NPWT in the complex management of pancreato-cutaneous fistula

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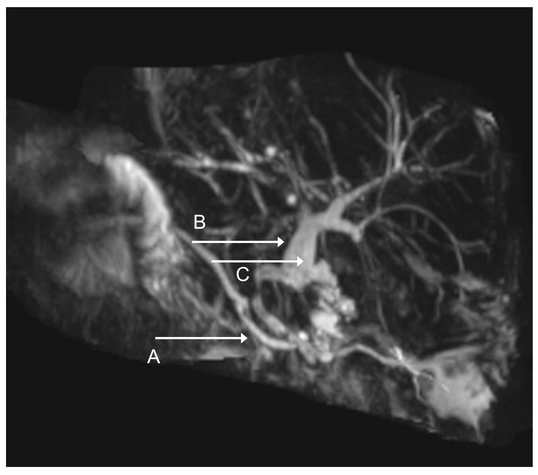
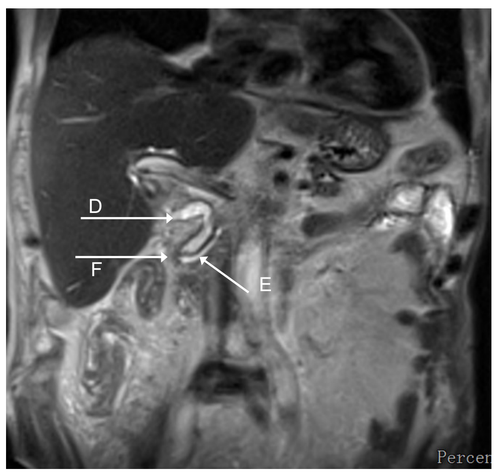
Day 70-75. **High output wound discharge.**
Pancreato-cutaneous fistula.

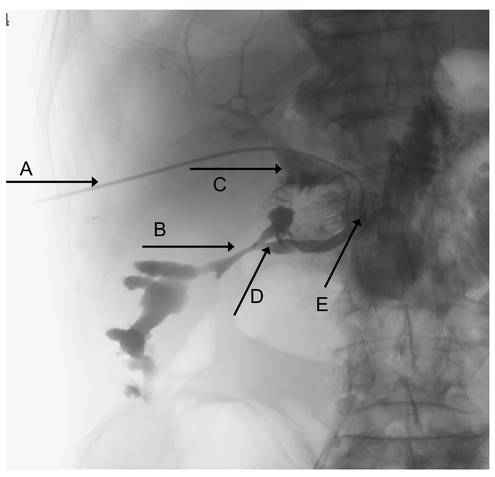
A. Fistula, B. CBD, C. Hepatico-jejunostomy, D. CBD, E. D. Wirsungi, F. Closed papilla Vateri



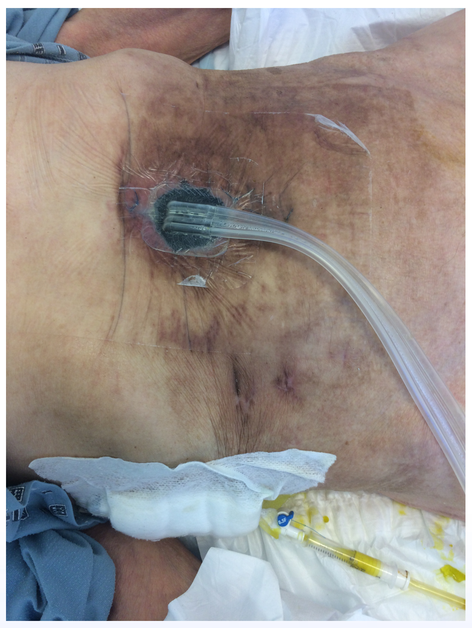


Day 87. **PTD. Pigtail drain placed into common channel.**
Methylene-blue dye injected into common channel drained by NPWT-system.

A. PTD wire. B. Fistula. C. CBD. D. Common channel. E. Hepatico-jejunostomy (intact).



Day 87-108. **Negative pressure gradually decreased from 125 Hgmm to 30 Hgmm.**
Pancreato-cutaneous fistula slowed down and closed.



