; the patient had already received two TKRs.
- The patient was hospitalised for left total knee arthroplasty revision and put on antibiotics (Vancomycin™)

PICO sNPWT treatment methodology

- It was decided to apply the PICO sNPWT system in the operating theatre. The chosen PICO dressing size was 10cm x 40cm and the incision line measured 21cm L x 1cm W, with sutures present
- The surgeon decided to leave the PICO System in place for 6 days

Course of PICO sNPWT

The patient was hospitalised for 6 days before transfer to post-acute care and rehabilitation.

The patient's leg was not immobilised and she was able to wear her compression stocking, which is compatible with the PICO System. She was monitored regularly by the nursing team.

At D6, ~20% saturation of the dressing was observed. There was no sign of inflammation under the dressing. After a team discussion, a new PICO dressing (15cm x 30cm) was applied in order to avoid any risk of dehiscence in areas where the peri-wound skin was more fragile, which was distinguishable by a whitish discolouration. The surgeon decided to leave the PICO System in place for another 6 days.

Treatment outcome

The patient was seen again at D12. The PICO dressing showed 45% saturation, and the sutures at the ends of the incision line were removed. There was no sign of inflammation or dehiscence. The surgeon decided to continue PICO sNPWT for another 7 days, with the same dressing size (15cm x 30 cm).

PICO sNPWT was discontinued at D19. The dressing showed two stains, and all remaining sutures were removed. Antibiotic therapy was discontinued on the same day.

Note that the patient was able to receive physiotherapy throughout treatment with PICO sNPWT in order to regain the ability to walk unaided.

The total duration of treatment was 19 days. PICO sNPWT was then replaced by a hydrocellular dressing.

After completing the procedure and physiotherapy the patient was able to walk again.

The patient was pleased with the outcome and with the device, which helped prevent further complications and allowed her to resume physiotherapy sessions in order to regain mobility.

The surgeon was also pleased with the device.

Continued on next page
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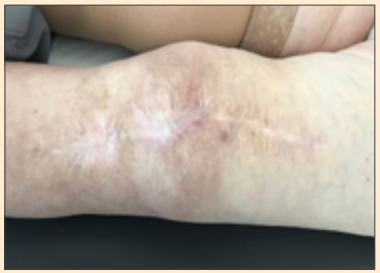
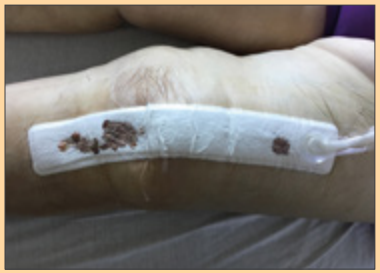
PICO◊ sNPWT on a surgical incision line after revision total knee arthroplasty

Dr Thomas Goetzmann - *Clinique Louis Pasteur, Essey les Nancy (France)*

Before surgery



Day 6



Day 12

Day 19

Day 47

Preventive use of PICO◊ sNPWT in amputation

Dr Mireia Sanz (Vascular Surgery), Dr Diego Sisa (Vascular Surgery), Mercè Centelles (Wound Care Nurse) - *Sant Joan de Martorell Hospital* (Barcelona - Spain)

Key points

Prophylactic use of PICO sNPWT helped reduce complications in patient with co-morbidities

3 weeks

Complete wound closure achieved within 3 weeks

No reported complications despite high risk of dehiscence and infection

Patient

- 58 year-old male patient
- Morbidly obese and diabetic with heart failure and renal insufficiency
- Sensorimotor polyneuropathy
- Long history of ulcers in both feet with superinfection

Treatment

- After several interventions involving attempts to dilate the posterior tibial artery and amputation of several toes, and given the worsening condition and poor prognosis, supracondylar amputation of the left leg was performed
- The stump was very thick and very swollen
- There were concerns that the surgical wound might open due to suture line tension

Follow-up/results

Two 10 x 30cm PICO dressings were used for 2 weeks, consolidating the suture perfectly without any complications.

Picture at application day

Picture at 3 weeks

Picture at 7 days

Using PICO◊ sNPWT on **open wounds** to help achieve wound healing or kick-start stalled wounds

The use of negative pressure wound therapy (NPWT), ACTICOAT◊ FLEX 3 Antimicrobial Barrier Dressing and IODOSORB◊ 0.9% Cadexomer Iodine Ointment to optimise wound healing for a patient with a dehisced surgical wound

Clare Wesley (Clinical Lead Nurse Tissue Viability) - *Shrewsbury and Telford Hospital (UK)*

Key points

Positive clinical outcomes using both traditional Negative Pressure Wound Therapy (tNPWT) and single use Negative Pressure Wound Therapy (sNPWT)

The patient was involved in his own self-care and worked with the tissue viability team to maximise the healing potential of the wound

Introduction

This case study follows the journey of a 56-year-old gentleman who underwent a subtotal colectomy with end ileostomy, this was emergency surgery for a perforated descending colonic tumour with caecel perforation.

Following surgery the patient would require chemotherapy and had a 13 week window to get his wound healed so this treatment could commence.

Case presentation

The patient is a 56 year old male who was admitted to hospital due to a perforated colonic tumour. The surgical wound on first review had clips in situ and measured from just below his sternum to below his umbilicus. There was an area on the patient's lower abdomen that had dehisced which measured 2cm x 2cm and probed to 4cm. The wound was being managed with a gelling, absorbent dressing and post-op wound dressing, interchanging with a wound management bag.

Due to the complexity of the wound the patient was referred to the tissue viability service for assessment. On initial examination the patient was pale, not eating well and very fatigued, he was frustrated with his wound and worried about going home and managing the fluid.

There was pooling of light brown exudate at the base of the wound (not faecal) and there was some evidence of healthy granulation tissue at the edges of wound, there were no overt signs of infection present.

The tissue viability team recommended PICO◊ 7 sNPWT to use with NPWT gauze wound filler in the first instance, this was unsuccessful as exudate levels were too high for the PICO 7 sNPWT to manage.

Therefore RENASYS◊ tNPWT was used with NPWT gauze filler and a pressure of -80mmHg. The nursing staff arranged an appointment at his practice nurse in 2 days' time for a change of dressing, the patient was then discharged home.

Wound challenges and management objectives

There were concerns on discharge regarding management of the wound with tNPWT. The clips were also due for removal but the practice nurse was not happy to remove these as there was a fear of further wound dehiscence.

The patient was admitted back to hospital as there were concerns the wound was leaking faecal fluid, there was also further dehiscence to the wound. The main treatment aims were to manage exudate and promote granulation, optimise diet/activity and to promote healing so that the patient could receive chemotherapy.

Treatment and outcomes

The patient has received various products throughout his treatment, initially PICO 7 sNPWT was used but was unable to cope with the exudate levels only lasting a day. It was then advised to use RENASYS tNPWT with a channel drain, after 2 days this was changed to a round drain to cope better with heavier amounts of exudate – this was used for 9 days.

The wound progressed well enough that treatment was changed to an NPWT gauze filler with RENASYS tNPWT – this continued with twice weekly changes for 12 days. After this the wound had healed enough and exudate had reduced to allow PICO 7 sNPWT. Due to anaerobes and the window for chemotherapy treatment time shortening, ACTICOAT FLEX 3 Dressing* with PICO 7 sNPWT was used for 2 weeks.

At this point all the wounds were closed apart from the bottom wound but this was also granulating up to surface level.

Once PICO 7 sNPWT had been discontinued (Day 43; Figure 6), IODOSORB Ointment was applied to the distal wound due to the clinician suspecting the presence of a biofilm. ALLEVYN◊ LIFE Foam Dressing was used as a secondary dressing. The wound was debrided during dressing changes to manage a portion of hypergranulation in the wound.

The patient was able to commence Chemotherapy whilst remaining under the Tissue Viability team for ongoing dressing changes.

Conclusions

The distal wound has been the most difficult wound to heal. This may be due to the fact that it was the deepest wound with tunneling in different directions. There was also a high bacterial load present.
The patient was involved with self-care of his wound, working with the tissue viability team to ensure optimal wound healing.

Continued on next page

1 2

*ACTICOAT FLEX 3 and FLEX 7 are only approved for use with NPWT for up to 3 days.

The use of negative pressure wound therapy (NPWT), ACTICOAT◊ FLEX 3 Antimicrobial Barrier Dressing and IODOSORB◊ 0.9% Cadexomer Iodine Ointment to optimise wound healing for a patient with a dehisced surgical wound

Clare Wesley (Clinical Lead Nurse Tissue Viability) - *Shrewsbury and Telford Hospital (UK)*

Figure 1
Day 1 -
Initial review by Tissue Viability Team

Figure 2
Day 8 -
Wound showing dehiscence following suture removal

Figure 3
Day 15 -
Wound showing progression after 9 days of RENASYS◊ tNPWT

Figure 4
Day 22 -
Wound showing signs of healing following use of RENASYS tNPWT

Figure 5
Day 26 -
Wound healing well following treatment with RENASYS tNPWT. PICO sNPWT and ACTICOAT FLEX 3 commenced on Day 29

Figure 6
Day 43 -
PICO sNPWT discontinued. Wound treated at this point with IODOSORB and ALLEVYN◊ LIFE

Results may vary

Treatment of a dehisced abdominal wound with IODOSORB◊ 0.9% Cadexomer Iodine Ointment, PICO◊ 7 Single Use Negative Pressure Wound Therapy (sNPWT) and ACTICOAT◊ FLEX 3 Antimicrobial Barrier Dressing to help facilitate wound healing

Pam Lloyd (Tissue Viability Nurse) - *Shropshire Community Health NHS Trust (UK)*

Key points

Use of advanced wound products helped prevent hospital admission

IODOSORB Ointment was used to de-slough the wound

The use of ACTICOAT FLEX 3 Dressing under PICO 7 sNPWT helped manage the wound infection

The author would like to thank Jacqui Hughes, Clinical Excellence Manager at Smith+Nephew for supporting the medical writing of this case study.

Introduction

This case study outlines the treatment and related outcomes for a patient with a dehisced abdominal wound following anterior resection of the bowel. The patient wanted to remain in the community so was reliant on the tissue viability team to recommend an effective treatment in order to a prevent hospital admission.

Case presentation

The patient was a 66-year-old male, who following an anterior resection of the bowel was referred to the tissue viability service with a dehisced surgical wound. The district nursing service was finding the care of this dehisced wound to be challenging due to high exudate levels. As a result the wound was showing signs of delayed healing. At this point, the wound was also infected with extended-spectrum beta-lactamase (ESBL)-producing bacteria.

Other than the presence of a diagnosed wound infection, the patient had no medical problems and was not receiving any medication that could impact on wound healing.

On initial assessment by the tissue viability team the wound measured 10.5cm (L) x 12cm (W) with 100% slough, and there were visible sutures in the wound bed (Figure 1). The patient was under the care of the colorectal consultant and following discussion it was decided that the sutures could be removed from the wound.

Wound challenges and management objectives

Management of the wound posed many challenges, which were mainly around high exudate levels. As a result, the district nursing team were visiting daily to change the wound care dressings.

Surgical debridement was ideally required for this wound due to the slough present in the wound bed. However, this would require hospital admission which the patient did not want. Treatment objectives therefore, were to manage the exudate levels and to debride the slough in the wound bed rather than surgical debridement.

Treatment

At the first assessment by the tissue viability team it was recommended to use IODOSORB Ointment to deslough the wound, this treatment would not only debride but would absorb exudate and provide an antimicrobial treatment. The dressing regime was to change the dressing every 72 hours in line with the instructions for use. IODOSORB Ointment was used for approximately four weeks until a significant amount of slough was removed in order to prepare the wound for PICO 7 sNPWT use.

Following debridement of the sloughy tissue the wound measured 9.5cm (W) x 10cm (L) with 90% granulation and 10% slough, PICO 7 sNPWT was applied to the wound which was changed twice a week (Figure 2). The wound was reviewed two weeks after PICO 7 sNPWT was commenced and the wound dimensions were, 7.5cm (W) x 7.5cm (L), with 100% granulation tissue. After one week of therapy, there was a noticeable malodour to the wound, with redness in the peri-wound area. ACTICOAT FLEX 3 Dressing was prescribed for use underneath PICO 7 sNPWT*. Dressings were changed every 3 days for the next two weeks.

PICO 7 sNPWT was continued for a further four weeks with wound reduction noted each week. PICO 7 sNPWT was then discontinued (Figure 3) and the wound was treated with a simple foam dressing until complete wound healing was achieved.

Discussion and conclusion

The wound responded well to the use of IODOSORB Ointment, ACTICOAT FLEX 3 Dressing and PICO 7 sNPWT. The patient tolerated all dressings and therapy used. He was also extremely happy that he was able to maintain an independent lifestyle with the dressing regime.

Although this wound took some time to heal and debridement was slower than it could have been if surgical debridement was performed, the patient experience was benefited by the fact that the patient was able to stay at home and still achieve full healing without a hospital admission or surgical intervention.

Figure 1
First assessment – Dehisced wound presented following anterior resection of the bowel. Wound measurements were 10.5cm (L) x 12cm (W) with 100% slough and visible sutures in the wound bed. The sutures were removed following discussion with the surgeon, and IODOSORB Ointment was applied to deslough the wound.

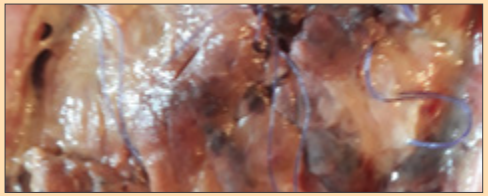


Figure 2
Day 33 - *Wound measurements 9.5cm (W) x 10cm (L) with 90% granulation and 10% slough. PICO 7 sNPWT commenced.*

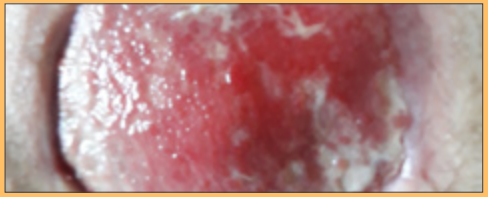


Figure 3
Day 89 - *Wound measurements were 5cm (W) x 4cm (L). PICO 7 sNPWT discontinued.*

*ACTICOAT FLEX 3 and FLEX 7 are only approved for use with NPWT for up to 3 days.

PICO◊ dressing applied on right transmetatarsal amputation

Dr Olivier Szymoniak - Vascular and Thoracic Surgery, Polyclinique de Cholet - *Cholet Polyclinic (Cholet, France)*

Key points

RENASYS◊ tNPWT was used in this case to contain the high level of exudate as well as promote granulation tissue healing

Patient was treated with PICO sNPWT after three weeks when the exudate level had dropped to manage wound, preserve peri-wound skin and promote independence

Strong case of OneNPWT helped improve outcomes and allowed patient return to their everyday lives

Patient

A 68 year-old female.

Patient admitted to the hospital for right transmetatarsal amputation.

The patient had untreatable proximal interphalangeal joint osteoarthritis, for which all treatment options had been exhausted.

- Cirrhosis secondary to past chronic alcoholism
- Peripheral artery disease of the lower extremities
- Type 1 diabetes

PICO sNPWT treatment methodology

The post-operative course was rather satisfactory.

However, removal of the skin sutures to limit the risk of necrosis led to dehiscence of the surgical wound.

It was therefore decided to apply a PICO System with a 10 x 30cm dressing.

At the time, the wound measured 7cm L x 3cm W x 1.5cm D, with an approximate surface area of 21 cm².

Course of PICO sNPWT

Given the large amount of exudate on day 7 and the impossibility to apply a larger PICO dressing due to the location of the wound, it was decided to switch to a RENASYS◊ tNPWT gauze dressing.

At this time, granulation was in progress and the wound was clean and healthy.

The NPWT dressing was changed every 72 hours after cleaning the wound with saline. Granulation tissue was gradually filling the wound cavity, which produced little wound exudate.

At D29 and after 3 weeks of RENASYS tNPWT, it was decided to continue this healing process with the PICO System.

The PICO dressing was changed twice per week.

The PICO dressing managed the volume of exudate and preserved the peri-wound skin.

The healing process was found to be continuous, with complete filling of the cavity by D42.

Treatment outcome

Progress was fast, with the cavity filled and the wound fully healed by D52.

The placement and size of the PICO dressing allowed optimal compliance by a patient who regained her independence very quickly.

Continued on next page

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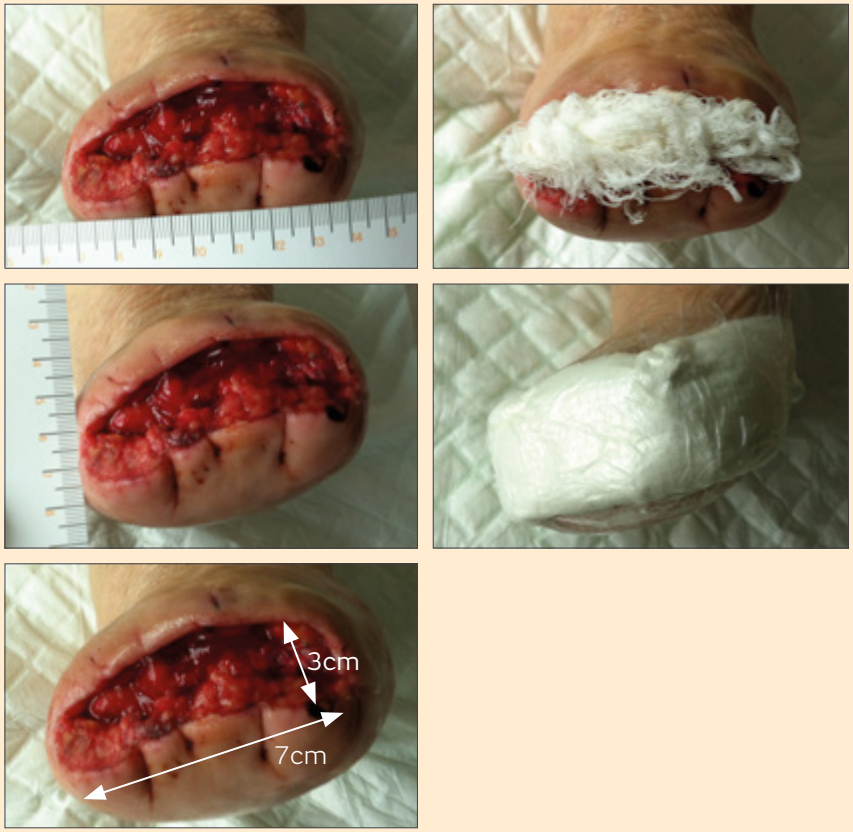
PICO◊ dressing applied on right transmetatarsal amputation

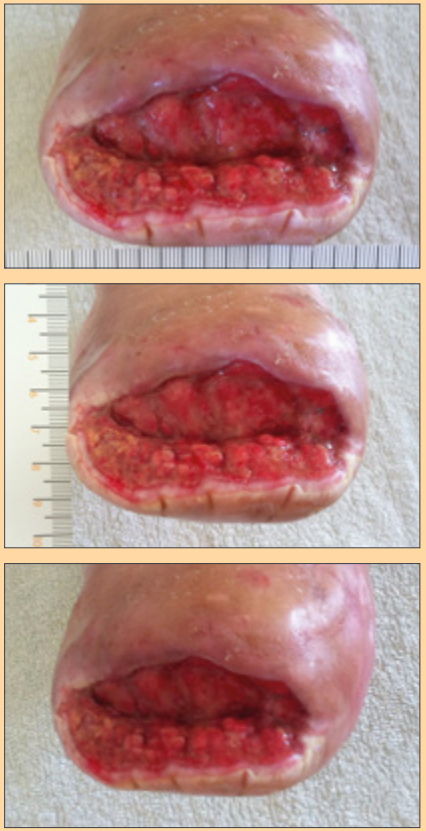
Dr Olivier Szymoniak - Vascular and Thoracic Surgery, Polyclinique de Cholet - *Cholet Polyclinic (Cholet, France)*

Day 0 with PICO sNPWT

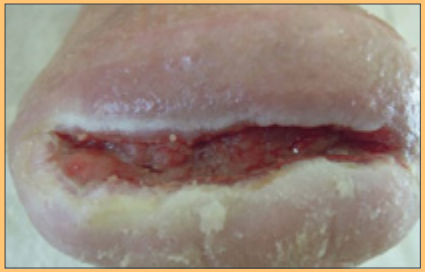
Day 29 after intervention



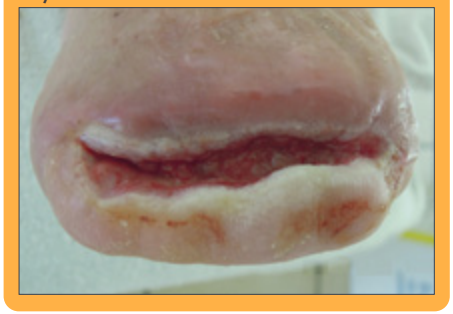
Day 7 with PICO sNPWT



Day 14



Day 19



Day 24

The use of PICO◊ 7 Single Use Negative Pressure Wound Therapy device (sNPWT) to kick-start healing for a chronic abdominal surgical wound following dehiscence

Laura Bushby (Tissue Viability Nurse Specialist) - *Northamptonshire Healthcare Foundation Trust (UK)*

Key points

The application of PICO 7 sNPWT helped kick-start stalled wound healing

Resulting in fewer dressings changes and reduced nursing visits when compared to the previous treatment method

PICO 7 sNPWT helped the patient return back to his social activities

Case presentation

The patient is a 47 year old male with no previous significant medical history, non-smoker and generally in good health. The patient was admitted to hospital due to acute appendicitis which resulted in emergency surgery. At 10 days post-surgery following removal of clips from the surgical incision, the wound dehisced due to a surgical site infection (SSI), the patient received oral antibiotics to treat the infection.