Day 108. **NPWT removed. Non-discharging, healed midline wound with pink scar tissue almost in skin level.**

Introduction

Pancreato-cutaneous fistula is a severe complication of hepato-pancreato-biliary suergery. Management of the fistula usually involves medical treatment efforts (Somatostatin) as well as surgical interventions. High throughput pancreatogen fistulas are not prone to heal without operative management, such as pancreato-enterostomy formation.

Case

84-year old male

Past medical history:

- Hypertension, Ischaemic heart disease
- **Chronic alcohol depndence**
- Endoscopic bleeding control of stomach **peptic ulcer**
- Bilateral inguinal hernioplasty
- Spinal fracture, spondylosis
- Pertrochanter fracture
- C. diff colitis (2014)

History

07/12/2016. **Huge DU perforation**: emergency suture sec Graham.

Day 5. Suture line **leakage**: Emergency **distal gastrectomy** (Roux-en-Y, Cholecystectomy, SB-GIST resection). ITU: 2 days.

Day 11. Obstructive jaundice.

Day 12. MRCP: **Papilla Vateri closed** probably by staple line.

Day 13. **PTD** insertion. De-jaundiced.

Day 23. Duodenal stump leakage. Th: Salem sump suction. Healed.

Day 31. Laparotomy**.** Hepatico-enetrostomy-Roux. ITU: 5 days.

Day 43. PTD cholangiopgraphy: intact anastomosis, no leakage..
PTD removal 5 days later.

Day 43. **Mid**line wound SSI. Wound opened up.

Day 70. **NPWT on discharging wound.**

Day 73. **Non-healing midline wound, incraesing discharge (up to 400 ml/day). Wound discharge amylase:** 136.910 U/l

Day 75. **MRCP: pancreato-cutaneous fistula from papilla Vateri.**

Day 87. **Re-PTD into common channel. NPWT on midline wound.**

Day 108. **NPWT removed. Midline wound healed.**

Day 115. Discharged to Gastrointestinal Rehabilitation Unit, Kisbér.
(PTD removed on day 122.)

Discussion/Conclusion: Pancreato-cutaneous fistula as a consequence pancreatic duct injuries are well described complications of abdominal surgeries. In our case we report a succesful attempt of a semi-conservative management of a high throughput pancreato-cutaneous fistula. Internal drainage was supplemented with the negative pressure effect, as well as the continous drainage effect of NPWT giving a chance to the skin and subcutaneous soft tissues to close over the fistula. Taking that any operative attempts on our elderly patient was considered to be of fatal outcome risk, NPWT and interventionan radiology technique together was considered to be the ideal solution.

Clinical relevance: NPWT with internal drainage (PTD) were showed to be a feasible and safe alternative of operative management of a high throuhgput pancreato-cutaneous fistula

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Experiences with negative-pressure wound therapy (NPWT) in gram-negative sepsis following Hematopoietic stem cell transplantation

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Day 0-3
Despite fasciotomy, combined antibiotic and aggressive intensive therapy the process has progressed rapidly. A life-threatening condition has been established on the basis of necrotizing fasciitis, it has been decided to perform an amputation at femoral level.

After the initiation of treatment, the intertisular edema has been markedly reduced, the blood circulation of the musculature has remained and necrosis not occurred.

Day 3-15
Already at this time the scar tissue development was started, the edema continued to decrease, the wound secretion volume was 300 ml, which contained detritus.

We applied a silicone mesh as contact medium and continued the NPWT by intermittent manner.

Day 15-21

Irregular cavities in the deeper layers of the femur and muscles were filled with polyurethane foam.

The large surface of the wound, a polyurethane foam was fitted by Hydrofilm cover, which was adapted to the shape of the wound, thereby positioning the entire Vivano Med port draining the whole complex.

Day 21-40

Between sessions of dressing changes 5 and 7 healthy scar tissue has been reached at the skin surface level, there has been no inappropriate overgrowth and the approach of the edges of the skin has been observed.
At the end of the NPWT we applied a silver colloid bandage on the wound surface.

The stump of the femur has healed, is durably free of infection and the patient rehabilitation has proceed.

Introduction
In a 45-year-old male patient with acute myeloid leukemia allogeneic hematopoietic stem cell transplant was performed one year earlier. In this occasion he has been admitted urgently for a severe soft tissue infection. The patient is a carrier of multiple pathogens and in turn is immunosuppressed which thus together predisposing to a septic state.

Case
In the immunosuppressed septic patient the prognosis of the wound healing by default is poor but in any case is prolonged. In order to achieve a reduction of the high bacterial load of the wound contaminated, for the collection of the wound secretion in isolation and its measurement and monitoring, stimulation of wound healing instead of the conventional treatment we have indicated the Negative Pressure Wound Therpy(NPWT)(1,2). In the immunocompromised patient, the absence of the physiological and mechanical barrier can lead to lethal complications.
Throughout the therapy we have applied contact isolation.

Day 0-3:
In the first NPWT treatment cycle we used a *continuous negative pressure with a pressure of 125 mmHg.*

Day 3-15:
After 72 hours was applied the negative pressure *in intermittent mode (-125 mmHg / 4 min and -50 mm Hg / 2 min).*
During each change of dressing we took samples of secretions for *microbiological sensitivity analysis*, which resulted as follows: E.Coli, Enterococcus faecium, Vancomycin Resistent Enterococcus, Proteus mirabilis.
Due to its Adenovirus infection we have applied *adoptive transfer of donor-derived, virus-specific (antigen specific)T cells therapy*.

Day 15- 21:

The quantity of the secretions has diminished notably that we explained by the emptying of the edemas.

Owing to the combined intensive and antibiotic therapy have been performed in combination with clindamycin, vancomycin, gangciclovir, linezolid, carbapenem, foscarnet, micafungin and cidofovir the general condition of the patient has stabilized.

Day 21- 40: Wound Closure

Conclusion
- We have applied the NPWT in total for 22 days.
- We made the dressing changes 7 times, whose medical and nursing time requirement was in total 7 hours. In the same period of treatment with the application of conventional therapy would have required at least 60 changes of bandages.
- *We* are considering that NPWT is most *cost-effective*, but multiple times more advantageous in terms of the infection control than other conventional therapy techniques.
- Despite the difficult circumstances such as leukemia, septic and immunosuppressed state, the NPWT therapy has been effective.
- In the available literature consulted we have not found another reference related to the treatment by NPWT in bone marrow transplanted patient.

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Case: Severe intraabdominal infection after abdominal wall reconstruction by mesh treated with negative pressure wound therapy (NPWT).

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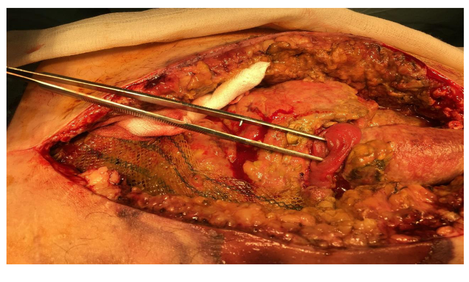
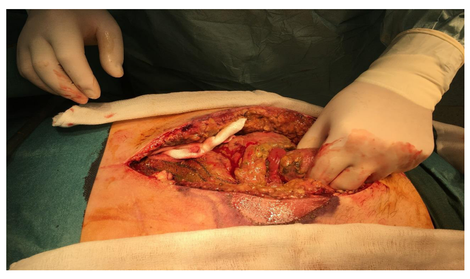
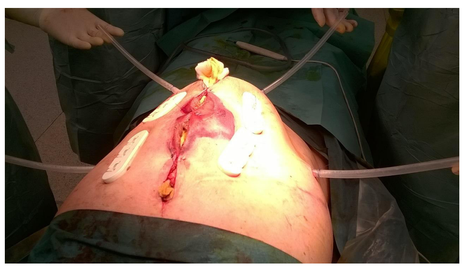
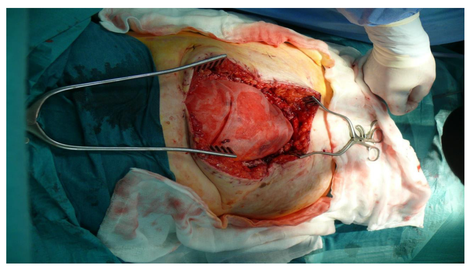