The wound was being dressed daily with Aquacel™ Extra, Biatain™ Non-adhesive foam and Hydrofilm™, this was being dressed by Practice Nurses (PN), the patient also attended weekend clinics to have the wound dressed due to the exudate levels. Due to the wound becoming problematic and non-healing the PN's referred the patient to the Tissue Viability Team (TV) for specialist assessment and also advice on treatment as they were unsure of what dressings to use.

On initial assessment by the TV team the wound was dehisced below the umbilicus on the abdomen, measurements were 3cm (L) x 1.5cm (W), with a depth of 1cm with undermining towards umbilicus of 2cm. The wound bed was clean with no signs of necrosis or slough, there were no clinical signs of infection.

Wound challenges and management objetives

There were high levels of exudate from the wound which proved to be difficult to manage due to exudate leaking out of the conventional dressing, this impacted on the patient's activity of daily living and social activities, this also resulted in the patient becoming depressed due to the impact the wound was having on his life.

The practice nursing team found the wound problematic and were trying to prevent the wound from becoming infected, after using dressings for a number of weeks they found that they were unable to recommend another treatment to help the wound to heal, they referred the patient to the tissue viability team for the specialist assessment and treatment.

Treatment

Following tissue viability assessment the wound was deemed to be suitable for NPWT. PICO 7 Single Use Negative Pressure Wound Therapy device (sNPWT) was recommended to be used on the wound with a Kerlix™ gauze filler due to the wound depth, and was changed twice weekly during the first week.
At the start of week 2 the wound depth and undermining was reduced so no wound packing was required. At the end of week 2 use of the PICO 7 System was discontinued due to wound dimensions being minimal and no longer requiring NPWT.
A conventional dressing was used for a further week, redressed twice weekly, which resulted in complete healing at the end of week 3.

Treatment outcome and results

At the start of NPWT the wound measured 3cm (L) x 1.5cm (W) with a depth of 1cm, the wound was undermining towards the umbilicus at 2cm, the wound surface area at this point was 3.3cm^2. After 1 week of PICO 7 sNPWT the wound measured 1.8cm (L) x 0.9cm (W), the undermining had reduced to 1.5cm, this resulting in a reduction in wound surface area to 1.4cm^2 and an overall wound healing reduction of 59%. After 2 weeks of PICO 7 sNPWT the wound measured 0.7cm (L) x 0.4cm (W) with an undermining of 0.9cm, at this point the wound had reduced in surface area to 0.3cm^2 and the overall wound healing reduction was 71% (from baseline), the wound then went on to receive standard therapy for a further week until complete wound healing was achieved.

Following assessment and recommendations from the tissue viability team it took the wound 3 weeks to achieve complete healing. Dressing use reduced from daily to twice weekly and the patient no longer needed to attend the practice daily or the weekend clinic for his dressing change, this resulting in a positive impact to his social and personal life.

Conclusions

The management of this wound was complex due to excess exudate levels, which was a contributing factor to delayed healing. By using PICO 7 sNPWT to kick-start stalled wound healing, this resulted in fewer dressing changes and reduced nursing visits. This resulted in a positive impact on the patient's well-being and enabled the patient to regain his independence and return back to his social activities.

Continued on next page

1 2

Note: PICO 7 Single Use Negative Pressure Wound Therapy is indicated for patients who would benefit from a suction device (NPWT) as it may promote wound healing via removal of low to moderate levels of exudate and infectious materials.

The use of PICO◊ 7 Single Use Negative Pressure Wound Therapy device (sNPWT) to kick-start healing for a chronic abdominal surgical wound following dehiscence

Laura Bushby (Tissue Viability Nurse Specialist) - *Northamptonshire Healthcare Foundation Trust (UK)*

Figure 1
Taken at initial tissue viability assessment

Figure 2
Wound following 1 week of treatment with PICO 7 sNPWT

Figure 3
Wound following 2 weeks of treatment with PICO 7 sNPWT, therapy was discontinued at this point and conventional dressing applied for a further week until complete healing

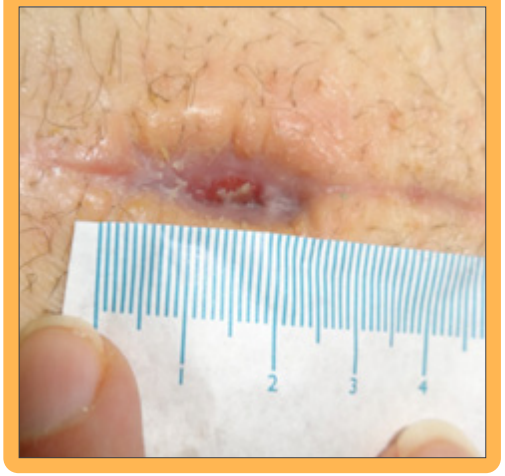
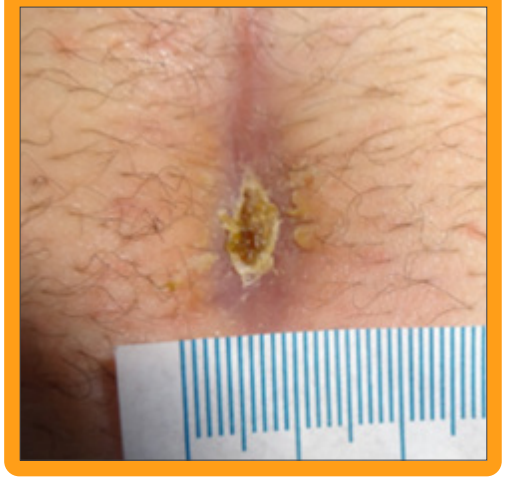


Figure 4
Wound healed with dry scab intact, patient discharged from care of Practice Nurses



Individual results will vary

Using PICO◊ 14 sNPWT on a chronic complex pressure injury

Chloe Jansz (Nurse Practitioner/CDE, Nursing Service Director) - *Healthcare United (Victoria - Australia)*

Key points

Use of PICO sNPWT helped kick-start the wound into healing

5 days

Nurse time and costs were saved by reducing dressings changes from twice a day to once every 5 days

The reduction in dressing changes also helped Mrs P regain her independance

Introduction

Mrs P has a non-migrating sacral wound post indwelling catheter insertion (IDC), in which she created a pressure injury in hospital over four years ago, post her gangrene surgical debridement (Fournier) requiring IV antibiotics and hyperbaric treatment. Post hospital admission she was transferred into aged care four years ago, and due to faecal incontinence and loss of sensation Mrs P is unable to feel pain or wound deterioration. In addition to this, the aged care staff have been unable to completely seal a conventional dressings.

Mrs P is fiercely independent, and still likes to toilet herself despite her incontinence and frequent IDC bypassing. Unfortunately Mrs P often has her conventional dressing wrapped up in her toilet paper due to proximity of the wound.

Case presentation

- Patient profile (female, 79 years old)
- Medical history (existing medical condition)
  - Fournier gangrene (IVs and Hyperbaric in past), Neurogenic bladder, COPD,HT, T2DM, conus lipoma, cauda equine, PE, VRE, Bilateral hernia
- Current health status of patient
  - Right lower thigh, buttock wound, originally 4cm length diameter)– 5cm sinus
- Previous treatment of wound
  - Antimicrobial pack with super absorbent dressing 1-2 times a day, due to toileting regime
- Summary
  - Mrs P has a combination of granulation (90%) and slough (10%) tissue viability, exudate is not managed being too wet, causing the peri wound to be constantly macerated, the cavity wound however is within a balanced wound bed preparation. Her cavity is 5cm deep in the crease of the gluteus maximus join, and is not hitting or evident to visible vital structures

Wound challenges and management objetives

- The initial challenges that lead Mrs P to NPWT were that she had tried everything over the last 4 years, antimicrobials, silvers, antifungal ointments, honey, and a multitude of silicone and superabsorbent dressings. The primary intention that all the dressings lacked was the ability to stay sealed and within the test of 12 hours, as the wound is approximately 4cm from the anus opening.
- For Mrs P, having her wound dressing attended to twice a day, meant that she had no independence to go very far or travel out of the facility even though she was completely independent and mobile with her 4 wheel walking frame. She also reported “people know more about my bottom than me” (personally).
- The clinical impact of the wound is that it had not got any bigger over the course of seeing Mrs P (3 months) however it also had not migrated. The peri wound maceration is slowly producing an odour, and contamination to the wound and risk of infection is inevitable, along with the risk of vital structure contamination, such as osteomyelitis.
- For Mrs P, she required a dressing that would literally give her life back, would enable her to not have dressing changes daily, that nurses would come in and ask her how she is and not how her bottom was. She needed a seal that wound protect her from incontinence, and a device/dressing what would fill in the dead space of her cavity.
- Objectives:
  - A dressing that sealed, provided 1-2 days without dressing change required, filled in dead space of cavity, maintain wound bed preparation
  - Reduced cavity size and peri wound maceration
  - Goal was Mon, Wed, Fri changes
  - To review for 2-4 weeks if there is any change to the wound bed

Treatment

- NPWT in aged care is often difficult with alarms and cords that are falls risk, and inadvertently makes the resident’s anxious if the battery will run out, and therefore the resident continues to be isolated to a location close to a power point.
- Barriers to care have been due to the demands of aged care, especially in a COVID environment, and the skill mix, NPWT is required to have an easy application, as often if unable to be troubleshot the staff will take it off and revert back to conventional dressings.
- Therefore, the clinician chose PICO 14 sNPWT, a battery powered, no alarm NPWT that gave -80mmHg, to assist with cavity migration. A seal while challenging regarding the location of the wound, was able to be maintained, using a black granulation foam filler to eliminate the dead space. The dressing could last for 1 week, while the PICO 14 sNPWT device could last for 2 weeks.
- Over the course of the study, Mrs P was so thankful that instead of the goal of change Mon, Wed, Fri it lasts 5 days, before the alarm button stating the dressing was full came on. While Mrs P was brought to tears with her new found freedom of independence

Treatment outcome and results

- As above, it was evident that NPWT stimulated what Mrs P required, to start her wound migrating again, and to step into the proliferation phase of wound healing. In the time of the study (24 days- 2 PICOs) Mrs P’s wound went from 4 cm length to 2.5cm and 5cm cavity to 2cm.
- Mrs P regained her independence, and regained her ability to have her healthcare be about her whole body, not the hole in her body. Vital structures were protected, and migration of the wound base is now evident.
- NWPT allowed staff time to de drastically reduced from 2 visits of 30-40 minutes per day to one 40min change every 5 days. The staff and clinician taught Mrs P the codes and how to manage “pressing the orange button” herself, so she regained independence in feeling the vibration and knowing the NPWT was working despite not feeling it, which was the issue of her not realising a conventional wound dressing was in situ in the past. It also reduced the cost of conventional wound dressings that were totaling $10 per change, not equating nurses time or wages.

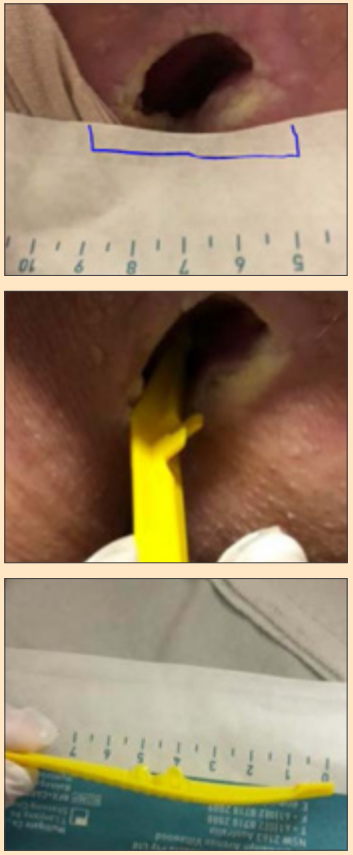
Continued on next page

Using PICO◊ 14 sNPWT on a chronic complex pressure injury

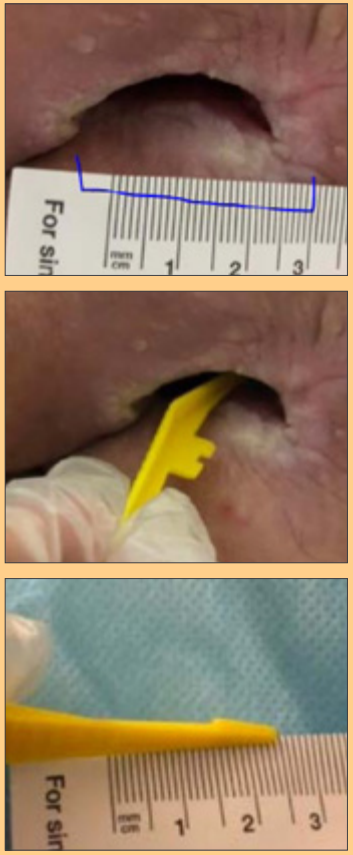
Chloe Jansz (Nurse Practitioner/CDE, Nursing Service Director) - *Healthcare United (Victoria - Australia)*

Discussion and conclusions

- For Mrs P the significance of NPWT was that her wound has now kick started again. There was no cavity migration despite all other wound tricks and tips in the last 4 years, and since she achieved a cavity reduction of 3cm in 24 days, almost 1cm a week!
- Due to the reduction in size, the wound is now easier to manage as it has migrated away from the anus so securing the wound dressing has become easier.
- Mrs P now realises the importance of other wound care factors such as pressure injury protection and is now actively using her ROHO, she requests the staff check what dial her air mattress is on, and she is actively getting up and moving around for a few minutes at least every hour to reduce pressure risks, as COVID has hit and residents have the new found challenge of being secluded to their rooms.
- PICO 14 sNPWT surprised the clinician in the amount of migration that was able to be achieved in such a short amount of time. The ease of dressing application and drape application, despite being in full PPE because of COVID, was surprising that the technology did not excessively stick to gloves and become tangled and not usable. The ease of teaching the resident how to self-manage the device was rewarding. Along with the pocket holder for the device that was included in the pack was genius, as adherence, and making sure the device does not accidently get pulled off was a vital component.
- In conclusion the claims that Smith+Nephew portrayed in their evidence regarding PICO 14 sNPWT were seen, in an aged care setting, during COVID times, truly impressive!

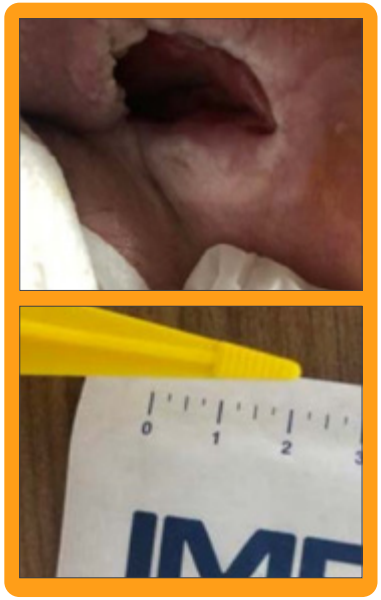


Patient's wound was 4cm length diameter with 5cm sinus



7 days later

5 days



Use of PICO◊ 14 sNPWT on a chronic heel pressure injury in aged care facility

Ashleigh Nichols (Wound Consultant) - *Healthcare United (Victoria - Australia)*

Key points

4 week

The wound improved over 4 week application - the wound had decreased in width and length by 1cm as well as depth by 0.5cm

Nurse time and costs were saved due to reduced dressing changes needed

The patient was able to increase her mobility, return to wearing regular footwear, which boosted her mood and confidence

Introduction

The patient is a 95 year old woman, currently residing in a residential aged care facility. The patient sustained a fractured neck of femur (NOF) requiring surgery, during her inpatient stay she sustained bilateral stage 3 pressure injuries to her heels. The facility reported that initially the wounds were necrotic. The decision was made to commence the PICO 14 sNPWT trial to the left heel as it was the worst out of the bilateral wounds.

Case presentation

- 95 year old Female living in residential aged care facility
- Medical history: Anxiety, Anaemia, Hyperthyroidism, Glaucoma, Deafness/hearing loss, Hypertension (high blood pressure), Asthma, Osteoporosis, Nephritis renal failure, Fractured neck of femur, Pain, Urinary incontinence, Falls (frequent with unknown aetiology), Short term memory loss, venous insufficiency
- Current health status of patient
  - The wound in which the PICO 14 sNPWT was trialed on is a stage 3 pressure injury on the left heel. The initial size of the wound was 3cm (L) x 1.5cm (W) x 0.5mm (D)
- Previous treatment of wound
  - Prior to the facility referring the patient to Healthcare United they were dressing the wound with silicone foam, the wound was not responding to this treatment. The wound and periwound was macerated and the patient had ongoing complaints of pain to both heels.
  - The wound was initially reviewed by Healthcare United, the wound was macerated with a purulent exudate indicating a heavy biofilm to the wound. The wound was previously managed with a combination of Povidone Iodine, alginate and foam dressings.
  - The previous dressing was successful in managing the bioburden however it was not sufficiently controlling the maceration. The PICO 14 sNPWT trial commenced.

Wound challenges and management objetives

- The patient had a duplex scan completed and significant venous insufficiency was found, this impacted on the ability to use compression to assist in the healing of the wound.
- Despite extensive education on the impact of showering unassisted on the wound healing, the patient continued to shower unassisted. This was impacting the wound as she was saturating the wound dressing and causing maceration. As a result of the now sedentary lifestyle she leads, her Lean Body Mass has reduced. She has reduced endurance and this weighs heavily on her mind which impacts on her anxiety and depression.
- The patient has required more nursing interventions due to the increased pain resulting from the wounds, she has become reliant on opioids to sleep at night. The wound was being dressed three times a week,
- The long term nature of this wound has impacted the patients psychosocial wellbeing due to the social isolation secondary to pain, wound malodour and difficulty mobilising. The physical wellbeing of the patient has also been impacted. Previously the patient was able to mobilise with a 4 wheeled frame and little assistance, now she requires a wheelchair for long distances. Due to the physical decline the patient is experiencing, her anxiety and depression has been impacted.

Treatment

- The PICO 14 sNPWT trial was well received by the patient. The only complication to come of the trial was a small wound was created by the connections, this was easily rectified by placing a gauze around the connection to protect the skin.
- The PICO 14 sNPWT was applied for 4 consecutive weeks to the left heel. The initial week the wound was packed with the supplied sterile foam, however the following 3 weeks did not require a packing foam. The dressing was left intact for 7 days and as a result 4 dressings and 2 pumps were used in total. During the second week due to a delay in receiving the second pump the wound was dressed with an alginate and foam dressings for 2 days which caused a small amount of deterioration.

Treatment outcome and results

- The wound showed significant improvement over the 4 week application. The maceration was controlled to the periwound. The wound edges had begun to have the maceration controlled and the wound bed depth had decreased. The wound had decreased in length by 1cm, width by 1cm and depth by 0.5cm.
- The patient's pain was controlled, she was able to increase her mobility and by the end of the trial was able to mobilise with her 4 wheel walker to the treatment room. The patient was also able to return to wearing regular footwear, this boosted her mood significantly. The patient's anxiety was greatly reduced as she became more confident that her wound may heal.
- The wound was only required to be dressed 1 x per week in comparison to 3 x weekly, this reduced procedure costs and reduced nursing hours. The wound required less nursing attention and the patient felt empowered as she was able to monitor the pump and have an input into her wound management.

Discussion and conclusions

- The wound significantly decreased in size, the patients quality of life was improved and the product worked so well for the patient that we have since continued with PICO 14 sNPWT bilaterally to both heel pressure injuries.
- In the 4 weeks using PICO 14 sNPWT on a chronic pressure injury, the wound decreased by 1cm x 1cm x 0.5cm, the patients overall psychosocial and physical wellbeing was improved and the burden on the nursing staff was reduced.
- *"The PICO 14 sNPWT trial was so successful we continued the PICO 14 sNPWT bilaterally in the hopes to continue to improve the patients quality of life."*
  "I am excited to be able to provide portable and affordable negative pressure dressings to residents living in residential aged care."

Continued on next page

1 2

Use of PICO◊ 14 sNPWT on a chronic heel pressure injury in aged care facility

Ashleigh Nichols (Wound Consultant) - *Healthcare United (Victoria - Australia)*

Figure 1
Day 1 -
Pressure injury to heel wound at initial application

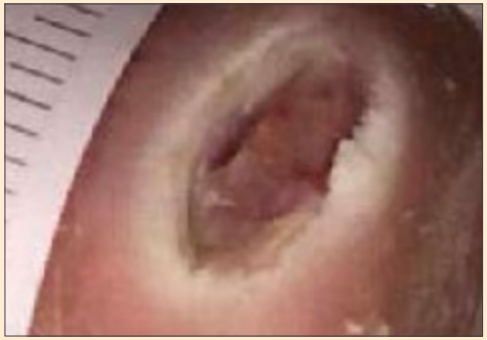


Figure 2
Day 7 -
Pressure injury to heel wound at first dressing change

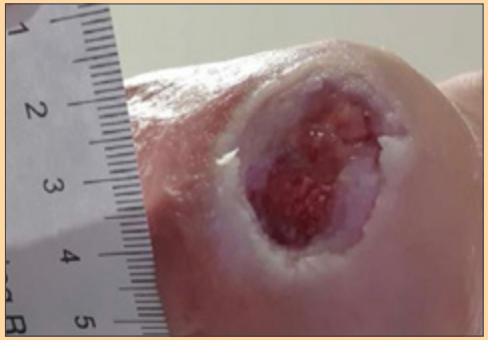


Figure 3
Day 15 -
Pressure injury to heel wound at second dressing removal

Figure 4
Day 17 -
Pressure injury to heel wound at the third dressing application

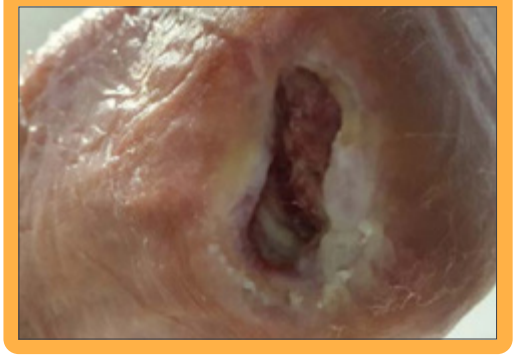


Figure 5
Day 17 -
Pressure injury to heel wound at the third dressing application

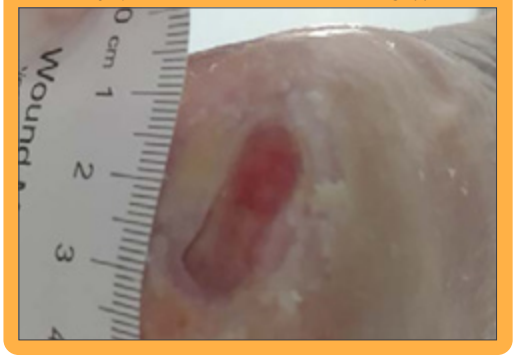
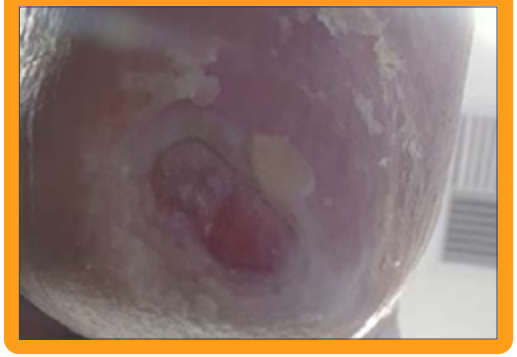


Figure 6
Day 31 -
Pressure injury to heel wound at the fourth dressing removal



Use of PICO◊ sNPWT on complex soft tissue injuries

Sonia Almansa Saura (RN), Inmaculada Romero Sánchez (RN), Mónica Rodríguez Valiente (RN), Patricio Alcaraz Lorente (Specialist Physician), Teresa Soria Cogollos (Specialist Physician), Gregorio Castellanos Escrig (Head of Department) - *Diabetic Foot and Wound Healing Unit; Department of General and Surgery and Gastroenterology. Virgen Arrixaca Clinical University Hospital (Murcia - Spain)*

Key points

The use of PICO sNPWT helps promote growth of granulation tissue and skin epithelisation

PICO sNPWT facilitated the use of open-heel walking boot, which helped patient initiate rehab early, promotes mobility

The use of PICO sNPWT device proved satisfactory in this case

Patient

A 51-year-old man with no relevant medical history who suffered a traffic accident resulting in left ankle fracture and an open traumatic heel wound.

Treatment

He underwent an emergency trauma procedure with fracture repair by open reduction and internal fixation with osteosynthesis and percutaneous K-wire fixation of the distal phalanx. The heel wound was sutured and the foot placed in a plaster cast for immobilisation (Figure 1). After 15 days, the cast was removed, revealing extensive dry necrosis of the skin on the entire postero-lateral side of the ankle/heel with a small amount of exudate (Figure 2). The patient was referred to his local Health Centre for moist wound healing with collagenase.

Due to slow wound healing, on Day 39 he visited the Wound and Diabetic Foot Unit of Virgen de la Arrixaca Clinical University Hospital. Inspection of the wound revealed significant soft tissue loss with signs of local inflammatory, oedema, exudate, sloughing and dermal necrosis (Figure 3). The wound exudate was cultured, resulting in the isolation of Klebsiella oxytoca and Enterobacter cloacae, both of which were sensitive to ciprofloxacin which was prescribed at a dose of 600mg every 12 hours (Table 1). Extensive exeresis and debridement of the devitalised tissues was performed (Figure 4) with collagenase wound dressings every 48 hours.

After one week, granulation tissue had developed in the wound (Figure 5) and the wound bed was covered with ACTICOAT◊ FLEX 3 Antimicrobial Barrier Dressing (Figure 6).* To achieve granulation of the wound bed, a PICO Single Use Negative Pressure Wound device (-80 mm Hg) was used with a 15 x 30cm dressing sealed on all sides (Figure 7).

To allow the patient to walk while relieving pressure on the affected area, the patient was fitted with an open-heel Optima walking boot (Figure 8).

Results

Granulation tissue formation and wound contraction observed after 14 days of use of the PICO System (Figure 9, Graphic 1).

At 21 days, complete granulation of the soft tissue deficit was observed, so that the single use NPWT system was removed. The wound was then epithelialised using cell therapy, by weekly placement of an amniotic membrane (AM) in contact with the granulated wound bed for 14 weeks (Figure 10) until complete epithelisation was achieved (Figures 11-12).

The patient attended ankle rehabilitation sessions throughout the wound healing process and recovered full function.

Conclusions

The use of the PICO sNPWT System in our department allowed to achieve full granulation of this complex soft tissue wound. It also prepared the wound bed for epithelisation using cell therapy.

Table 1

	Day 4	Day 11	Day 46	Day 56
Klebsiella oxytoca (Ampicillin resistant)	■	■	■	■
Enterobacter cloacae complex: (treatment with 3rd generation cephalosporins - resistant to beta-lactam antibiotics)			■	■
Enterococcus faecalis (Cefuroxime-resistant)	■	■	■	■

Continued on next page
1 2

*The ACTICOAT FLEX range may be used in combination with PICO sNPWT for up to 3 days.

Use of PICO◊ sNPWT on complex soft tissue injuries

Sonia Almansa Saura (RN), Inmaculada Romero Sánchez (RN), Mónica Rodríguez Valiente (RN), Patricio Alcaraz Lorente (Specialist Physician), Teresa Soria Cogollos (Specialist Physician), Gregorio Castellanos Escrig (Head of Department) - *Diabetic Foot and Wound Healing Unit; Department of General and Surgery and Gastroenterology. Virgen Arrixaca Clinical University Hospital (Murcia - Spain)*

Figure 1
Post surgery
Start

Figure 2
15 days post surgery

Figure 3
39 days post surgery

Figure 4

Figure 5
Day 0 PICO sNPWT therapy

Figure 6

Figure 7

Figure 8

Figure 9
Day 14 PICO sNPWT therapy

Figure 10
Week 14 post surgery

Figure 11
Week 25 post surgery

Figure 12

The use of PICO◊ 14 Single Use Negative Pressure Wound Therapy device (sNPWT) to manage a dehisced abdominal surgical wound

Helen Meagher (RANP Tissue Viability) , Jean Sheehan (CNS Tissue Viability)- *University Hospital Limerick (Munster - Republic of Ireland)*

Key points

Successful outcome of PICO 14 sNPWT as part of the holistic management of a patient with surgical site complication

Resulted in fewer dressings changes and reduced clinic visits when compared to the previous treatment method

Patient found the dressing comfortable to wear

Case presentation

The patient was a male who underwent incisional hernia repair. Following this there was a transverse abdominal wound dehiscence post removal of clips on day 10. This was also secondary to a haematoma that had collected around the wound site.

Wound challenges and management objetives

The wound posed many challenges for the public health nurse (PHN), the main clinical impacts being around the risk of the mesh inserted during the hernia repair failing. There were also concerns around exudate management and the further risk of an infection which could lead to further complications for the patient. The patient was extremely anxious and was feeling some discomfort from the wound which led to a negative impact on his day to day life as he was in pain and was self-conscious about the wound leaking onto his clothes.

Treatment

The patient was being treated by the PHN with the support of the tissue viability (TV) team due to the wound being problematic, the wound was being managed with a Hydrofiber™ dressing to pack the wound and an absorbent pad and adhesive dressing to cover, this was being changed three times per week.

Following assessment by the TV team the wound was deemed to be suitable for NPWT, it was decided that PICO 14 sNPWT would be used, this is an enhanced pump* to aid use in larger wounds with less user intervention1, due to the pump duration of up to 14 days.[1,2]

Treatment outcome and results

Prior to application of PICO 14 Single Use Negative Pressure Wound Therapy (sNPWT) the wound measured 8cm (W) x 2.5cm (L) x 1cm (D), there was also undermining 1cm at 12o'clock (wound surface area = 16.3cm^2). The wound bed was clean with subcutaneous tissue throughout, there was moderate haemoserous exudate and the wound edges were healthy (Figure 1).

Due to the concerns over wound infection causing the dehiscence and this leading to wound complications, the wound was dressed with ACTICOAT◊ FLEX 3 Antimicrobial Barrier Dressing† to loosely fill the cavity and undermining, PICO 14 sNPWT was then applied, this was changed twice weekly for 2 weeks, PICO 14 sNPWT was applied for a further 2 weeks.

The patient found the dressing comfortable to wear and was confident managing the device between dressing changes, he also reported no issues with the seal or with managing the device.

Following 4 weeks treatment with PICO 14 sNPWT the wound had fully healed, the patient was discharged from the PHN and also the TV service.

Conclusions

This case study describes a successful outcome using PICO 14 sNPWT as part of the holistic management of a patient with a surgical site complication. By using PICO 14 sNPWT to promote wound healing, this resulted in fewer dressing changes, reduced clinic visits and product costs.

Figure 1
Wound image prior to application of PICO 14 sNPWT

Figure 2
Wound following 2 weeks treatment of PICO 14 sNPWT

Figure 3
Wound healed following PICO 14 sNPWT after 4 weeks

Individual results will vary

*When compared to previous PICO sNPWT models. †ACTICOAT FLEX 3 and FLEX 7 are only approved for use with NPWT for up to 3 days.

1. Smith+Nephew 2019. Research & Development Report. PICO 14 and PICO 7 Initial Pump Down and Maintenance Pump Down Time Outs RD/19/084. **2.** Smith+Nephew December 2018. PICO 14 Service Life Testing: 14 Day Device Lifespan. Internal report. RD/18/132.

Use of PICO◊ 7 sNPWT in the community – A hospital in the home patient

Jennifer Garrett - *Wound Care Clinical Nurse (Australia)*

Key points

As a result of the application of PICO 7 sNPWT, the patient was discharged earlier from the acute care setting

This resulted in a reduced cost of dressings and changes

PICO 7 sNPWT helped the patient return back to his social activities

Introduction

Negative Pressure Wound Therapy (NPWT) has not been utilised as much in the community for Hospital in the Home (HITH) patients as it has been in the acute settings. An increasing number of patients have been identified who do not need acute care, but may be suitable for single use NPWT. A simpler, more convenient device was required which was easy to use for the community staff who were undertaking the dressing changes. PICO 7 single use Negative Pressure wound therapy was utilised in this instance.

Case presentation

Mr T is an 83 year old male he has had left sided hemiplegia for approximately 20 years. He sustained a large laceration to his left forearm at home from a mechanical fall when he was trying to sit on a chair.

Current health status of patient

The wound was washed out and sutured at a regional hospital with the doctor noting considerable dead space in the forearm and a large haematoma. The arm was placed in a pressure dressing. His haemaglobin dropped to 88, 2 days after admission and transfusion of 1 unit of Packed Red Blood Cells was administered. His haemaglobin rose to 101. 20ml of altered blood was aspirated from the wound and the arm was again placed in a pressure dressing.

Previous treatment of wound

Mr T was admitted to hospital for possible Left forearm wound infection and wound care and was commenced on oral Cephalexin 500mg 6 hourly. A wound swab undertaken (Figure 1) indicated a heavy growth of Pseudomonas aeruginosa and a light growth of *Peptostreptococcus* species.

Since arrival at hospital, the wound dressing included an application of gauze soaked with PHMB surfactant wound irrigation solution for 10-15min, application of PHMB wound gel and simple non-adhesive dressings for exudate management. Bactigras (chlorhexidine-impregnated parrafin gauze) was added to this regime.

The Wound Specialist Service received a referral. An appointment was scheduled to review Mr T. On removal of the dressing there was a substantial amount of sanguineous exudate that flowed freely from the wound – this was a devolving haematoma. The flap had become necrotic and conservative sharp wound debridement was conducted to remove the necrotic tissue . Following debridement blood clots and further necrotic tissue underneath the flap was revealed. The wound extended in all directions for approximately 3cm of undermining. Bone could not be felt within the wound bed.

Referral was made to the in house dietitian for nutritional assessment. Mr T was referred to the Physiotherapist regarding his mobility prior to discharge. Following debridement, Mr T's doctor suggested a review by a Plastic surgeon. (Figure 2). Until review, Mr T had PHMB irrigation wound solution soaked gauze applied to the wound and changed daily to help facilitate cleaning of the clots, necrotic tissue and try to reduce the bioburden further.

Review of Mr T by the Plastic Surgeon and requested twice daily PHMB wound solution soaked gauze to try to clean up the wound further and a comprehensive work up for a possible skin graft. Mr T also commenced Ciprofloxacin 500mg BD.

An incidental finding of a false aneurysm was noted on his brachial artery of approximately 21mm x 13mm and review by a Vascular Surgeon was conducted. Along with the brachial artery false aneurysm there was a possible further haematoma of 14cm x 1.4cm x 5.9cm in the soft tissue of his left upper medial arm.

About a month later, the wound was reviewed and it was noted that significant healing had occured (Figure 3). It was determined that NPWT could be an option, should the wound not be suitable for grafting. A decision to cancel the surgery was made due to the false aneurysm. Twice daily PHMB wound irrigation solution soaked gauze continued as per the Plastic Surgeons orders until Mr T could be reviewed again by the Wound Service.

Due to his left sided deficiency, Mr T required a portable, lightweight, easily managed device and it was decided that a PICO 7 System could be utilised. The wound was approximatley 1cm at the deepest point with no significant undermining.

Wound challenges and management objectives

Infection and undermining were challenges for this wound however, these were managed with oral antibiotics, antimicrobial cleansing and dressings and the use of compression around the forearm. This reduced the bioburden and undermining significantly.

Despite his advancing age and hemiplegia, Mr T was still living independently as much as he could at home with his wife. It was around Christmas time and Mr T wanted to be out of hospital during this time. Use of the PICO 7 sNPWT allowed Mr T to be transferred to a respite centre which was closer to his home. He undertook day leave on Christmas day to be with his family.

There was no acute reason for Mr T to be in hospital. Using the PICO 7 sNPWT allowed the dressings to be undertaken in the community. Mr T required a device that was extremely portable which would not impede his movement. The PICO 7 sNPWT allowed NPWT to be administered and did not impede his activity of daily living (ADLs).

Objectives included to: Apply a device which was portable, easy to apply, easy to educate other HCP, showed healing, was able to be changed twice weekly and for healing to occur in a timely manner.

Treatment and wound images during treatment in next page

1 2

Use of PICO◊ 7 sNPWT in the community – A hospital in the home patient

Jennifer Garrett - *Wound Care Clinical Nurse (Australia)*

Treatment

NPWT in the form of a PICO 7 sNPWT was utilised. Mr T was to transfer to an external respite centre under the Hospital in the Home program and to continue with twice weekly dressing changes (Mondays & at the Respite Centre with the PICO 7 sNPWT (Figure 5 and 6). The PICO 7 sNPWT was removed and a simple silicone dressing placed on the wound. Mr T attended the Wound Specialist Service early in the year 2020 with a healed wound.

The external provider sent a HCP to the hospital for education on wound dressing changes. A written plan was provided to the HCP.

PICO 7 sNPWT was used for about a month. Photos and reports were sent to the hospital from the respite centre at every dressing change and measurements taken on photos that were appropriate to measure. (Figure 7-9).

Four PICO 7 sNPWT's were used which included the 8 dressings.

Treatment outcome and results

- There was a reduction in size from 5.25cm^2 to 1.86cm^2 over the 4 weeks with the use of the PICO 7 Single Use Negative Pressure Wound Therapy.
- Complete epithelisation occurred in the next two weeks.
- There was also a reduction in depth of approximately 1.5cm to skin depth and undermining decreased from approximately 3cm around the wound to no undermining. (Figure 10).

Conclusions

- It was Christmas and Mr T wanted to get home as soon as possible. After living with hemipleagia since 1997 he was determined that this was not going to set him back.
- Epithelisation occurred in 2 months from a necrotic flap with significant dissolved haematoma with the use of a PICO 7 sNPWT for 4 weeks.
- There was earlier discharge of the patient from the acute care setting to a respite centre.
- There was reduced cost of dressings and changes.

Figure 1
22nd November 2019 -
Left forearm wound prior to debridement

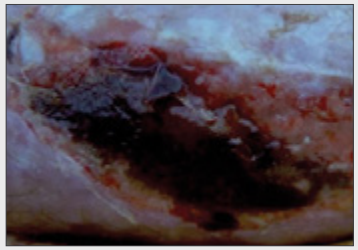


Figure 2
27th November 2019 -
1 day post conservative sharp wound debridement

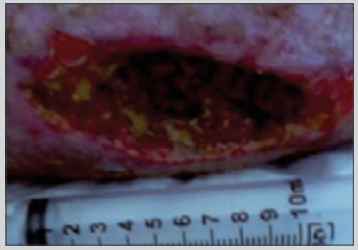


Figure 3
2nd December 2019 -
Review whilst under the care of a Plastic Surgeon

Figure 4
9th December 2019 -
Day 1 with PICO 7 sNPWT

Figure 5
Day 4 with PICO 7 sNPWT -
Respite centre staff in attendance to learn how to apply the PICO 7 Dressing

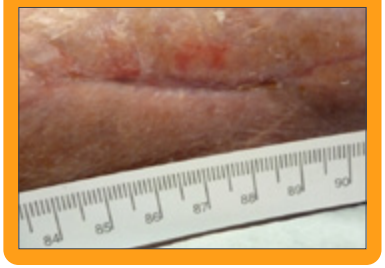
Figure 6
16th December 2019 -
Day 8 with PICO 7 sNPWT -
At the respite centre

Figure 7
19th December 2019 -
Day 11 with PICO 7 sNPWT

Figure 8
23rd December 2019 -
Day 15 with PICO 7 sNPWT

Figure 9
3rd January 2020 -
Day 26 with PICO 7 sNPWT

Figure 10
22 January 2020 -
Healed wound



PICO◊ sNPWT on an infant with an extravasion injury

Gemma Pérez (Nurse) - *Sant Joan de Déu Hospital (Barcelona - Spain)*

Key points

PICO sNPWT was used to help stimulate granulation tissue, wound shrinkage and reduce scarring

The PICO Dressing has a gentle silicone adhesive which helps minimise trauma and pain to the peri-wound area on dressing removal[1–3]

The use of both PICO sNPWT and ALLEVYN◊ Dressings in this treatment regime optimised nursing care with a fully satisfactory outcome in a situation that could have had a long evolution

Introduction

Extravasation injuries (EXINJ) are defined as tissue damage due to perivascular efflux of a vesicant solution which can progress to necrosis. In paediatrics, the incidence of EXINJ unrelated to chemotherapy ranges from 11% to 58%. Nursing care of EXINJ is aimed at optimising early resolution,1 reducing complications and improving the quality of life of patients. The severity of necrosis depends on the duration of extravasation and on the volume and type of vesicant solution. This is due to the vesicant exerts toxic effects on the tissues exposed whilst the solution is active. Advanced care of EXINJ with negative pressure wound therapy (NPWT) and moist wound healing (MWH) products is an option that allows to optimise treatment, shorten the clinical course and decrease the potential for complications or sequelae compared to traditional wound dressings.*

Patient

A three-month old baby girl with oesophageal atresia admitted to a paediatric intensive care unit (PICU) due to respiratory difficulties, requiring NPO, ventilatory support and fluid replacement therapy administered via a peripheral vein. After 12 hours of fluid therapy, the right upper extremity was found to be very swollen, hard and pale. The line was checked for leaks, and after confirming that there were none, the infusion was stopped and the catheter removed. The back of the hand showed necrosis the depth of which could not yet be determined.