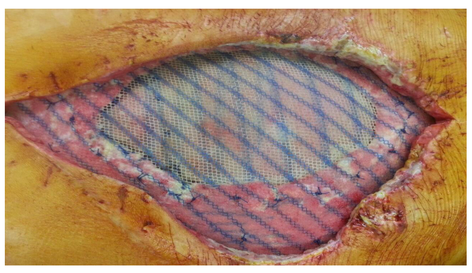


Day 0

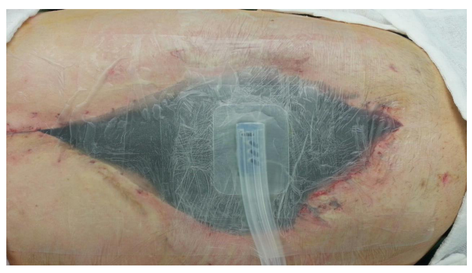




Day 3

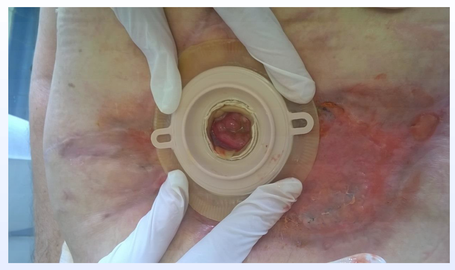


Day 15



Day 26

Day 48



Day 62

Introduction

The optimal surgical technique is mesh implantation in patients with large abdominal wall hernia. After this procedure, the recidive rate is lower than in the case of normal abdominal wall reconstruction. We experienced low rate postoperative complications: seroma or abscess. Since its introduction in clinical practice in the early 1990s negative pressure wounds therapy (NPWT) has become widely used in the treatment of complex wounds. Nowadays, in cases of wound infections, negative pressure wound therapies have become increasingly important.

Case

61-year-old man, who was treated with necrotizing pancreatitis 2 years ago. Last year he was operated on abdominal wall reconstruction with mesh (30x30 cm composite mesh) due to large abdominal wall hernia without any postoperative complications.

5 weeks after hospital release the patient returned with severe sepsis. The reason was the disrupted abdominal wall and mesh which cut one small bowel loop and caused faecal peritonitis with subcutaneous abscess. We reconstructed the small bowel integrity, washed out the abdominal cavity, started antibiotics treatment and evacuated the subcutaneous abscess.

3 days later, we started to use the NPWT abdominal kit, and after it the peritonitis and subcutaneous abscess recovered. We reconstructed the abdominal wall defect with composite mesh and used NPWT.

8 days later we closed the subcutaneous tissue and the skin. Unfortunately, a few days later there was a skin necrosis, but after 8 days the wound proliferation progressed satisfactorily.

7 days later a small bowel fistula evolved in the centre of the wound. We used NPWT and within one week the patient was released from hospital.

4 weeks later the wound proliferation is optimal, the size of the wound is smaller without any inflammatory signs. The patient uses stoma bag.

Conclusion

Abdominal wall reconstruction with mesh is the optimal procedure in cases of large abdominal hernia. A rather rare complication can be a disruption of the mesh, which can cause bowel injury. NPWT has been described as an effective treatment for wounds of many different aetiologies and it is suggested as a gold standard for the treatment of open abdominal and dehisced abdominal wounds. This procedure improves the efficacy of wound treatment and helps reduce the reliance on hospital-based care.