Treatment

As an initial treatment option, it was decided to reduce the swelling with compresses of Burow's solution and elevation of the limb. Daily enzymatic debridement of the necrotic area was then initiated in combination with sharp debridement in subsequent sessions, and using a polymer foam as a secondary dressing. On the third day, it was decided to consult a traumatologist to rule out the possibility of tendon involvement. Once tendon necrosis was ruled out and during ongoing debridement of the wound, it was decided to start treatment with PICO sNPWT to stimulate mechanical debridement, the formation of granulation tissue, wound shrinkage and scarring.

Follow-up/results

As can be seen in the picture sequence, satisfactory wound healing was achieved in 42 days, after 13 dressing treatments (2 PICO and 11 ALLEVYN◊ Dressing).

Conclusions

The treatment regime used allowed to optimise nursing care with a fully satisfactory outcome in a situation that could had been a long evolution with the need for complex treatments with the use of accessible wound healing therapies.

In this pediatric lactating patient PICO sNPWT was well tolerated and was an effective choice for advanced wound bed preparation.

Products	Time needed for wound healing	Average dressing wear time
Initial treatment: PICO sNPWT	14 days, 2 dressings	7 days
Current treatment: ALLEVYN GENTLE BORDER	28 days, 11 dressings	3 days

Extravasation injury

Start of PICO sNPWT

Application of PICO sNPWT

Follow-up after 2 weeks with PICO sNPWT

Switch to MWH (moist wound healing)

Follow-up after 2 weeks of MWH (moist wound healing)

Healing and end of treatment

*Authors' information not validated by Smith+Nephew.

1. Hudson DA, Adams KG, Van Huyssteen A, Martin R, Huddleston EM. Simplified negative pressure wound therapy: clinical evaluation of an ultraportable, no-canister system. *Int Wound J*. 2015;12(2):195–201. **2.** Payne C, Edwards D. Application of the Single Use Negative Pressure Wound Therapy Device (PICO) on a Heterogeneous Group of Surgical and Traumatic Wounds. *ePlasty*. 2014:152–166. **3.** Stryja J, Staffa R, Říha D, Stryjová K, Nicielniková K. Cost-effectiveness of negative pressure wound therapy in outpatient setting. *Prolekare*. 2015;94(8):322–328.

The use of MolecuLight *i:*X™ Wound Imaging Device, ACTICOAT◊ FLEX 3 Dressing and PICO◊ 7 Single Use Negative Pressure Wound Therapy Device (sNPWT) on an infected diabetic foot

Nadine Price (Care Pathway Lead for Acute Podiatry) - *North East London NHS Foundation Trust (UK)*

Key points

The combination of antibiotics and PICO 7 sNPWT with ACTICOAT FLEX 3 Dressing improved the condition of the wound bed

The patient was happy as he was able to see for himself that the wound bed was improving

Found MolecuLight *i:*X™ to be an invaluable tool when assessing wounds

Introduction

This is a case of a 60 year old male who presented as an emergency to the podiatry clinic following a four week skiing holiday. Prior to his holiday, the patient had a small dry fissure to his right foot that on assessment in clinic had developed into a suspected infection and large diabetic foot ulcer. This case study aims to measure the outcomes following the use of MolecuLight *i:*X™ Wound Imaging Device, PICO 7 sNPWT and ACTICOAT FLEX 3 Antimicrobial Wound Dressing in an infected diabetic foot ulcer.

Case presentation

The patient had a medical history of type 2 diabetes and peripheral neuropathy with an episode of osteomyelitis that was resolved by surgical debridement in 2019.

The patient presented in clinic with what appeared to be an infected wound to the posterior aspect of his right calcaneus. On assessment, the wound bed had grey slough with macerated callus edges and measured 2.0cm x 4.5cm. The wound was visibly deep and was probed to approximately 2cm in depth with no underlying structures showing and moderate levels of exudate. The patient was wearing a heel offloading shoe as recommended by the International working group on diabetic foot guidance (IWGDF) for the prevention and management of diabetic foot.[1]

Wound challenges and management objectives

Prevention

Prior to going on holiday, the patient had been advised that skiing would present a high risk of deterioration in his feet as a prior wound on his left foot had only recently healed. As the patient still wished to go on holiday, the provision of a heel offloading shoe for his right foot was provided and advice was given on the correct use whilst weight bearing. Guidance on minimising weight bearing was also given.

A further challenge presented as the wound itself was in a difficult location on the posterior aspect of the right calcaneus. He had recently been treated for an ulcer on his left foot and so had been predominantly weight-bearing on his right foot. This new wound meant that he was often not achieving non-weight bearing on his right and so further impacting its management.

The patient had previously encountered complications from a diabetic foot ulcer with an episode of osteomyelitis. This previous episode resulted in surgical debridement and based on this previous experience, felt very concerned about a recurrence and further surgical intervention.

The MolecuLight *i:*X™ Wound Imaging Device had demonstrated a red fluorescence (indicative of bacterial burden) at initial assessment and so a tissue sample was taken and microbiology later confirmed an infection was present in the wound and peri-wound area.

Treatment options given initially suggested a hospital admission for intravenous antibiotics, however the patient was reluctant to follow this treatment plan. The patient had an X-ray and MRI which ruled out any underlying osteomyelitis so oral antibiotics were prescribed and an appropriate alternative woundcare approach was determined.

Management

The objectives were to manage exudate levels and optimise wound healing to prevent further deterioration or complications that require intervention or hospital admission. Utilising T.I.M.E.[2,3] principles of wound bed preparation,– Tissue-non-viable or deficient, Infection or inflammation, Moisture imbalance and Edge of wound- non advancing, the key objectives are;

- **T** - Debridement of grey slough to prepare the wound bed.
- **I** - Manage and resolve infection
- **M** - Restore moisture balance to wound
- **E** - Edge of wound non advancing[2,3]

Treatment

In view of the wound bed presenting with grey slough and increased exudate being signs of a local infection,[4,5] the primary objective was to prevent the infection from worsening.[5]

As part of the patient assessment, MolecuLight *i:*X™ Wound Imaging Device was used. MolecuLight *i:*X™ aids assessment of wounds with real time fluorescence imaging to enable indication of bacterial burden at the level of >10^4 Colony-Forming Units/g (CFU's).[6]

On review of the images, the MolecuLight *i:*X™ Wound Imaging Device demonstrated high levels of red fluorescing bacteria in the wound bed and surrounding peri-wound area. Red fluorescence indicates a moderate to heavy growth of bacteria on a semi-quantitive scale.[6] The wound was dressed with an alginate silver and foam dressing.

Following three weeks of oral antibiotics the wound measured 2.0 x 6.2cms with an approximate depth of 2cm with a probe (Figure 1 & 2) which meant a further increase in wound size by 1.7cms in width.

Further challenges with the wound location and signs of infection, triggered the decision to dress the wound with ACTICOAT FLEX 3 Dressing*, an antimicrobial dressing to treat the infection and PICO 7 Single Use Negative Pressure Wound Therapy device (sNPWT) to manage the moderate levels of exudate.

Three days following ACTICOAT FLEX 3 Dressing and PICO 7 sNPWT application, the wound was reviewed using MolecuLight *i:*X™ Wound Imaging Device. The wound showed reduction in red flouresence and maceration (Figure 3 & 4). This regime was applied twice weekly and reviewed by the podiatrist. PICO 7 sNPWT was used intermittently during the plan of care every 2-3 weeks dependent on how the wound was progressing. When PICO sNPWT was not used, ACTICOAT 7 Dressing was used in conjunction with sterile Gauze and bandages.

When reviewed at four weeks the wound had no evidence of red fluorescence, the wound bed appeared healthier and wound edges less macerated. The wound size had reduced to 2.0 x 4.0cms and was unable

Continued on next page

*ACTICOAT FLEX 3 and FLEX 7 are only approved for use with NPWT for up to 3 days.

The use of MolecuLight *i:*X™ Wound Imaging Device, ACTICOAT◊ FLEX 3 Dressing and PICO◊ 7 Single Use Negative Pressure Wound Therapy Device (sNPWT) on an infected diabetic foot

Nadine Price (Care Pathway Lead for Acute Podiatry) - *North East London NHS Foundation Trust (UK)*

to probe its depth (Figure 5 & 6). This gave a wound size reduction of 35% in 4 weeks. Ousey K, *et al.* (2018) suggest that a reduction in wound size greater than 50% in 4 weeks is a prognostic indicator to healing in diabetic foot ulcer.[5] Whilst this case study hasn't met that first indication to suggest healing has restarted, it is important to highlight the presence of infection would have compromised the rate of healing, in addition to the absence of depth measurements that would offer full wound measurement parameters.

Conclusions

The patient in this case study had a history of severe complications with his left foot which had only very recently resolved and was therefore very reluctant to have a further hospital admission or IV antibiotics.

In using the MolecuLight *i:*X™ Wound Imaging Device during the wound assessment it was possible to:

a. Identify that there was an infection,
b. Take an accurate deep tissue sample from an area with high levels of red fluorescing bacteria, and
c. Make a provisional treatment plan with the caveat that if there was no improvement after 3 days

By using the MolecuLight *i:*X™ at subsequent visits, it was assessed that the wound bed had improved and bacterial load had reduced. Treatment with oral antibiotic therapy continued

The patient was happy as he did not have to be admitted to hospital and he was also able to see for himself that the wound bed was improving and the treatment plan was having a positive effect on his wound.

Heathcare professional comment: "*I am very comfortable in using the MolecuLight i:X™ Wound Imaging Device and have found it to be an invaluable tool when assessing wounds for infection and supporting treatment planning.*"

Figure 1 & 2
Day 21 -
Images in standard mode (top) and fluorescence mode (bottom)

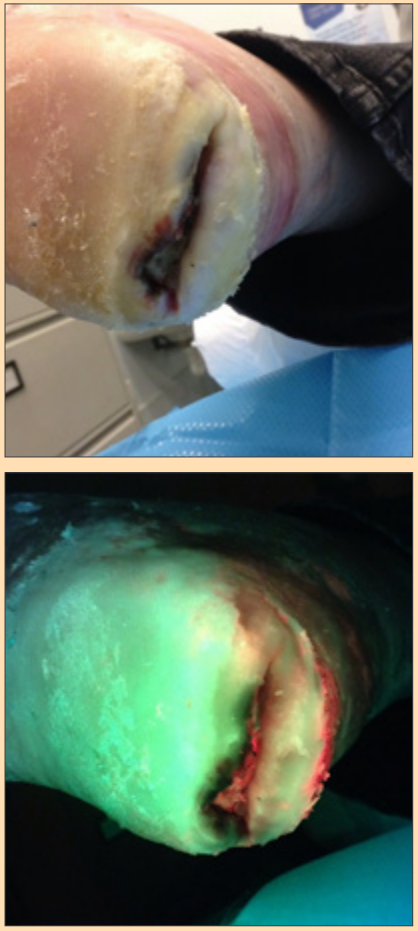


Figure 3 & 4
Day 24 -
Images in standard mode (top) and fluorescence mode (bottom)

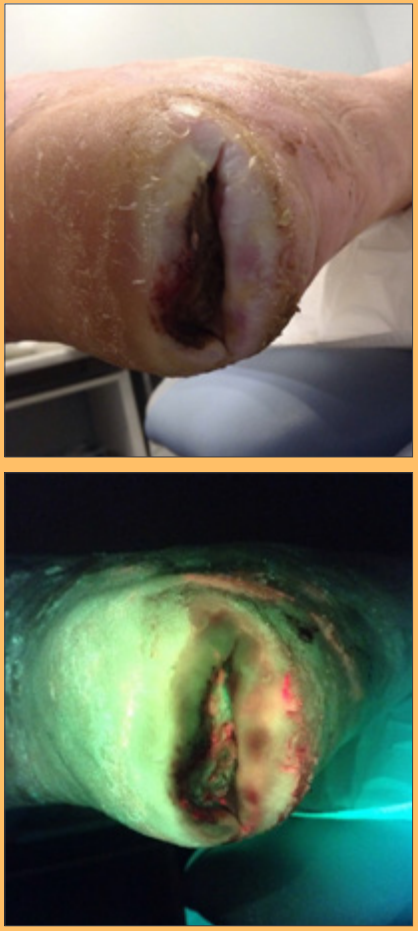


Figure 5 & 6
Day 60 -
Images in standard mode (top) and fluorescence mode (bottom)

Results will vary

1. Rayman G, *et al.* Guidelines on use of interventions to enhance healing of chronic foot ulcers in diabetes (IWGDF 2019 update). *Diab Metab Res Rev.* 2020. e3283.". **2.** Schultz GS, *et al.* Wound bed preparation: a systematic approach to wound management. *Wound Repair Regen.* 11 Suppl 1, S1–28 (2003). **3.** Leaper D, *et al.* Extending the TIME concept: What have we learned in the past 10 years? *Int Wound J* 2012; 9 (Suppl. 2):1–19. **4.** Tickle J. 2015, 'Wound exudate assessment and management: a challenge for clinicans', *British Journal Of Nursing*, 24, pp. S38-S43. **5.** Ousey K, *et al.* 2018. Identifying and treating foot ulcers in patients with diabetes: saving feet, legs and lives. *Journal of Wound Care*, Vol. 27, No. Sup 5. **6.** Rennie M, *et al.* (2016) Clinical Evaluation of Fluorescence imaging in positively predicting the presence of bacteria in . Proceedings of the An Meeting of the Soc of Fed Hlth Prof (AMSUS); Nov 29-Dec 2; *National Harbor*, MD. N=43. **7.** Dowsett C, *et al*, 2017. Use of PICO™ to improve clinical and economic outcomes in hard-to-heal wounds. *Wounds International.* Vol 8 (2). **8.** International Best Practice Guidelines: Wound Management in Diabetic Foot Ulcers. 2013. *Wounds International*, Available from: www. woundsinternational.com

Management of lower limb ulceration using PICO◊ 7 Single Use Negative Pressure Wound Therapy (sNPWT)

Carmel Quirke (Staff Nurse, RGN H Dip) - *Wound Management and Tissue Viability, Dressing Clinic, Mercy University Hospital Cork (Cork - Republic of Ireland)*

Key points

As a result of the application of PICO 7 sNPWT, the patient described an increase in comfort with improved exudate management

The patient also described a significant improvement in quality of life and an end to feelings of social isolation

Introduction

On a trip to Canada while taking anticoagulation medication, the patient sustained trauma to her right lateral calf causing a large haematoma. This resulted in a closed de-gloving injury leading to necrosis. The wound required debridement in Canada six days prior to returning home and then subsequent visits to the dressing clinic on her return.

Case presentation

The patient is a 70 year old female who first attended the dressing clinic on 2018 with an extensive lower limb ulcer secondary to trauma. The patient's medical history includes:

- Osteoarthritis
- Fracture left hip and femur in 2013
- Right hip replacement in 2014
- Left knee replacement in 2015
- Fractured left knee 8 weeks prior to appointment for wound management
- Gastric bypass 2017
- Pulmonary hypertension
- Previous venous ulcers

Patient lives with her husband in a 2 storey house and is independent with activities of daily living. Patient can mobilise with aid of crutches and is a non-smoker. Currently the patient is prescribed the following medications: antibiotic, analgesia and proton pump inhibitor.

A wound assessment was conducted at the patient's first visit on 2018. The following was noted as part of the assessment: extensive traumatic ulceration to right lateral gaiter area; wound bed consisted of 50% granulation tissue and 50% slough; wound depth extended to muscle at proximal aspect of wound and right lower limb exhibited oedema. The patient's lower limb measurement was recorded as 26 cm circumferential at the ankle and 49 cm circumferential at the calf. The wound was photographed, but not measured at this initial clinic visit.

In addition to the wound assessment a vascular assessment was also carried out at this initial dressing clinical visit. Pedal pulses were palpable bilaterally, however Ankle Brachial Pressure Index (ABPI) was not recorded, due to the severity of wound. At the next clinic visit,, the ABPI was recorded from the right ankle and was recorded as; 220/160 = 1.375.

Wound challenges and management objectives

- Significant undermining at proximal and medial aspect of wound
- Impact of the wound on the patient's wellbeing
- High level of exudate from ulcer caused discomfort and embarrassment to patient, which resulted in the patient experiencing social isolation
- Objective was to manage and reduce exudate level, stimulate granulation tissue, reduce frequency of dressing changes and promote healing

Treatment

The patient was reviewed by the vascular consultant. The treatment plan commenced included compression therapy, rest and elevation. The treatment was commenced using an antimicrobial dressing (ACTICOAT◊ FLEX 3 Antimicrobial Barrier Dressing), super absorber dressing (Relevo™, Absorbest AB) and PROFORE◊ Mulit-Layer Compression Bandaging System 18-25 compression therapy. One week later, 25th May 2018, following the aforementioned treatment, the patient was reassessed, with the wound measuring 14 cm x 10 cm (140 cm^2) with significant undermining. Granulation tissue had increased to 70% and slough was reduced to approximately 30%. The clinical decision was made to apply PICO 7 Single Use Negative Pressure Wound Therapy (sNPWT), with a primary dressing of ACTICOAT FLEX 3 Dressing to the wound bed, in conjunction with full compression therapy (PROFORE 18-25). Twice weekly dressing changes continued with ACTICOAT FLEX 3 Dressing and PICO 7 sNPWT.

The wound was reassessed at the end of the two week period, and measured 9 cm x 6.5 cm (58.5 cm^2). The wound was treated with a further two weeks of PICO 7 sNPWT and compression therapy (PROFORE Bandage 18-25); dressing changes occurred twice weekly. The wound measured 8.5 cm x 2 cm (17 cm^2) following this phase of treatment. After the 4 week treatment period there was significant granulation tissue, with no evidence of slough or undermining.

The clinical decision was made to discontinue PICO 7 sNPWT and manage the wound with conventional dressings and compression bandaging. The patient was reassessed on 22nd August 2018, where the wound was found to be fully healed. The patient was therefore discharged from the clinic, with made to measure Compression hosiery, to prevent re-ulceration.

Treatment outcome and results

The application of PICO 7 sNPWT for a 4 week period resulted in the removal of slough, promotion of granulation tissue and progression of the wound to almost complete healing. The healing time of 11 weeks was cost effective by reducing visits to dressing clinic, while still enabling the wound to heal. Graphic 1 demonstrates the healing trajectory of the wound, over the course of the 11 week treatment period.

- During 2 week treatment period where, ACTICOAT FLEX 3 Dressing and PICO 7 sNPWT were applied to the wound, there was an approximate wound area reduction of 58.2%
- On wound assessment, following these two weeks of the aforementioned treatment, the use of ACTICOAT FLEX 3 Dressing was discontinued and the wound continued to received PICO 7 sNPWT. After a further 2 weeks of PICO 7 sNPWT treatment, there was a further approximate wound area reduction of 70.9%
- In the proceeding seven weeks the wound continued to reduce in size, until the patient was discharged from the dressing clinic on 22nd August 2018

Conclusions

As a result of the application of PICO 7 sNPWT, the patient described an increase in comfort with improved exudate management. The patient also described a significant improvement in quality of life and an end to feelings of social isolation. The use of PICO 7 sNPWT was convenient, easy to use and successfully contributed to the achievement of wound healing progression.

Continued on next page

*ACTICOAT FLEX 3 and FLEX 7 are only approved for use with NPWT for up to 3 days.

Management of lower limb ulceration using PICO◊ 7 Single Use Negative Pressure Wound Therapy (sNPWT)

Carmel Quirke (Staff Nurse, RGN H Dip) - *Wound Management and Tissue Viability, Dressing Clinic, Mercy University Hospital Cork (Cork - Republic of Ireland)*

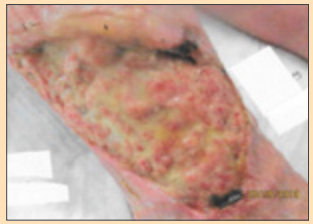
Figure 1
15th May 2018

Figure 2
15th May 2018

Figure 3
18th May 2018

Figure 4
18th May 2018

Figure 5
23rd May 2018



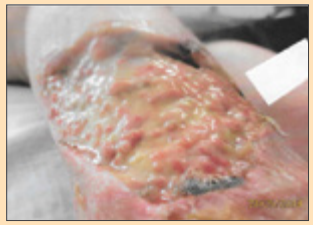


Figure 6
25th May 2018

Figure 7
28th May 2018 -
Wound measured 14 cm x 10 cm (140 cm²)

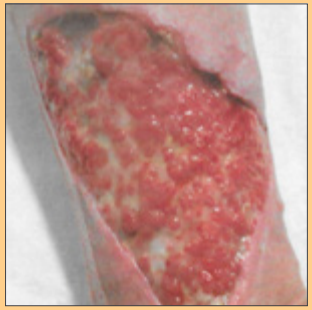


Figure 8
5th June 2018

Figure 9
8th June 2018 -
Wound measured 9 cm x 6.5 cm (58.5 cm²)

Figure 10
12th June 2018

Figure 11
15th June 2018 -
Wound measured 9 cm x 4 cm (36cm²)

Figure 12
22nd June 2018

Continued on next page

Management of lower limb ulceration using PICO◊ 7 Single Use Negative Pressure Wound Therapy (sNPWT)

Carmel Quirke (Staff Nurse, RGN H Dip) - *Wound Management and Tissue Viability, Dressing Clinic, Mercy University Hospital Cork (Cork - Republic of Ireland)*

Figure 13
27th June 2018 -
Wound measured 8.5 x 2 cm (17 cm²). PICO 7 sNPWT was discontinued and patient continued to receive PROFORE◊ 18-25 compression therapy

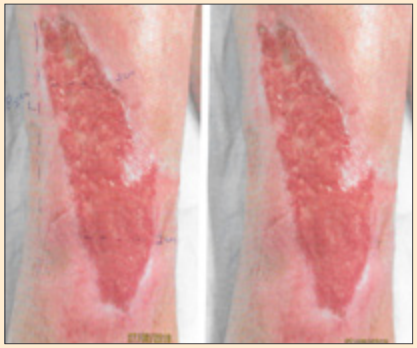


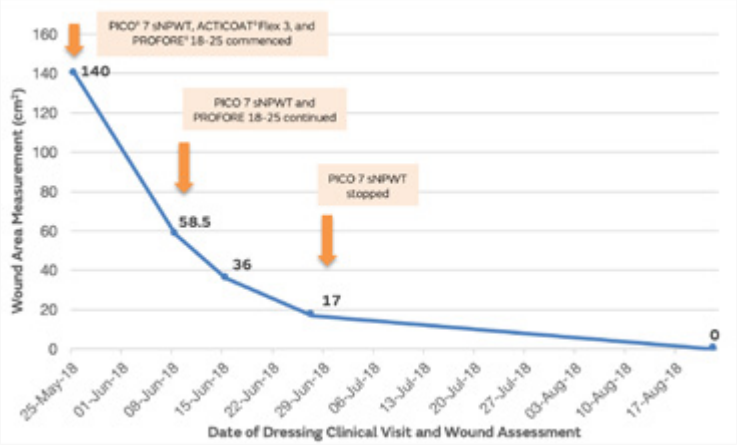
Figure 14
2nd July 2018

Figure 15
9th July 2018

Figure 16
16th July 2018

Figure 17
30th July 2018

Graphic 1
Wound healing trajectory over 11 week period



Use of PICO◊ sNPWT in a patient with a mangled limb

Mr Francesc Zamora Carmona (Trauma and Orthopaedic Nurse, Outpatient Department), Ms Helena Costa Ventura (Head of Outpatient Department), Dr Mònica Salomó Domènech (Trauma and Orthopaedic Assistant Physician) - *Outpatient Department, Trauma and Orthopaedic Surgery Outpatient, Sabadell Clinic Hospital (Sabadell - Spain)*

Key points

Patient was first treated with RENASYS◊ tNPWT, which helps promote the growth of granulation tissue[1–3] and epithelisation[4–6]

PICO sNPWT was used later on to manage the wound

Successful use of the OneNPWT approach to transition from RENASYS tNPWT to PICO sNPWT

Introduction

Traffic accidents involve a substantial social and emotional impact as well as elevated financial costs.

Patient

A 56-year-old motorcyclist with a history of hypertension and prostate cancer.

Motorbike-lorry crash; mangled right lower leg (grade IIIC open fracture of the tibia and fibula).

Treatment

Due to the complexity of the fracture and complications, he underwent five surgeries over a period of 1 year and 4 months.

External fixator (EF) placement, anterior tibial artery to dorsalis pedis artery bypass, pretibial escharotomy, necrotic bone removal, cement spacer placement, left anterolateral thigh flap, new flap with free skin graft.

Dressing changes were performed both during hospitalisation and in trauma and orthopaedic outpatient clinics.

Follow-up/results

Patient with EF and substantial skin deficit. It was decided to treat the wound (Cuticerin gauze dressing and foam) with the RENASYS tNPWT System, and later the PICO sNPWT System; due to the difficulty in maintaining an airtight dressing seal, a malleable resin bar was used in the area of the EF pins.

Growth of granulation tissue and substantial epithelisation.

Removal of the cement spacer, osteotomy of the proximal tibia to lengthen and minimise shortening (transport). The patient had skin deficits and ulcers which were dressed with moist wound dressings. The patient received education about transport and psychological support throughout the process.

Conclusions

Complete epithelisation of the skin.

Sequelae due to ankle fixation in the equinus position with reduced mobility. The patient had to wear a platform orthopaedic shoe and walk with a cane. He was unable to work and continued to require counselling.

RENASYS tNPWT

PICO sNPWT

Note: Application under HCP instructions. Please refer to IFU

1. Young S, Hampton S, Martin R. Non-invasive assessment of negative pressure wound therapy using high frequency diagnostic ultrasound: oedema reduction and new tissue accumulation. *Int Wound J.* 2013;10(4):383–388. **2.** Dunn R, Hurd T, Chadwick P, *et al.* Factors associated with positive outcomes in 131 patients treated with gauze-based negative pressure wound therapy. *Int J Surg.* 2011;9(3):258–262. **3.** Chan S, Wong K, Lim J, Tay Y, Nather A. The role of RENASYS-GO in the treatment of diabetic lower limb ulcers: A case series. *Diabetic Foot and Ankle.* **4.** Apelqvist J, Willy C, Fagerdahl A, *et al.* EWMA Document: Negative Pressure Wound Therapy Overview, Challenges Perspectives. *Journal of Wound Care.* 2017;26(3):S1–S154. **5.** Hurd T, Rossington A, Trueman P, Smith J. A Retrospective Comparison of the Performance of Two Negative Pressure Wound Therapy Systems in the Management of Wounds of Mixed Etiology. *Adv Wound Care* (New Rochelle). 2017;6(1):33–37. **6.** Monsen C, Wann-Hansson C, Wictorsson C, Acosta S. Vacuum-assisted wound closure versus alginate for the treatment of deep perivascular wound infections in the groin after vascular surgery. *J Vasc Surg.* 2014;59(1):145–151.

Using PICO◊ 7 Single Use Negative Pressure Wound Therapy (sNPWT) for the treatment of a non-progressing open wound following resection of a Pilonidal Sinus

Helen Moloney (Tissue Viability Nurse) - *Midlands Regional Hospital, Tullamore , Co.Offaly (Offaly - Republic of Ireland)*

Key points

The application of PICO 7 sNPWT led to a reduction in time to heal

A reduction in the number of dressing changes compared to standard dressings

PICO 7 sNPWT was easy to apply and comfortable for the patient

The author would like to thank Jacqui Hughes, Clinical Excellence Manager at Smith+Nephew for supporting the medical writing of this case study.

Overview

A pilonidal sinus is an infected tract under the skin between the buttocks. Despite being a common condition there is no consensus as to how to manage pilonidal disease post operatively. The condition is relatively common, and represents a significant burden to primary and secondary care with the majority of cases requiring urgent operative intervention.[1] At present, both emergency and the most common elective excisional surgical treatments can leave large open wounds that may take months to heal.[1] Patients consequently require prolonged wound care from their community services. As the disease tends to affect young otherwise healthy adults, this prolonged need for dressings and general wound care impacts on education, work, intimacy and social life, pain, recurrent infection and fear of wound deterioration, all severely affecting quality of life.[2]

Case presentation

The patient, was admitted to hospital for a resection of a pilonidal sinus. Post-operatively for the next 4 weeks, the wound was treated three times a week with conventional dressings suitable for packing. On reassessing, the wound was deemed as not progressing and a decision was made to change the current regime to the application of PICO 7 sNPWT. The wound measured 7cms x 2cms (14cms^2 ; Figure 1). A wound swab was taken and microbiology reporting found anaerobic growth with the presence of *Staphylococcus aureus*.

The wound impacted the patient in terms of his social life and as such was unable to participate in sport.

Treatment and outcomes

Due to the ineffectiveness of the previous dressing regime, the main objectives that informed a decision to use PICO 7 Single Use Negative Pressure Wound Therapy were:

- Promote healing
- Manage exudate
- Promote granulation tissue

At week 3, the wound was progressing with 100% granulation tissue at the base of the wound (Figure 2). In all, PICO 7 sNPWT was applied, being changed on a weekly basis until the wound was fully healed (Figure 3).

Conclusions

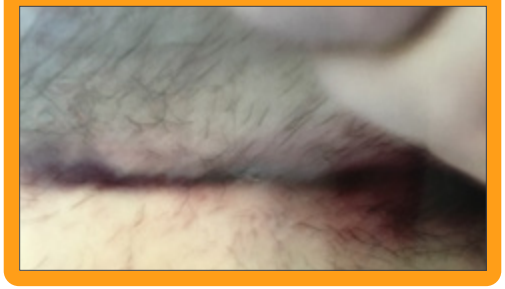
Open Pilonidal Sinus wounds can be difficult to treat and can often develop into a chronic wound.
The application of PICO 7 sNPWT led to an increased rate of healing, compared to previous conventional dressings used for 4 weeks post-operatively. The wound healed within a 5-week period, and the patient was able to return to his normal social activities. The patient felt a sense of security as the dressings remained intact and achieved healing without the daily dressings that had been carried out prior to the treatment with PICO 7 sNPWT.

The clinician reported that the PICO 7sNPWT was easy to use and proved to be a comfortable dressing choice for the patient.

Figure 1
Day 0 -
Pilonidal sinus prior to application of PICO 7 sNPWT. Wound size: 7cms x 2cms (14cms^2) x 2cms deep

Figure 2
Progressing to healing, wound dry with 100% granulation tissue

Figure 3
Day 35 -
Fully healed



Results may vary

1. Harris C, Sibbald RG, Mufti A, Somayaji R. Pilonidal sinus disease: 10 steps to optimize care. *Advances in Skin and woundcare*, Vol 29. 2016. **2.** Young T. Understanding pilonidal sinus disease. *Wounds UK*, Vol.15, 2019.

The use of Negative Pressure Wound Therapy (NPWT) in the management of a paediatric patient with a complex sternotomy wound

Cheri Pearce (Tissue viability nurse) - *University Hospitals Birmingham NHS Foundation Trust (UK)*

Key points

PICO◊ 7 Single Use Negative Pressure Wound Therapy (sNPWT) helped to reduce length of patient stay and facilitate hospital discharge vs. tNPWT

The patient described improvement in quality of life with PICO 7 sNPWT vs. tNPWT

The application of PICO 7 sNPWT led to a reported reduction in time to heal

The author would like to thank Kate Hurring, Complex Wound Specialist at Smith+Nephew for supporting the medical writing of this case study.

Introduction

Loeys-Dietz syndrome is a genetic disorder of the body's connective tissue.[1] Disorders of the connective tissue can affect the whole body including the heart, skeletal system, skin, eyes and immune system.[1] One of the features of Loeys-Dietz syndrome is an enlargement of the aorta, the aorta can weaken and stretch, leading to an aneurysm. Patients have a high risk of aortic dissection or rupture at an early age. Heart defects may be present at birth and cardiac surgery may be indicated.[1]

Case presentation

A 15-year-old patient underwent his third major open chest surgery at the Queen Elizabeth Hospital in Birmingham. He had previously undergone aortic dissection repair and valve sparing root replacement to manage his complex cardiac needs. Six days post-operatively following this third open chest procedure it was evident that he had surgical site wound complications. The wound had extending erythema, the patient complained of an increase in pain and the wound was exuding high volumes of serous exudate. He was taken back to theatre for wound exploration and soft tissue debridement. The tissue sample tested positive for *Mycobacterium*. Environmental mycobacteria are found in water and dust, and it has been known to contaminate medications and products including medical devices. Healthcare associated infections due to this bacterium are usually of the skin and soft tissues.[2]

Treatment

Postoperatively, the wound was managed with traditional negative pressure wound therapy (tNPWT) with the pump set at a pressure of -100mmHg. Continuous tNPWT was delivered for a total of one week, and the patient was commenced on intravenous antibiotic therapy. On Day 7 (Figure 1) the wound measured 9cm (L) x 3.5cm (W) x 1.5cm (D) with 100% granulation tissue. Although the wound was improving, the patient found the tNPWT device cumbersome and restrictive.

The decision to switch treatment was carefully evaluated by the lead practitioner in conjunction with the assessing clinician, who believed that sNPWT was the best option versus tNPWT or conventional dressings. PICO 7 sNPWT would deliver negative pressure to a wider zone of injury and increase the perfusion to the poorly perfused tissue, and to the bruised surrounding area.[3] PICO 7 sNPWT would also provide support by reducing lateral tension.[4]

On Day 7 PICO 7 sNPWT was commenced to facilitate further healing and hospital discharge. PICO 7 sNPWT was commenced using a negative pressure wound therapy gauze filler, with a twice-weekly dressing change in line with the instructions for use. The patient was reviewed in clinic after one week.

After a week of sNPWT, the wound measured 9cm (L) x 2.2cm (W) x 1cm (D) with 100% granulation tissue (Figure 2). The wound had achieved a 1.3cm reduction in wound width and 0.5cm reduction in wound depth in one week. The reduction in wound depth meant that the wound could now be managed with PICO 7 sNPWT without using a wound filler, therefore dressing changes were reduced to just once per week.

At day 21 (Figure 3), the wound was described to be almost closed with 90% epithelial tissue to surface and 10% of the wound remained superficially open.

The patient's morale was high, he was managing activities of daily living and was discharged home with ALLEVYN◊ GENTLE BORDER Foam Dressing.

Conclusion

Complex wounds in paediatrics and dressing changes remain a considerable source of anxiety for patients and parents and is an ongoing concern to healthcare professionals. PICO 7 sNPWT showed greater advantage over tNPWT for the management of this complex wound. Due to its portability and ease of use it enabled the patient to be quickly discharged from hospital and return home and resume daily activity. The importance of decreasing time to wound closure for complex wounds is a critical aspect when managing paediatric patients. Returning the patient quickly back to his everyday activities enhanced the well-being of both the patient and his family members.

With technological advancement, emerging evidence of using a simple and portable single use Negative pressure wound therapy (sNPWT) like PICO 7 sNPWT has been demonstrated to achieve statistical superior outcomes in terms of wound progression towards healing versus tNPWT.[5]

Figure 1
Day 7 - *9cm(L) x 3.5cm (W)*
100% granulation tissue

Figure 2
Day 14 - *9cm (L) x 2.2cm (W) x 1cm (D)*
100% granulation tissue

Figure 3
Day 21 - *90% epithelial and 10% superficial opening*

Outcomes may vary

1. Loeys-Dietz Syndrome -The Marfan Foundation 2014. https://www.marfan.org/about/related-disorders Accessed 25.05.2021. **2.** Myobacterium in Healthcare settings – Centre for Disease Control & Prevention. 2021. https://www.cdc.gov/hai/organisms/nontuberculous-mycobacteria.html Accessed 25.05.2021. **3.** Watkins H, Huddleston E. Unlocking the mode of action: why might a no-canister, ultra-portable, single use negative pressure wound therapy (sNPWT) device be clinically superior to traditional negative pressure wound therapy (tNPWT). **4.** Loveluck J, Copeland T, Hill J, Hunt A, Martin R. (2016) Biomechanical modelling of the forces applied to closed incisions during single-use negative pressure wound therapy. *ePlasty*. 16, pp.183–195. **5.** Kirsner R, Dove C, Reyzelman A, Vayser D, Jaimes H. (2019) A prospective, randomized, controlled clinical trial on the efficacy of a single use negative pressure wound therapy system, compared to traditional negative pressure wound therapy in the treatment of chronic ulcers of the lower extremities. *Wound Repair and Regeneration*, 27(5), pp.519–529.

Use of PICO◊ sNPWT case in pilonidal cyst

Dr Jordi Bombardó (Colorectal Surgeon), Ms Marta Fernández (Nurse), Ms Eva Ángeles Sánchez (Nurse) - *Parc Taulí University Hospital (Sabadell - Spain)*

Wound deeper than 2cm

Key points

Multisite dressing was used in an anatomically awkward area

3 months

Healing time was shortened by approximately 3 months compared to the standard dressing

Because of the positive healing trajectory, this young patient is able to return to his daily activities

Patient

A 30 year-old man with no remarkable medical history and a pilonidal cyst that began to develop three years earlier.

Treatment

Surgery.

A cyst measuring 5cm in size, with no active fistula and distal granuloma draining serous fluid.

Equipment

- PICO sNPWT
- No-Sting Skin-Prep spray
- Adhesive Gel patch
- Foam filler

The dressing was applied in the operating theatre, but due to the risk of bleeding, it was decided to check it at 24 hours.

Follow-up

2 weeks.

2 dressings per week.

Recommendation

Apply the lower adhesive strips with the patient standing up in order to improve comfort during movement.

Conclusions

The wound took approx. one and a half months to close.

Healing time was reduced by an estimated 50% (3 months) compared to the treatment duration with the standard dressing regimen.

PICO sNPWT has been shown to deliver greater healing rates vs SoC.[1]*

The PICO dressing was used for approximately 2 weeks during the most exudative phase. The wound showed substantial reduction in size; the patient was then switched to moist wound healing with absorbent dressings.

Exudate control with the PICO dressing prevents leakage, improving the quality of life of patients with pilonidal cysts, who tend to be young with an active lifestyle.

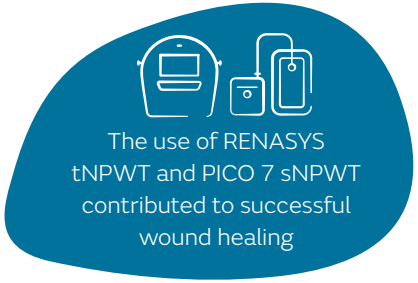
*p=0.001; 52 wounds.

1. Dowsett C, Hampton J, Myers D, Styche T. Use of PICO to improve clinical and economic outcomes in hard-to-heal wounds. *Wounds International.* 2017;8, p53–58.

The use of RENASYS◊ Negative Pressure Wound Therapy (NPWT) and PICO◊ 7 Single use Negative Pressure Wound Therapy (sNPWT) on a patient with a non-healing pilonidal sinus

Nicola Crouch (Wound Care Specialty Nurse) - *Berkshire Healthcare NHS Trust (UK)*

Key points



Introduction

This is a case study of a 29 year-old male with no previous medical history whom usually has an active and independent lifestyle. The patient presented with a wound to his inter-gluteal region due to laid open high anal fistula with exclusion of pilonidal sinus. Pilonidal sinus occurs in the cleavage between the buttocks and can cause pain, discomfort and embarrassment.

Typically these wounds can be a serious challenge to healthcare professionals, significantly impacting patients economically and socially.[1]

Since the initial surgical treatment for the pilonidal sinus, the patient had been treated both with conservative dressings and further surgical interventions that left the patient with an unhealed wound of three year duration. Having been treated for many years, this hard to heal wound was impacting the patient, finanically, emotionally and mentally with concerns for his health and wellbeing. Following a third failed surgical intervention, the patient was reviewed by the wound care nurse and treatment with RENASYS tNPWT and PICO 7 sNPWT was commenced.

Case presentation

The initial wound management involved daily dressings with the expectation of it healing by secondary intention, however, surgical interventions were required in 2017 and 2019. The wound was treated with Hydrofiber™ packing ribbon on alternate days by the practice nurse. This continued for 18 months until further surgery was undertaken to reconstruct and close the wound.

Further complications arose 3-4 weeks post operatively when the wound broke down again.

Treatment consisted of conservative dressings that were continued by the patient's wife. This shared care continued for a further 6 months until further surgical intervention was undertaken. Day three post operatively, the wound dehisced following the development of a haematoma.

Treatment

The wound measured 6cm x 3cm x 4cm and RENASYS GO Negative Pressure Wound Therapy System (tNPWT) was started.

After two weeks of treatment with RENASYS GO tNPWT the patient was assessed by the wound care nurse. PICO 7 sNPWT was initiated as exudate management requirements had reduced and a smaller device enabled greater mobility for the patient.

A dressing regime using the PICO 7 system, a portable sNPWT device was applied over a 6 week period in a community setting. Dressings were initially changed twice per week. Progress was monitored by wound measurements and photographs. An antimicrobial gauze was used to pack the cavity.

Outcomes

The treatment plan resulted in a reduced dressing change frequency from daily to twice weekly and enabled him to return to work and re-establish a financial income.

Following the treatment with RENASYS GO tNPWT the wound reduced from 6cm x 3cm x 4cm to 5cm x 1cm x 4cm (Figure 1).