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Our early experiences with NPWT after common surgical procedures

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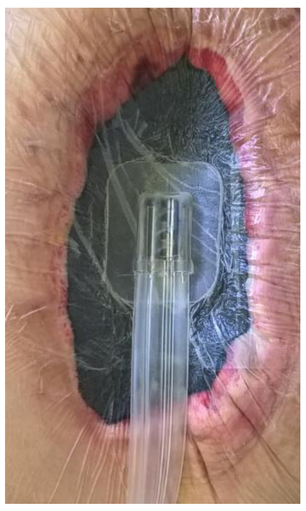
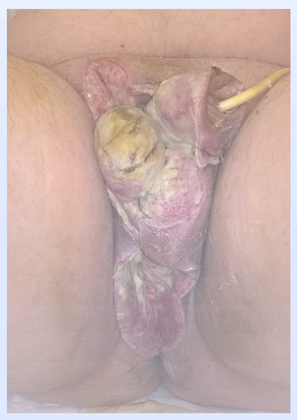
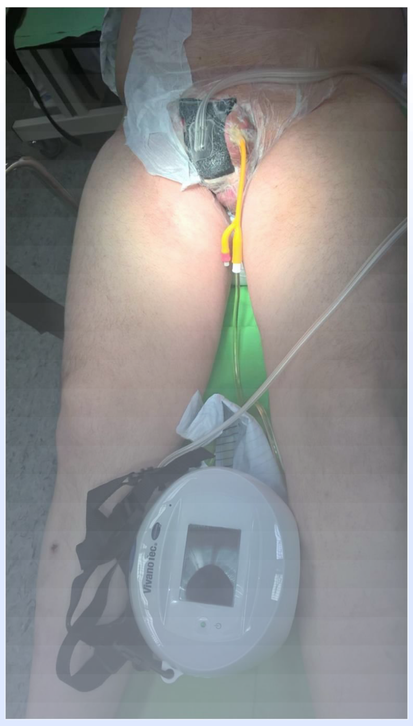
Deep surgical site infection – Case 1

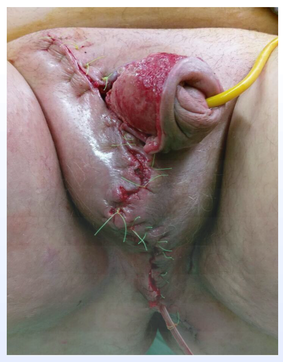


Acute necrotizing fasciitis – Case 2

Fournier's gangrene – Case 3







Introduction

Negative pressure wound therapy is an established modality in the treatment of challenging wounds. The authors, who are surgeons of a city hospital, describe their early experiences with NPWT in three different cases.

Deep surgical site infection – Case 1

A 75-year-old severly-obese patient with a history of type II diabetes was presented with a deep surgical site infection after an open appendectomy for complicated acute appendicitis. Therapy was initiated on continous mode of vacuum besides of de-escalation on antibiotics. We closed the wound after 12 days of NPWT and the patient was discharged home 3 days later.

Acute necrotizing fasciitis – Case 2

A 76-year-old man was hospitalized with pulmonary, prostate and colonic cancer. After an open right hemicolectomy the case was complicated with a necrotic surgical wound. The patient underwent an early sharp debridement, necrectomy for acute necrotizing fasciitis and we started a negative pressure wound therapy with the control of the potential visceral surface. Discontinuation of vacuum therapy was instigated when wound size and tissue fluid were sufficiently reduced that the wound could be managed by conventional dressing. Our patient has passed away later because of his terminal illnesses.

Fournier's gangrene – Case 3

Fournier's gangrene is a form of necrotizing fasciitis that involves tissue of perianal or genital areas. Our third 68-years-old patient with Fournier's gangrene was admitted to ICU with perianal pain and severe sepsis. Following surgery and intensive treatment, his wounds were treated with a difficult topical perineal negative pressure dressing. The treatment was succesfully without colostomy performation and the patient was discharged home with closed wound.

Conclusion

A vacuum assisted closure dressing may be applied after initial wound debridement on various surgical diseases. The technique of application is easy to use and reproductible and suitable to use on perineal region also.

Clinical relevance

Our little Hungarian city hospital's cost-effectiveness analysis and experiences have shown not only the clinical advantages of the NPWT with Hartmann Vivano Technology but also the economic benefits compared to traditional wound dressing on various problems.