Whilst being treated with PICO 7 sNPWT, the wound size was measured at 11 days, 4cm x 1cm x 2cm (Figure 2), 14 days 2cm x 1cm x 1cm (Figure 3) and 32 days 1cm x 1cm x 0.5cm (Figure 4). The combination of RENASYS tNPWT and PICO 7 sNPWT systems as a treatment plan resulted in a wound reduction of 94% and at the end of the treatment, complete wound closure was achieved.

As a result of using PICO 7 sNPWT, the patient experienced a decrease in pain levels, increased comfort and an improvement in his mental health. The wound and surrounding skin showed a decrease in oedema, a reduction in odour and new granulation tissue had formed in the wound bed, resulting in complete wound closure.

Health, economics and resource outcome

The impact of this plan of care was also positive for the healthcare providers as the nursing resources required for daily dressings were reduced to twice weekly with PICO 7 sNPWT. Additionally the complete clousure of the wound prevented the potential need for additional costly surgical procedures being undertaken that could further impact healthcare resources and costs.

Conclusion

Using RENASYS GO tNPWT and then transitioning to the PICO 7 sNPWT system had a positive impact on the patient's experience and confidence which had previously been destabilised from earlier treatment.

The introduction of a small, portable and lightweight system enabled greater access to this therapy for the patient in the community.

This approach enabled the patient to resume their usual activities and led to complete wound closure.

Continued on next page

1 2

1. Mahmood F, Hussain A, Akingboye A. Pilonidal sinus disease: Review of current practice and prospect for endoscopic treatment. *Annals of Medicine Surgery*. 2020;57:212–217.

The use of RENASYS◊ Negative Pressure Wound Therapy (NPWT) and PICO◊ 7 Single use Negative Pressure Wound Therapy (sNPWT) on a patient with a non-healing pilonidal sinus

Nicola Crouch (Wound Care Specialty Nurse) - *Berkshire Healthcare NHS Trust (UK)*

Figure 1
Day 0 -
Application. *Measuring 5cm x 1cm x 4cm*

Figure 2
Day 11 -
PICO 7 sNPWT application. Measuring 4cm x 1cm x 2cm

Figure 3
Day 14 -
PICO 7 sNPWT application. Measuring 2cm x 1cm x 1cm

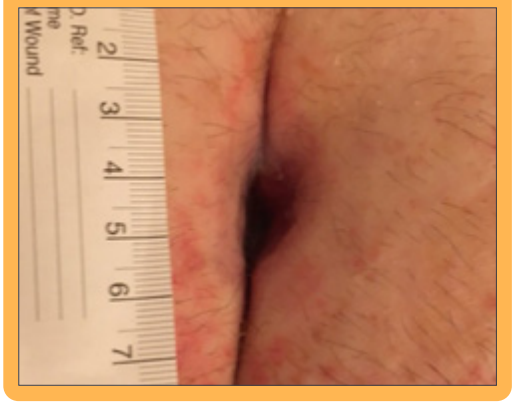


Figure 4
Day 32 -
PICO 7 sNPWT application. Measuring 1cm x 1cm x 0.5cm

Outcomes may vary

The use of PICO◊ 14 Single Use Negative Pressure Wound Therapy device (sNPWT) on a post excision basal cell carcinoma wound*

Gillian O'Brien (Advanced Nurse Practitioner) - *Tissue Viability, Naas General Hospital, County Kildare (UK)*

Key points

The clinician noted a potential for PICO 14 sNPWT to help kick-start stalled wound healing

PICO 14 sNPWT was chosen in this case to aid in the management of a larger wound while requiring less user intervention

Introduction

This case study outlines the treatment for a patient post excision of basal cell carcinoma (BCC) to the right scapula, who was treated with PICO 14 sNPWT.

Case presentation

The patient was a 54 year-old who presented to the advanced nurse practitioner (ANP) 11 weeks post excision of a basal cell carcinoma (BCC) to the right scapula. The patient was usually fit and well and had no significant past medical history.

Prior to seeing the ANP the patient was being managed by the public health nurse (PHN) as the wound had dehisced following surgery due to a wound infection, the wound had already been treated with antimicrobial dressings and the patient had received oral antibiotics, the wound was being treated by the public health nurses (PHN) in clinic on a daily basis.

Wound challenges and management objetives

Due to the patient being seen on a daily basis by the PHN the patient was finding dressing costs expensive due to the volume needed.

The PHN found the wound complex to treat due to the wound infection which had caused the wound to dehisce, she was also having difficulty dressing the wound due to the location on the scapula so needed a treatment that would stay in place but would also be comfortable and cost-effective for the patient as he was paying for dressings.

Treatment

The patient was being treated by the PHN for 11 weeks prior to being assessed by the ANP, during this time he received antibiotics for two weeks to treat the wound infection systemically and the wound was being dressed with an antimicrobial foam dressing daily.

Following assessment by the ANP the wound was deemed to be suitable for NPWT, it was decided that PICO 14 sNPWT would be used, this is an enhanced pump to aid use in larger wounds with less user intervention,[1] due to the pump duration of up to 14 days.[2]

Treatment outcome and results

On initial assessment by the ANP (Figure 1) the wound measured 9.5cm (L) x 5.5cm (W) x 1cm depth (wound surface area = 41.0cm^2) the wound had 100% healthy granulation tissue, PICO 14 sNPWT was applied directly to the wound with no filler (Figure 2), the dressing was changed at 7 days and then at 14 days where the pump was removed.

At 14 days the wound now measured 6.7cm (L) x 4.2cm (W) x 0.3cm depth (wound surface area = 23.1cm^2) the wound remained granulating and there were clear signs of epithelialisation (Figure 3), there was an overall wound healing reduction of 45% after 14 days of PICO 14 sNPWT.

It was decided by the ANP to use another PICO 14 sNPWT for a further 2 weeks to encourage wound healing, at the end of the 2 weeks the wound measured 4cm (L) x 1.8cm (W) with no depth (wound surface area = 5.7cm^2) the overall wound healing reduction was 75% (Figure 4), sNPWT was discontinued and a conventional dressing was applied to the wound – after 2 weeks the wound had completely healed.

Conclusions

The management of this wound was time consuming and costly to the healthcare system and also the patient.The clinician noted a potential for PICO 14 sNPWT to kick-start stalled wound healing.

Figure 1
Wound on initial assessment with ANP

Figure 2
Application of PICO 14 sNPWT

Figure 3
Wound after 14 days of PICO 14 sNPWT

Figure 4
Wound after 28 days of PICO 14 sNPWT

Individual results will vary

*PICO 14 sNPWT is contraindicated for patients with malignancy in the wound bed or margins of the wound (except in palliative care to enhance quality of life). For detailed product information, including indications for use, contraindications, precautions and warnings, please consult the product's applicable Instructions for Use (IFU) prior to use.

1. Smith+Nephew 2019. Research & Development Report. PICO 14 and PICO 7 Initial Pump Down and Maintenance Pump Down Time Outs RD/19/084. **2.** Smith+Nephew December 2018. PICO 14 Service Life Testing: 14 Day Device Lifespan. Internal report. RD/18/132.

PICO◊ 14 sNPWT in a renal post-transplant dehisced surgical wound

Thomas Leong CNC (Skin Integrity & Wound Management) - *Royal Prince Alfred Hospital, Sydney (Australia)*

Key points

PICO 14 sNPWT was effective at reducing the wound depth and managing the exudate

Patient was happy with the size and weight of PICO sNPWT, which helped with her therapy compliance

Wound closure achieved at reasonable time, which lead to reduction to the overall cost

Introduction

Renal Transplant patients have numerous co-morbidities and therefore have foreseeable complications post-transplant surgery. Dehiscence is a regular occurrence which often requires Negative Pressure Wound Therapy (NPWT) for a lengthy period of time.

Case presentation

- 61 year old female with history of diabetes mellitus, hypertension, end stage renal disease received a transplant in March 2020
- Four weeks post-transplant returned to hospital with fevers, candiduria, anaemia requiring iron and 1unit RBC infusion, AKI, hyperK+, glycaemic . Subcutaneous collection at the RTx surgical wound (65ml on admission vs 44ml 25/03). Ongoing anaemia.
- Wound was drained and traditional negative pressure wound therapy (tNPWT) was applied after a course of antimicrobials during her admission, the patient was discharged in April 2020.
- Followed up in the renal transplant clinic on the following Mondays and Thursdays.
- Initial review was conducted in May 2020 (Figure 1)

Wound challenges and management objectives

- The main challenge for this wound was, as with all renal transplant patients, immunosuppression leading to delayed wound healing
- The challenge for this patient in terms of the wound itself was not the size of the opening but rather the depth of the tunneling. Fortunately the level of exudate was not excessive, with only a small collection of fluid draining with each dressing change. The need to close this wound without leaving a sinus was still the goal.
- The use of the larger tNPWT device was beginning to cause some shoulder pain
- Dressing changes were carried out 2 x per week necessitating returns to hospital despite no longer requiring medical follow-up post-transplant
- As the tNPWT had already been utilised for over 6 weeks with little change in the depth of the tunneling, the goal was to retract the wound from the bottom to the surface before it closed over. Time frames were difficult to ascertain due to the immunosuppression however it was hoped to achieve this within 3-4 weeks

Treatment

- Traditional NPWT with foam filler was utilised for 46 days prior to application of the PICO 14 sNPWT. Initially there was a large amount of exudate of up to 300mls/per dressing change
- During this course of treatment the exudate level did decrease to approx. 100mls per change and the opening of the wound also reduced however, the length of the tunnelling had not receded
- The PICO 14 sNPWT was applied for over 14 days and the pump allowed to expire whilst the patient was at home (Figure 2). The wound was then reviewed at the next scheduled dressing change
- Opening measured at 1cm^2 however remained 8cm deep (Figure 3)
- Twice weekly dressing changes were conducted so that the foam wound dressing would not become adherent inside the tunnel and the level of exudate would not overwhelm the dressing, and thus avoiding maceration of the peri-wound skin (Figure 4)
- At Day 10 after the commencement of PICO 14 sNPWT, it was 60% smaller (0.33cm^2) and 3.5cm deep (Figure 5).
- 15 days later the wound was 0.27cm^2 and only 1cm deep (Figure 6)
- On day 18, the dressing was changed to a more conservative dressing of hydrofibre and silicone foam, changed weekly
- Most likely the wound was very close to healed by the end of week 3 however, the wound was only able to be reviewed on week 4, where the wound was completely closed with nil further treatment required (Figure 7)

Treatment outcome and results

- The end result was positive with complete wound closure achieved within the aimed 4 week period (Figure7)
- We were able to achieve this wound closure with a measurable reduction in the wound depth and thereby eliminating the risk of sinus formation under closed epithelium
- The dressing itself remained safe to use even when the negative pressure aspect was eliminated due to expiry of the pump
- Our patient was much happier with the size and weight of the pump which made it easier for her to be very compliant with her treatment
- As this was an initial evaluation of the PICO 14 sNPWT, our dressing changes may have been more frequent than necessary in the last week. This may have impacted on the economic savings however, the savings with the elimination of the rental associated with the tNPWT product was significant

Discussion and conclusions

- There are hundreds of renal transplants conducted every year at RPAH and due to the co-morbidities of these patients, many of them experience wound healing issues after their initial surgery. NPWT is a frequent choice of treatment and is often a lengthy process
- For this case, the PICO 14 Single Use Negative Pressure Wound Therapy was very effective at reducing the wound depth, managing the exudate, maintaining patient comfort and reducing the overall cost. All of this was achieved along with the ultimate goal of closing the wound in a very reasonable time frame.
- *"Overall, the PICO 14 System is a very useful addition to one's disposable NPWT quiver. The 14 days provided is enough time to ensure that a wound is progressing in the right direction and the ability to cater for a wound depth of up to 7cm is what sets it apart from the others."*

Continued on next page

1 2

PICO◊ 14 sNPWT in a renal post-transplant dehisced surgical wound

Thomas Leong CNC (Skin Integrity & Wound Management) - *Royal Prince Alfred Hospital, Sydney (Australia)*

Figure 1
Week 1 – May 2020

Figure 2
Week 2 – June 2020

Figure 5
Week 3 – June 2020

Figure 7
Week 6 July 2020

Figure 3
Week 2 – June 2020

Figure 6
Week 4 – June 2020

Figure 4
Week 2 – June 2020

The use of PICO◊14 Single Use Negative Pressure Wound Therapy device (sNPWT) on a Pre-tibial traumatic wound

Pat McCluskey (Advanced Nurse Practitioner) - *University Hospital Cork, Wilton (Cork - Republic of Ireland)*

Key points

The application of PICO 14 sNPWT helped kick-started stalled wound healing

Resulting in fewer dressings changes when compared to the previous treatment method

Case presentation

The patient was a 63 year old male who sustained a pre-tibial traumatic wound to the right leg. He had a past medical history of macular degeneration, type 1 diabetes (on insulin), diabetic retinopathy and chronic hepatitis with portal hypertension.

The patient attended the soft tissue clinic for initial assessment and was admitted to hospital for debridement of the wound and split thickness skin graft (SSG). A split thickness skin graft is a thin layer of skin, comprising of a portion of the dermis and the attached epidermis that is shayed from an area that usually heals weel.[1] Once the skin graft is place, a dressing is applied and the patient receives regular wound management to ensure the graft takes and heals.

Following surgical debridement and SSG the wound skin graft did initially take, but due to infection, the graft was lost and the decision was made to heal the wound without another SSG. The patient also received a variety of treatments to try to encourage wound healing; Inadine™, IODOFLEX◊ 0.9 Cadexomer Iodine Dressing and Carboflex™ and 3 weeks post skin graft loss, the patient was put into light compression therapy.

After two weeks of compression theraphy the patient was assessed by the Advanced Nurse Practitioner (ANP) who recommended PICO 14 sNPWT to be used.

Wound challenges and management objectives

The patient had co-morbidities which potentially could affect wound healing (diabetes) and also due to wound infection the SSG had been unsuccessful. The ANP was conscious that the patient had received numerous treatments in an attempt to heal the wound prior to her assessment and also that there were concerns regarding the patient's well-being as he was concerned that his wound wasn't healing.

Treatment

Following assessment by the ANP the wound was deemed to be suitable for NPWT (Figure 1), it was decided that PICO 14 sNPWT would be used. PICO 14 sNPWT is an enhanced pump* to aid use in larger wounds with less user intervention,[2] due to the pump duration of up to 14 days.[3]

PICO 14 sNPWT was applied to the wound, light compression bandages were also reapplied as the patient had signs of venous insufficiency and had been prescribed compression therapy two weeks prior to commencement of sNPWT. The wound was reassessed after 7 days and it was noted that there was no change to wound dimensions at this point, PICO 14 sNPWT was reapplied for a further 7 days (Figure 2) – the patient went on to receive sNPWT for a further 14 days so in total received SNPWT for 28 days (Figure 3). The patient then received conventional dressings following PICO 14 sNPWT.

Treatment outcome and results

On initial assessment and prior to PICO 14 sNPWT the wound measured 7.5cm (L) x 4.5cm (W) x 1cm deep (wound surface area = 27.1cm^2), 15% slough (light but adherent). Following 14 days treatment with PICO 14 sNPWT the wound now measured 7cm (L) x 4cm (W) with 0.5cm depth (wound surface area = 22cm^2) and there was an overall wound reduction of 21%.

The patient went on to receive another 2 weeks of PICO 14 sNPWT treatment, at the end of the 2 weeks the wound now measured 6.5cm (L) x 3.5cm (W) with no depth to the wound (wound surface area = 17.4cm^2) there were obvious signs of epithelialisation to the wound edges and the wound had reduced in size by 48%, it was felt at this point to stop using sNPWT and to use conventional dressings.

Conclusions

The management of this wound was complex due to the previous wound infection and loss of SSG and also the patient having diabetes which may have contributed to delayed healing. The use of PICO 14 sNPWT helped to kick-start the stalled wound and to reduce dressing changes compared to those required during earlier treatment protocols.

Figure 1
Wound prior to application of PICO 14 sNPWT

Figure 2
Wound following 14 days therapy of PICO 14 sNPWT

Figure 3
Wound following second treatment (28 days) of PICO 14 sNPWT

*Enhanced from the PICO 7 sNPWT System

1. Shimizu R, Kishi K. Skin Graft. *Plastic Surg Int.* 2012; Article ID: 563493. **2.** Smith+Nephew 2019. Research & Development Report. PICO 14 and PICO 7 Initial Pump Down and Maintenance Pump Down Time Outs RD/19/084. **3.** Smith+Nephew December 2018. PICO 14 Service Life Testing: 14 Day Device Lifespan. Internal report. RD/18/132.

Kick starting wound healing from a stalled sacral wound with PICO◊ 14 sNPWT

Melinda Brooks (Nurse Practitioner Wound Management) - *Wound Wise Consulting & Education (Victoria, Australia)*

Key points

The wound decreased in size during the time the PICO 14 sNPWT was used

PICO 14 sNPWT was easy to apply

The use of PICO 14 sNPWT proved to be a beneficial treatment for the chronic sacral wound

Introduction

Mr A, a 64 year old professional with T12 paraplegia, developed a deep tissue injury to his sacrum whilst holidaying over a 12 day period in October 2019.

Case presentation

Mr A was a 64 yr old male with T3 paraplegia from falling downstairs in 2017. Medical history includes Hypercholeastraemia. NKA. Mr A underwent surgical debridement of the sacral pressure injury, following diagnosis of osteomyelitis (wound measuring 11 x 11cm) with antibiotic treatment for 6 weeks following diagnosis of osteomyelitis. PICO 14 sNPWT commenced in July 2020.

Mr A was well during the healing process but had spent many months in bed due to the sacral wound. The sacral wound measurement was 1 x 0.3cm, 1cm deep. 100% granulation when the PICO 14 sNPWT was introduced. Wound healing had stalled with previous treatment.

Previous therapy included negative pressure wound therapy which was commenced post operatively for 4 months (November 2019 – March 2020) and then an alternative smaller, negative pressure system was used for 2 months (March 2020 – May 2020). Wound was improving and then stagnated in July.

The wound was 1 x 0.3cm, 1cm deep prior to application of the PICO 14. Subsequent assessments:

- July 2020 (Figure 1) – application of PICO 14 sNPWT 1x0.3cm, 1cm deep. Filler used (Sorbact™)
- August 2020 (Figure 2) – 0.5x0.3cm, 0.5cm deep, therapy ceased
- Hydrofiber® dressings then used due to minimal wound depth and size, wound healed

Wound challenges and management objectives

There were some challenges associated with the wound such as ensuring the dressings remained dry and intact (due to the location), ensuring a good seal and ensuring no further pressure on the patient's skin from use of products and devices.

When using various negative pressure systems, one challenge was ensuring that the nurses attending to the wound care were able to competently apply the system to ensure maximum benefit. Therefore there was some staff training involved.

The impact of such a significant pressure injury on the patient was substantial. The patient works full-time and not being able to go to his office or sit in his wheelchair to use his laptop, impacted on his work life and also psychological state.

From the clinical perspective, the goals of using the PICO 14 sNPWT were to:

- Accelerate wound healing
- Reduce frequency of dressing changes
- Minimise any inconvenience for the patient
- Ensure the dressing remained intact and a good seal was maintained

Treatment

The sacral wound improved with the use of the PICO 14 sNPWT to the point where depth and wound size was quite small and a clinical decision was made to cease the therapy. The PICO 14 sNPWT was used for a total of four weeks. The wound was reviewed 3x/week by a community nurse and I consulted with the client on a monthly basis

Treatment outcome and results

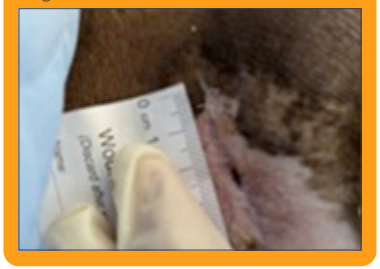
Mr A's wound decreased in size during the time the PICO 14 sNPWT was used and he stated that he was pleased with the outcome as healing was being achieved. Mr A was at home during the time of the treatment and nursing visits remained three times per week, no change from previous frequency.

Discussion and conclusion

- The use of PICO 14 sNPWT proved to be a beneficial treatment for the chronic sacral wound. Mr A did not experience any pain (due to paraplegia) and frequency of care had minimal impact on the patient's daily life.
- PICO 14 sNPWT was easy to apply and there were no issues with leakage or the dressing coming away. There were no issues with loss of suction. There were no complications of skin damage from the tubing during the treatment.
- Changing the wound regime to use PICO 14 sNPWT was beneficial to Mr A's wound healing where the wound had become stagnant and was failing to progress.

Figure 1
July 2020

Figure 2
August 2020



PICO◊ 14 sNPWT evaluation – skin tear

Thomas Leong CNC (Skin Integrity & Wound Management) - *Royal Prince Alfred Hospital, Sydney (Sydney - Australia)*

Key points

PICO 14 sNPWT was very effective at helping reduce the wound size and managing the exudate whilst maintaining patient comfort

PICO 14 sNPWT provides 14 days of treatment to ensure enough time for a wound to progress in the right direction

The end result was positive with an overall 81% reduction in wound size in slightly over the aimed 4 week period

Introduction

Elderly patients, even without numerous co-morbidities, not only have an increased risk of injury, but also have a decreased ability to heal due to the changes to skin as a result of ageing (Thinner, drier, loss of elasticity, with less subcutaneous tissue). Wound healing rates can be up to 4 times slower. Our goals are therefore to use the best means possible to achieve faster wound closure to avoid co-morbidities in this vulnerable group.

Case presentation

- 87 year old female with history of bronchiectasis, diverticulitis, helicobacter pylori
- Self presents with worsening infection to L shin Skin tear (category 3) 1 week prior
- Looked after by GP however the wound was worsening with more pain and increased necrotic tissue present (black edges and black slough). Leg very oedematous and inflamed compared to the uninjured leg.
- Four days of oral Antibiotics prescribed by GP with nil effect
- Treated with 3 days IV Cephazolin, stepped down to cephalexin QID PO on discharge
- Initial consult was 15th June but the patient was then discharged on the 16th. Therefore, was unable to follow up
- Returned to ED 3 days later as dressing were unable to be removed by the GP
- Then admitted to Hospital in the home service (HITH). PICO 14 sNPWT was applied in this setting by the end of June 2020.
- Followed up continued in HITH twice weekly
- PICO 14 sNPWT ceased 5 weeks later and changed back to DURAFIBER◊ Ag Absorbent Gelling Silver Fibrous Dressing with and a silicone foam dressing

Wound challenges and management objectives

- The main challenge for this wound was, as with all elderly patients, slow wound healing. The challenge for this patient in terms of the wound itself was recurrent cellulitis and local wound infection leading pain swelling and a buildup of devitalised tissue. Fortunately this was brought under control with oral antibiotics and cleaning with a super oxidised solution. The need to close this wound as quickly as possible to minimise infections was the main goal
- Dressing changes were carried out 2 x per week necessitating returns to hospital
- My goal was to reduce the wound as much as possible within 4 weeks so that it would not be an encumbrance for the patient's ALD's

Treatment

- Initial dressing plan was to use a Hydrofiber™ and a silicone foam dressing. This was used to help remove the necrotic burden as well as be gentle for dressing changes
- PICO 14 sNPWT was commenced end of June and then changed on 1st review 2 days later. The short turn around was deliberate to assess the level of exudate as well as to accommodate for the weekend and minimise risk of dressing failure.
- Dressings were then changed 2 x per week. Initially there was slough build up and cellulitis remained despite oral A/B's
- Cleaning consisted of the use of super oxidised solution and mechanical debridement with gauze and the back of a scalpel blade occasionally
- On the 10th July, nil PICO 14 sNPWT available for continuation of NPWT therefore the wound was dressed with DURAFIBER Ag and a silicone foam
- PICO 14 sNPWT recommenced on the 14th to help speed up granulation and epithelialisation.
- Over the next two weeks the wound continued to improve however the patient experienced some Moisture Associated skin damage (MASD) due to leakage of fluid (from small breaks in the skin) under the silicone border and film strips. These were treated with a skin barrier film and Hydrofibre™ which managed the issue
- The PICO 14 sNPWT was applied for over 14 days and the pump allowed to expire whilst the patient was at home. The wound was then reviewed at the next scheduled dressing change

Treatment outcome and results

- The end result was positive with an overall 81% reduction in wound size in slightly over the aimed 4 week period
- We were able to achieve this amount of wound closure despite initial ongoing infection. The dressing itself remained safe to use even when the negative pressure aspect was eliminated due to expiry of the pump
- Our patient was happy with the size and weight of the pump which made it easier for her to be very compliant with her treatment
- There was some itchiness experienced under the dressing along with some MASD due to fluid leaks and oedema

Discussion and conclusions

- Skin tears are a regular occurrence for the elderly with a prevalence rate of up to 22% in the hospital setting
- For this case, the PICO 14 sNPWT was very effective at reducing the wound size, managing the exudate, whilst maintaining patient comfort
- *"Overall, the PICO 14 System is a very useful addition to one's disposable NPWT quiver. The 14 days provided is enough time to ensure that a wound is progressing in the right direction however a longer period of time for chronic wounds such as this case study would be beneficial. The ability to cater for a wound depth of up to 7cm is what sets it apart from the others."*

Continued on next page

PICO◊ 14 sNPWT evaluation – skin tear (cont)

Thomas Leong CNC (Skin Integrity & Wound Management) - *RPAH Sydney (Australia)*

Figure 1
15th June 2020 -
Initial wound size was 30.29cm² surface area as measured with Tissue Analytics App

Figure 2
23rd June 2020 -
There was an actual significant wound size increase when the PICO 14 sNPWT was commenced (43.74cm²)

Figure 3 and 4
26th June 2020 -
Obvious tissue death/slough buildup related to ongoing infection

Dressing appearance on the first change

Upon dressing removal

Figure 5 and 6
After 2 weeks of treatment with the PICO 14 sNPWT, wound size was reduced to 33.26cm² as measured with Tissue Analytics

Post wound cleansing and debridement

7th July 2020

Figure 7
14th June 2020 -
Dressed with DURAFIBER◊ Ag on the 10th July 2020 and PICO 14 sNPWT was recommenced on the 14th July 2020 (19.18cm²)

Figure 8
21st July 2020 -
(11.53cm²)

Figure 9
24th July 2020 -
(10.46cm²)

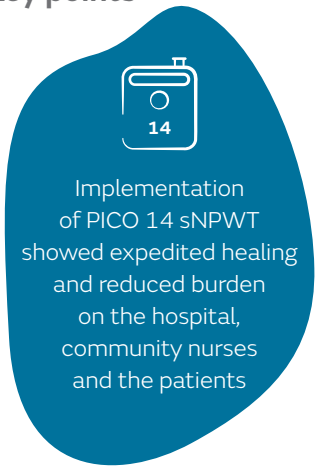
Figure 10
7th August 2020

Figure 11
31st August 2020 -
The dressing was changed to a more conservative dressing of DURAFIBER Ag and a silicone foam, changed weekly (5.75cm²)

Evaluation of PICO◊ 14 sNPWT in outpatient setting – split thickness skin grafts

Harriet Apted (Registered Nurse, Practice Nurse for Dr Dan Rowe, Brisbane Hand and Plastic Surgery) - *(Australia)*

Key points



Implementation of PICO 14 sNPWT showed expedited healing and reduced burden on the hospital, community nurses and the patients

PICO 14 sNPWT provides 14 days of treatment to help ensure enough time for a wound to progress in the right direction

All patients reported great satisfaction with being able to remain at home for post-op treatment and the simplicity of care for the period PICO 14 sNPWT was *in situ*

Introduction

The three patients were aged between 72 and 84 years (median age = 78), one of whom was a female and two were male. All skin grafts were implemented as a result of excisions of skin cancers, where the absence of sufficient skin to facilitate direct closure or a flap dictated that a skin graft was to be applied to the defect for healing via primary intention. All patients had sufficient mobility and support at home, avoiding the need for an inpatient stay, benefiting both the patient personally and the hospital financially.

Patients

Patient A – 79 year old female, nil relevant co-morbidities; mobilising in wheelchair for three weeks due to location of wound; split skin graft to right achilles measuring approx. 5cm x 5cm.

Patient B – 84 year old male, history of bowel cancer (ileostomy); independent mobilisation; split skin graft to left lower anterior leg measuring approx. 4cm x 4cm.

Patient C – 72 year old male, nil relevant co-morbidities; independent mobilisation; split skin graft to left pretibial measuring approx. 5cm x 5cm.

Wound challenges and management objectives

- Skin grafts require a unique set of circumstances to heal, in that they require external suppression of the inflammatory response of the body following injury in the form of compression as well as minimal mobilisation. There tends to be little to no clinical impact of the wound on the body systemically but this can also play into the psychosocial aspects of the wound; as the patient is otherwise feeling 'well', the need to maintain what is essentially bed rest at home can be challenging for the patient. This can lead to social isolation and loss of muscle tone leading to impaired mobility and falls
- Previously, with patients undergoing split skin graft with PICO 7 sNPWT +/- an inpatient stay, from data collated by the authors following 9 patients, showed healing averaged at 5.88 weeks
- The objective of this trial was to ascertain if extended negative pressure wound therapy expedites the healing process, lessening burdens on patients, hospitals, community nurses, and specialist practitioners

Treatment

- The method used in split skin grafting as performed by Dr Dan Rowe involving an upper lateral thigh donor site (usually on the same side of the body as the graft is being performed) to repair the defect created by excising a skin cancer with adequate margins. The skin is then perforated and secured to the defect with a synthetic absorbable copolymer suture (Vicryl Rapide™ from Johnson and Johnson)
- Due to the bed rest and leg elevation being mandated to ensure angiogenesis and tissue proliferation between the defect and the skin graft, if the patient has limited support at home, poor peripheral vascularity or a challenging graft location (i.e. heel or foot), they may require an inpatient stay with RENASYS◊ Negative Pressure Wound Therapy System (Smith+Nephew) for 5-10 days prior to discharge with PICO sNPWT. This allows for closer monitoring and an increased chance of graft take in these more challenging cases. Prior to discharge home, a PICO dressing is usually applied to allow increased mobilisation whilst also maintaining negative pressure wound therapy and associated healing benefits. This was not the case for any of the patients in this case study
- With both PICO 7 sNPWT and 14, a dressing change is conducted at approximately halfway through the pumps duration. ACTICOAT◊ Antimicrobial Barrier Dressing (Smith+Nephew) is applied as the primary interface dressing; this has been noted by the authors to improve outcomes for lower limb skin grafts generally
- Following cessation of negative pressure wound therapy at around day 14, decisions are made with regards to the ongoing wound care but would usually entail daily dressing changes with BACTIGRAS◊ Medicated Tulle Gras (Smith+Nephew) as primary interface, an absorbent dressing (either MELOLIN◊ Low Adherent Absorbent Dressing Pads or Mesorb™ depending upon the volume of exudate from the wound) and two heavy Tensocrepe™ (BSN medical) bandages in a figure eight technique from toe to knee
- The patient is seen in the specialists rooms by the practice nurse one week after the commencement of daily dressings and then fortnightly thereafter until deemed healed by practice nurse and Dr Rowe. As mentioned, the authors would usually estimate a healing trajectory of six weeks when using either PICO 7 sNPWT or 'conventional' dressings
- Complicating factors in graft healing include most often a non-compliance of the patient with rest and elevation, resulting in graft loss and thus an extended healing trajectory whilst the partially healed grafts continue to heal by secondary intention (epithelialisation from the wound edges). Venous insufficiency is an additional factor leading to the same outcomes.

Products used

- This trial used PICO 14 sNPWT in conjunction with ACTICOAT FLEX 7 Dressing. A comparison will be made with the PICO 7 sNPWT.
- Other dressings used following the PICO 14 sNPWT included:
  - BACTIGRAS Dressing
  - MELOLIN Pads
- Mesorb™ (Molnlycke)
- HandyCrepe Heavy T™ (BSN Medical)
  - Tubular-Band Retention Bandage™ (Sutherland Medical)

Continued on next page

Evaluation of PICO◊ 14 sNPWT in outpatient setting – split thickness skin grafts (cont)

Harriet Apted (Registered Nurse, Practice Nurse for Dr Dan Rowe, Brisbane Hand and Plastic Surgery) *(Australia)*

Patient A

Case presentation

This case study followed the progress of a 79 year old female who underwent a split skin graft to her right achilles following excision of a skin cancer, aided in healing by the application of negative pressure wound therapy in the form of PICO 14 sNPWT. This apparatus was applied to the skin graft at the time of repair in conjunction with two other cases, with all procedures completed as day surgeries at the participating hospital. Patients were then followed through in the surgeon's private rooms by the surgeon and practice nurse until the wound was deemed healed. In this context, 'healed' is taken to mean that the skin graft is well-taken enough to tolerate cessation of compression bandaging and no longer requires wound care dressings.

Treatment outcome and results

- This participant's 5cm x 5cm split skin graft was fully healed at five and a half weeks postoperatively. At the time of consultation, the patient reported no exudate from the wound for one week previously, implying minimal need for wound care dressings and actual time to healing of four weeks. At this time, the authors ceased all wound care. At five and a half weeks, BACTIGRAS◊ Medicated Tulle Gras, MELOLIN◊ Low Adherent Absorbent Dressing Pads and compression were ceased, having been used since cessation of PICO 14 sNPWT
- In Figure 4, significant maturation of the graft is noted. At no point was there any concerns regarding graft loss for this particular patient. All participants reported great satisfaction with being able to remain at home during the entire process and the simplicity of care during the period of time the PICO 14 sNPWT was *in situ*

Figure 1
PICO 14 sNPWT change one week postoperatively showing good progress for revascularisation and adherence to the wound bed

Figure 2
PICO 14 sNPWT cessation at two weeks postoperatively showing excellent progress towards healing – often not seen until week three or four

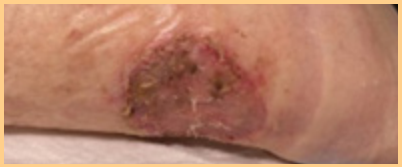


Figure 3
Progress check at three weeks postoperatively

Figure 4
Final check at five and a half weeks post-operatively showing complete healing and no longer requiring dressings

Patient B

Case presentation

This case study followed the progress of an 84 year old male who underwent a split skin graft to his left anterior lower leg following excision of a skin cancer, aided in healing by the application of negative pressure wound therapy in the form of PICO 14 sNPWT was applied to the skin graft at the time of repair in conjunction with two other cases, with all procedures completed as day surgeries at the participating hospital. Patients were then followed through in the surgeon's private rooms by the surgeon and practice nurse until the wound was deemed healed. In this context, 'healed' is taken to mean that the skin graft is well-taken enough to tolerate cessation of compression bandaging and no longer requires wound care dressings.

Treatment outcome and results

- This patient, with his 4cm x 4cm split skin graft, also had an outstanding result. His graft was healed within four weeks, though did have some complications. Some moderate congestion was noted at one week post operatively, which can lead to graft loss at times but it could be said another week of negative pressure wound therapy may have abated this. BACTIGRAS Dressing was implemented as this graft's primary interface dressing after cessation of PICO 14 sNPWT
- Mesorb™, a highly absorbent cellulose pulp dressing, was implemented upon commencement of daily dressing changes at two weeks postoperatively, due to moderate-severe haemoserous exudate throughout the duration of the PICO 14 sNPWT. This was devised to be due to a lymphatic vessel at the 4 o'clock aspect of the wound. This was done in an effort to avoid maceration and maintain the integrity of the donor skin. This was achieved, however, a minor infection occurred at three weeks postoperatively, for which antibiotics were prescribed with good result. This may have been due to the slightly more moist nature of the wound bed, encouraging colonisation of bacteria

Figure 1
PICO sNPWT change at one week postoperatively

Figure 2
PICO sNPWT cessation at two weeks postoperatively showing a vast improvement in vascularisation

Figure 3
Progress check at three weeks postoperatively showing some minor purulent discharge and increased oedema to the wound edges

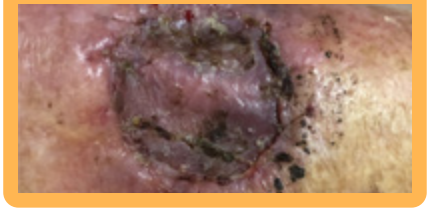


Figure 4
Final check at four weeks postoperatively (photo supplied by patient) showing a healed graft no longer requiring dressings

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1 2 3

Evaluation of PICO◊ 14 sNPWT in outpatient setting – split thickness skin grafts (cont)

Harriet Apted (Registered Nurse, Practice Nurse for Dr Dan Rowe, Brisbane Hand and Plastic Surgery) *(Australia)*

Patient C

Case presentation

This case study followed the progress of a 72 year old male who underwent a split skin graft to his left pretibia following excision of a skin cancer, aided in healing by the application of negative pressure wound therapy in the form of PICO 14 sNPWT. This apparatus was applied to the skin graft at the time of repair in conjunction with two other cases, with all procedures completed as day surgeries at the participating hospital. Patients were then followed through in the surgeon's private rooms by the surgeon and practice nurse until the wound was deemed healed. In this context, 'healed' is taken to mean that the skin graft is well-taken enough to tolerate cessation of compression bandaging and no longer requires wound care dressings.

Treatment outcome and results

- This patient, with his skin graft measuring 5cm x 5cm, Some moderate mottled congestion is noted at one week postoperatively, which receded by week two. At week two, some superficial exfoliation of the graft is also noted indicating cell proliferation in the deeper levels. BACTIGRAS◊ Dressing, MELOLIN◊ Pads and compression bandages were the dressing utilised following cessation of PICO 14 sNPWT. This graft was perhaps not as mature as the others in the sample group and this may be due to poor vasculature of the recipient

Figure 1
PICO change one week postoperatively showing good progress for revascularisation and adherence to the wound bed

Figure 2
PICO cessation at two weeks postoperatively excellent progress towards healing – often not seen until week three or four

Figure 3
Progress check at three weeks postoperatively

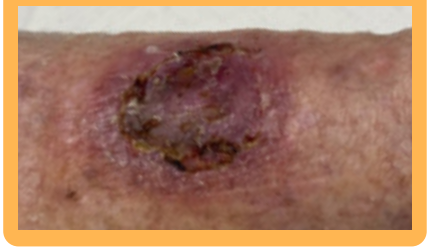
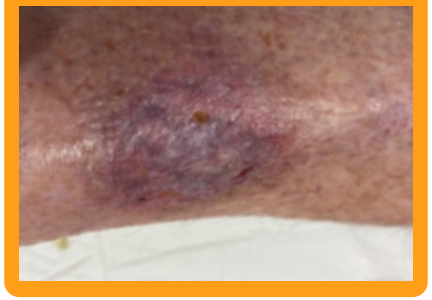


Figure 4
Final check at four weeks postoperatively showing a healed graft no longer requiring wound care dressings



Overall outcome and results

- All three participants were healed at 4 weeks postoperatively, compared to the average 5.88 weeks with the PICO 7 sNPWT (previous unpublished data) which included five of the nine participants having approximately one week of RENASYS◊ tNPWT treatment. Not only does this reduce the time that patients are required to maintain bed rest and undergo wound dressing changes, it relieves community nurses of an extra two weeks of providing care. Two weeks of negative pressure wound therapy out of a total of four weeks as opposed to one week (+/- inpatient stay of one week) out of a total of 5.88 weeks also saves the patient up to three weeks of dressing supplies which can be a substantial financial burden
- These patients had adequate support at home to undergo their graft as day surgery, mobilising at home independently, eradicating any costs for the hospital and private health fund relating to an inpatient stay. With such expedited healing, there is the potential for avoiding an inpatient stay altogether, depending on the location of the wound and the general health of the patient
- The average cost for the rooms did not see any improvement (supplies used related to both PICO 7 sNPWT and 14 costs were ~$20 per patient) and the appointments or time allocation required were approximately the same. However, faster rates of healing with minimal complications as seen in this small pilot sample size imply less time and supplies required over the course of their recovery
- Often, with successful PICO 7 sNPWT grafts, the authors were able to cease compression of the leg at six weeks post-operatively. In view of these promising results, it may be possible to foreshorten the duration of compression from six weeks to four weeks, improving patient satisfaction and again decreasing the burden on community nursing resources

Discussion and conclusions

- The implementation of the PICO 14 sNPWT showed expedited healing, as well as lessened burdens on the hospital, community nurses, and the patients. From a financial perspective, hospitals, private health funds and patients all benefit by avoiding an inpatient stay, and having to provide or undergo fewer postoperative dressings, but maintain excellent outcomes. Patients also see an improvement in quality of life when able to cease bed rest sooner. Additionally, from a monetary point of view, the patient's wound is healed sooner meaning fewer supplies needing to be purchased for wound care. Community nurses and hospitals are able deploy resources to other patients, as our demands on their time are lessened. In this small sample group, 100%of participants achieved full graft take, whereas the PICO 7 sNPWT sample group showed only 66% of participants with the same results
- *"The benefits of the implementation of the PICO 14 sNPWT used in partnership with other wound care dressings from Smith+Nephew throughout the healing process are many and varied but the group that sees the most benefit are our most important clients – the patients – who see improved outcomes in healing, decreased financial burden, accelerated return to normality."*

Using PICO◊ 7 Single Use Negative Pressure Wound Therapy (sNPWT) on a surgical wound dehiscence

Sharon Lloyd (District Nurse Team Leader) - *Birmingham Community Health Care NHS Foundation Trust (UK)*

Key points

PICO 7 sNPWT assisted in reducing wound size by 84% after 2 weeks

Reduced nursing visits

2 weeks

Following 2 weeks of PICO 7 sNWPT the wound was closed and fully epithelialised

The author would like to thank Jacqui Hughes, Clinical Excellence Manager at Smith+Nephew for supporting the medical writing of this case study.

Overview

Surgical wound dehiscence is a significant issue that affects many patients and is widely under reported. The impact of surgical wound dehiscence can be considerable: increased mortality, further surgery, delayed adjuvant treatment and impaired psychosocial wellbeing.[1] If there are treatment options to reduce this burden then they are worthy of investigation.[2]

Case presentation

The patient underwent emergency laparotomy surgery only to suffer with a wound dehiscence due to a wound complication. While the patient was in hospital the wound dehiscence was treated with traditional negative pressure wound therapy (tNPWT) but the desired clinical outcome was not achieved. At this point tNPWT was stopped.

When the patient was at home the district nurses visited daily. The wound was managed with Hydrofiber™ and pad.

To facilitate rapid wound closure, prevent further complications (i.e. wound infection) and to reduce nursing visits it was deemed appropriate that to use PICO 7 sNPWT with a negative pressure wound therapy gauze wound filler to help kick start wound healing.

Wound challenges and management objetives

The wound was in close proximity to the patient's stoma, making it difficult to create a seal with the dressing used initially when patient was sent home from hospital. Originally the wound dressings were changed daily but after PICO 7 sNPWT was commenced dressing changes reduced to twice weekly and subsequently once a week thereafter.

Treatment

At the first assessment, the wound had full granulation tissue present in the wound bed and measured 5cm x 4cm (20cm^2) with a 4cm depth (Figure 1). No signs of wound infection were present and there was no undermining. The Tissue Viability Nurse decided to use PICO 7 sNPWT due to its ability to help facilitate wound closure.

A PICO 7 sNPWT 15 x 20cm dressing was applied with negative pressure gauze wound filler to fill the wound cavity. The use of RENASYS◊ Gel Adhesive patch was also used to facilitate the seal around the patient's stoma. The PICO 7 sNPWT dressing was changed twice a week.

After 1 week of PICO 7 sNPWT the wound responded positively with an increase in granulation tissue and tissue approximation. Due to the reduction in depth, subsequent PICO 7 sNPWT applications did not need the use of a wound filler. To facilitate undisturbed healing and reduce potential contamination, the dressing was left in situ for 7 days.

After 2 weeks of PICO 7 sNPWT the wound had come up to surface and measured 2cm x 1.6cm (3.2cm^2; Figure 2). This was a reduction in surface area of 84%. The wound was described to have achieved full wound closure with 100% epithelial tissue coverage. This allowed the team to discontinue PICO 7 sNPWT and discharge the patient with an instruction to cover the wound with ALLEVYN◊ GENTLE BORDER Dressing for a number of days to protect the fragile area from potential trauma.

Outcome and conclusions

After two weeks of PICO 7 sNPWT treatment the wound had completely epithelialised and closed. The patient was also able to resume normal activities of daily living due to the wound being healed.

The therapy enabled the nurses to reduce visits to this patient and also the potential detrimental effects of prolonged wound dehiscence.

Early would closure must always be the forefront of every clinicians' mind to prevent further wound complications and allow the patient to return to normal activities of daily living.

Figure 1
Initial assessment -
Wound measurements: 5cm x 4cm x 4cm depth (100% granulation tissue, no undermining and no signs of wound infection)

Figure 2
Wound measurements: 2cm x 1.6 cm with 100% epithelial coverage. Full wound closure

1. World Union of Wound Healing Societies 2018. Consensus document. Surgical wound dehiscence: improving prevention and outcomes. *Wounds Int*. **2**. Hughes J, *et al*. 2021. The burden of dehisced wounds in the community: using early results from a multi-centre service evaluation to propose a standard of care to improve patient outcomes and safeguard woundcare budgets. *Br. J. Healthcare Manag*.

The use of PICO◊ 7 Single Use Negative Pressure Wound Therapy (sNPWT) in the management of a traumatic back wound

Caroline Isack (Practice Nurse), Denise Murphy (Practice Nurse) - *Portishead Medical Group (UK)*

Key points

The application of PICO 7 sNPWT resulted in fewer dressing changes and reduced nursing hours when compared to previous treatment methods

The application of PICO 7 sNPWT contributed to healing

The patient described an improvement in their quality of life when PICO 7 sNPWT was applied

Introduction

Downstairs falls frequently occur in the home and often feature multiple injuries on various parts of the body.[1] In the UK there are an estimated 250,000 non-fatal accidents from stair related incidents, that's a fall on stairs approximately every 90 seconds.[2] Some of these falls will result in traumatic wounds. A traumatic wound is a sudden unplanned injury that can range from superficial to full thickness tissue damage.[3]

Case presentation

The patient is a 54 year old female who was normally fit and well with no previous significant medical history. She fell down the stairs landing on a shoe rack at the bottom of the stairs. The patient attended the Emergency Department, a CT scan was obtained and a decision was made to treat the patient conservatively in the community.

On first presentation to the Practice Nurse Team a V shaped wound was present on the lumbar spine approximately 4cm wide x 1.5cm deep with some rolled edges and undermining, there was extensive bruising to the surrounding tissues but the wound bed appeared clean (Figure 1).

Challenges and management objetives

- Traumatic injury with rolled wound edges and tissue loss
- High levels of wound exudate requiring daily dressings
- Challenges with continuity of care as daily dressings
- Extensive bruising and soft tissue damage caused pain which reduced patient's mobility and impacted wellbeing

Treatment

For the first month the wound was treated with an alginate dressing and during a sloughy period a hydrogel sheet was used to debride the wound bed. During this month visits dropped from daily to 3 times a week. On day 23, the wound appeared clean however had increased in size with further undermining. (Figure 2)

PICO 7 sNPWT was commenced on Day 36 using ACTICOAT◊ FLEX Dressing as a wound contact layer and Kerlix™ gauze as a filler*. To provide continuity of care, dressings were changed twice a week by one of the two practice nurses. On day 45 an unusual appearance to wound bed was noted, the proximal part of wound appeared black (Figure 3). On inspection, the black mass was identified as a foreign body that had not been discovered on CT scan (Figure 4). It was subsequently removed and PICO 7 sNPWT with filler was continued and reviewed twice weekly. The wound continued to be dressed with PICO 7 sNPWT in conjunction with a wound filler twice weekly by the practice nurses where it continued to show a wound size reduction (Figure 5).

Treatment outcomes

Application of PICO 7 sNPWT for a 6-week period resulted in the regeneration and promotion of granulation tissue. The wound progressed to complete healing (Figure 6) and the patient was discharged.

Conclusion

The use of PICO 7 sNPWT enabled a reduction in visits that reduced the resources used by the Practice Nurse Team.

The patient remained positive throughout and was compliant as could see improvement at each dressing change.

"My back was not healing and I was offered the PICO sNPWT machine to be honest I didn't think it would work as the nurses tried everything to get my back to heal and it wouldn't. The first week I wore the machine we couldn't believe the improvement on my back, it started healing I was totally shocked and I am so grateful that I was given the chance to use it."

Continued on next page
1 2

*ACTICOAT FLEX 3 and FLEX 7 are only approved for use with NPWT for up to 3 days.

1. Blazewick DH, *et al.* Am J Emerg Med. 2018;36(4):608–14. **2.** BS 5395-1:2010 British Standards Institution, 2020. **3.** Wound Care Made Incredibly Easy, 2nd Edition. Lippincott Williams & Wilkins.

The use of PICO◊ 7 Single Use Negative Pressure Wound Therapy (sNPWT) in the management of a traumatic back wound

Caroline Isack (Practice Nurse), Denise Murphy (Practice Nurse) - *Portishead Medical Group (UK)*

Figure 1
Taken on first presentation to Practice Nurse Team
Day 0

Figure 2
Day 23

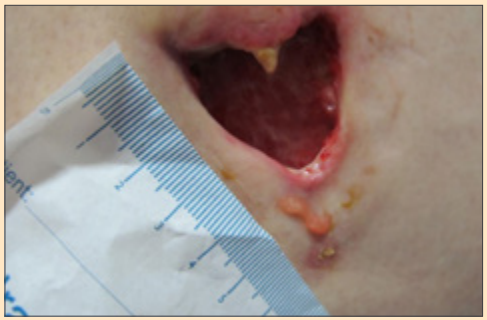


Figure 3

Figure 4

Figure 5
Foreign body not detected on CT scan r emoved from wound

Figure 6
Complete closure of the wound
Week 12

Outcomes may vary

PICO◊ dressing applied on traumatic right hand wound

Dr Poichotte - *Orthopaedic Surgery, Challans Hospital (France)*

Key points

PICO sNPWT was used to help speed up recovery in order for the patient to have his coronary bypass surgery in time

PICO dressing helped with the management of the volume of exudate and preservation of the peri-wound area

Application of PICO sNPWT is quick and easy, allowing nurses to learn quickly and providing treatment outside of hospital

Patient

A 49 year-old male.

- Diabetic
- Scheduled to undergo a triple coronary bypass

Lorry driver, right-handed, awaiting coronary bypass surgery, with a complex wound secondary to trauma inflicted by lawn mower blade.

- Wound: first metacarpal open fracture with sectioned extensor digitorum longus and abductor pollicis muscles, and an oblique skin flap. No vascular or nerve injury
- Operative decision: Wound dressing, tendon repair suture, metacarpal screw osteosynthesis and flap repositioning

PICO sNPWT treatment methodology

Three weeks post-surgery, the wound was still oozing, with flap necrosis significantly delaying heart surgery.

It was decided to apply a PICO System to speed up the healing process.

The size of the PICO dressing used was 10 x 30cm.

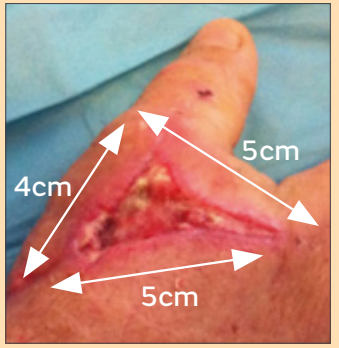
Course of treatment with the PICO sNPWT

- Debridement of necrotic and fibrinous tissue at each dressing change
- Wound cleansing with saline
- Twice weekly dressing changes by the private nurses appointed by the Hospital-at-Home service
- The PICO System is quick and intuitive to use, making it easy for private nurses to learn
- The PICO dressing controls the volume of exudate, and preserves the peri-wound skin
- Near-complete wound healing was observed by D10

Results

Near-complete healing at day 14 in a patient awaiting admission to Cardiac Surgery for a triple coronary bypass.

Day 0

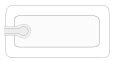


10 x 30cm dressing size

Day 6

Day 10

Ordering information

		PICO◊ 7 device +1 dressing	PICO◊ 7 device +2 dressings	PICO 14 device +2 dressings	Multipack with 5 dressings	PICO 7Y device +2 dressings
Dressing	**Sizes**	**Code**	**Code**	**Code**	**Code**	**Code**
	Multisite small 15cm x 20cm	66802010	66802000	66802040	66802020	–
	Multisite large 20cm x 25cm	66802011	66802001	66802041	66802021	66802031
	10cm x 20cm	66802012	66802002	66802042	66802022	–
	10cm x 30cm	66802013	66802003	66802043	66802023	–
	10cm x 40cm	66802014	66802004	66802044	66802024	–
	15cm x 15cm	66802015	66802005	66802045	66802025	–
	15cm x 20cm	66802016	66802006	66802046	66802026	–
	15cm x 30cm	66802017	66802007	66802047	66802027	–
	20cm x 20cm	66802018	66802008	66802048	66802028	–
	25cm x 25cm	66802019	66802009	66802049	66802029	–

Consumables

Dressing	Sizes	Code
	Foam dressing filler 10cm x 12.5cm	66801021
	5 Antimicrobial Gauze Rolls 11.4cm x 3.7m + 1 SECURA◊ NSBF Wipe	66802127

For detailed product information, including indications for use, contraindications, precautions and warnings, please consult the product's applicable Instructions for Use (IFU) prior to use.

Acknowledgements

Department of Trauma and Orthopaedic Surgery
De Liria Hospital (Valencia - Spain)
- Dr Daniel Herrero (Assistant Specialist)

Department of Obstetrics and Gynaecology
Móstoles University Hospital (Madrid - Spain)
- Dr Noemí Gómez Bermejo (Specialist Physician)

Reina Sofía University Hospital (Córdoba - Spain))
- Dr Antonio de la Torre (Gynaecologist)
- Dr Elena Marín (Gynaecologist)
- Ms Concepción Navarro (Nursing Supervisor)

Department of Cardiac Surgery
University General Hospital Gregorio Marañón (Madrid - Spain)
- Dr Ángela Irabien Ortiz (Resident)
- Dr Álvaro Pedraz Prieto (Resident)
- Dr Hugo Rodríguez-Abella González (Assistant)

Clinique Louis Pasteur - Louis Pasteur Hospital
(Essey les Nancy - France)
- Dr Adrien Jacquot
- Dr Frank Wein
- Dr Thomas Goetzmann

Wound and Diabetic Foot Unit Department
of General and Surgery and Gastroenterology
V. Arrixaca Clinical University Hospital (Murcia - Spain)
- Sonia Almansa Saura (RN)
- Inmaculada Romero Sánchez (RN)
- Mónica Rodríguez Valiente (RN)
- Patricio Alcaraz Lorente (Specialist Physician)
- Teresa Soria Cogollos (Specialist Physician)
- Gregorio Castellanos Escrig (Head of Department)

Colorectal Unit
Ramón y Cajal Hospital (Madrid - Spain)
- Dr Pedro Abadía Barnó (General Surgeon)
- Dr Juan Diego Pina (General Surgeon)
- Dr Javier Die Trill (General Surgeon)

Virgen de las Nieves University Hospital (Granada - Spain)
- Dr Antonio Rodriguez Oliver
- Dr Aida González Paredes
- Dr María Teresa Aguilar Romero
- Dr José María Puerta Sanabria

Private practice (Jaén - Spain)
- Dr Joaquín Navarro Cecilia (Cosmetic and Plastic Surgeon)

Department of Urology
Virgen de las Nieves Hospital (Granada - Spain)
- Dr Fernando Vázquez

Sant Joan de Martorell Hospital (Barcelona - Spain)
- Dr Mireia Sanz (Vascular Surgery)
- Dr Diego Sisa (Vascular Surgery)
- Mercè Centelles (Wound Care Nurse)

Vascular and Thoracic Surgery
Polyclinique de Cholet - Cholet Polyclinic (Cholet - France)
- Dr Olivier Szymoniak

Hospital in the Home Patient (HITH)
(Queensland, Australia)
- Jennifer Garrett (Wound Care Clinical Nurse)

Sant Joan de Déu Hospital (Barcelona - Spain)
- Gemma Pérez (Nurse)

Outpatient Department, Trauma and Orthopaedic Surgery
Sabadell Clinic Hospital (Sabadell - Spain)
- Mr Francesc Zamora Carmona (Nurse)
- Ms Helena Costa Ventura (Head)
- Dr Mònica Salomó Domènech (Trauma and Orthopaedic Assistant Physician)

Parc Taulí University Hospital (Sabadell - Spain)
- Dr Jordi Bombardó (Colorectal Surgeon)
- Ms Marta Fernández (Nurse)
- Ms Eva Ángeles Sánchez (Nurse)

Skin Integrity & Wound Management
Royal Prince Alfred Hospital (Sydney - Australia)
- Thomas Leong (CNC)

Brisbane Hand and Plastic Surgery - Private (Australia)
- Harriet Apted (Registered Nurse, Practice Nurse for Dr Dan Rowe)

Orthopaedic Surgery Challans Hospital (Challans - France)
- Dr Poichotte

Healthcare United (Victoria - Australia)
- Chloe Jansz (Nurse Practitioner/CDE, Nursing Service Director)
- Ashleigh Nichols (Wound Consultant)

University Hospitals Birmingham NHS Foundation Trust
(Birmingham - UK)
- Cheri Pearce (Tissue viability nurse)

Wound Wise Consulting & Education (Victoria - Australia)
- Melinda Brooks (Nurse Practitioner Wound Management)

Shropshire Community Health NHS Trust (Shropshire - UK)
- Pam Lloyd (Tissue Viability Nurse)

Birmingham Community Health Care NHS Foundation Trust
(Birmingham - UK)
- Sharon Lloyd (District Nurse Team Leader)

Portishead Medical Group (UK)
- Caroline Isack (Practice Nurse)
- Denise Murphy (Practice Nurse)

Berkshire Healthcare NHS Trust (Berkshire - UK)
- Nicola Crouch (Wound Care Specialty Nurse)

Shrewsbury and Telford Hospital (UK)
- Clare Wesley (Clinical Lead Nurse Tissue Viability)

North East London NHS Foundation Trust (London - UK)
- Nadine Price (Care Pathway Lead for Acute Podiatry)

University Hospital Limerick (Munster - Republic of Ireland)
- Helen Meagher (RANP Tissue Viability)
- Jean Sheehan (CNS Tissue Viability)

Tissue Viability
Naas General Hospital, County Kildare (UK)
- Gillian O'Brien (Advanced Nurse Practitioner)

University Hospital Cork, Wilton (Cork - Republic of Ireland)
- Pat McCluskey (Advanced Nurse Practitioner)

Wound Management and Tissue Viability
Dressing Clinic, Mercy University Hospital Cork
(Cork - Republic of Ireland))
- Carmel Quirke (Staff Nurse, RGN H Dip)

Northamptonshire Healthcare Foundation Trust
(Northamptonshire - UK)
- Laura Bushby (Tissue Viability Nurse Specialist)

Midlands Regional Hospital, Tullamore , Co.Offaly
(Offaly - Republic of Ireland)
- Helen Moloney (Tissue Viability Nurse)

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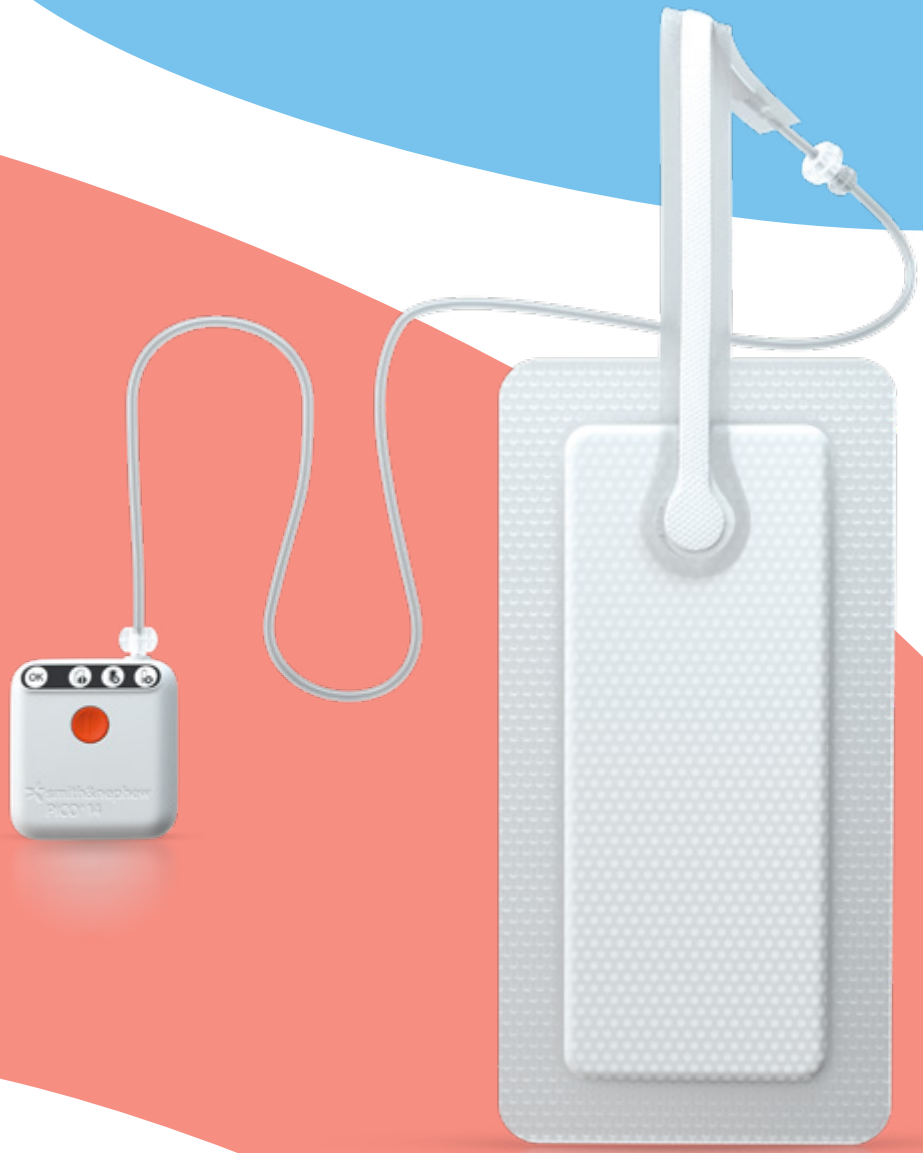

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17410-anz V2 11/23