Acknowledgements

The authors sincerely acknowledge the participation of the members of the Hartmann Group: Gabor Bezeredi and Janos Moricz.

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LINK for Wound Healing Congress, Belfast, Northern Ireland, 18th - 19th September 2017.

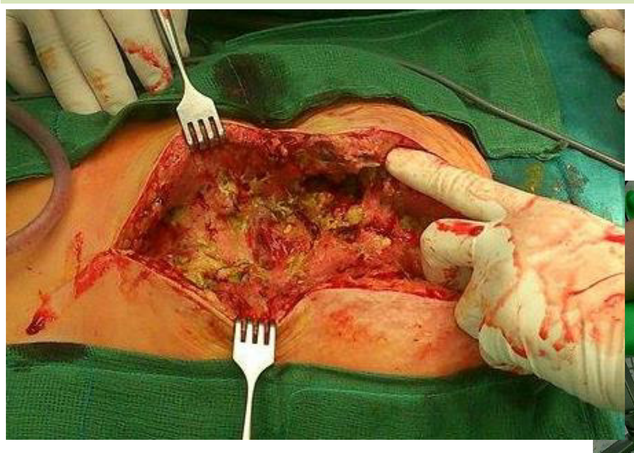
Enteroatmoszférikus fisztula negativ nyomású sebkezelés alkalmazásával- kezdeti tapasztalataink

Susán Zsolt, Győri Ferenc, Damjanovich László, Kovács Dávid Ágoston, Farkas Máté, Deák János, Kóder Gergely, Ötvös Csaba, Csiszkó Adrienn, Tanyi Miklós, Szentkereszty Zsolt

Debreceni Egyetem Klinikai Központ Sebészeti intézet

Eredmények

	1 beteg	2. beteg	3. beteg
Fisztula jellemzői	Egy felszínes Magas kihozatal 1 cm	Egy, mély Magas kihozatal 2 cm	Többszörös, felszínes Magas kihozatal 4 cm-2 cm -2 mm
Kórházi/ Intenzív osztályos tartózkodás	66/6 nap	100 /46 nap	437/107 nap
NPWT tartama/ nyomások	56 nap/ 70 Hgmm	20 nap/ 70-80 Hgmm	40 nap/ 120 Hgmm -80Hgmm
Sztóma zsákkal fedhető a defektus	56 nap után	20 nap után	10 hónap után
Fisztula kihozatal csökkenés	igen	igen	nem
Parenterális táplálás befejezése	43 nap	34 nap	-
Fisztula zárás	Nem történt	Spontán 11 hónap után	Definitív műtét

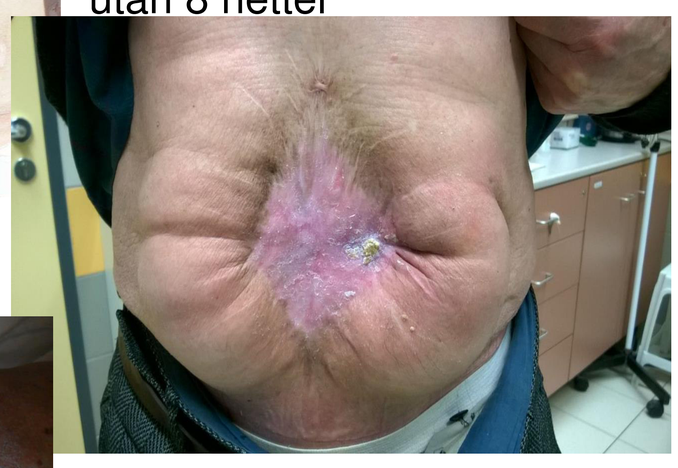


1. beteg: NPWT kezelés

1. beteg:Hasfali tályog, forrása korábbi vékonybél sérülés

1. beteg: NPWT kezelés után 8 héttel

2. beteg:11 hónap után spontán záródott fisztula



3. beteg: 5 hónap után még mindig magas kihozatal

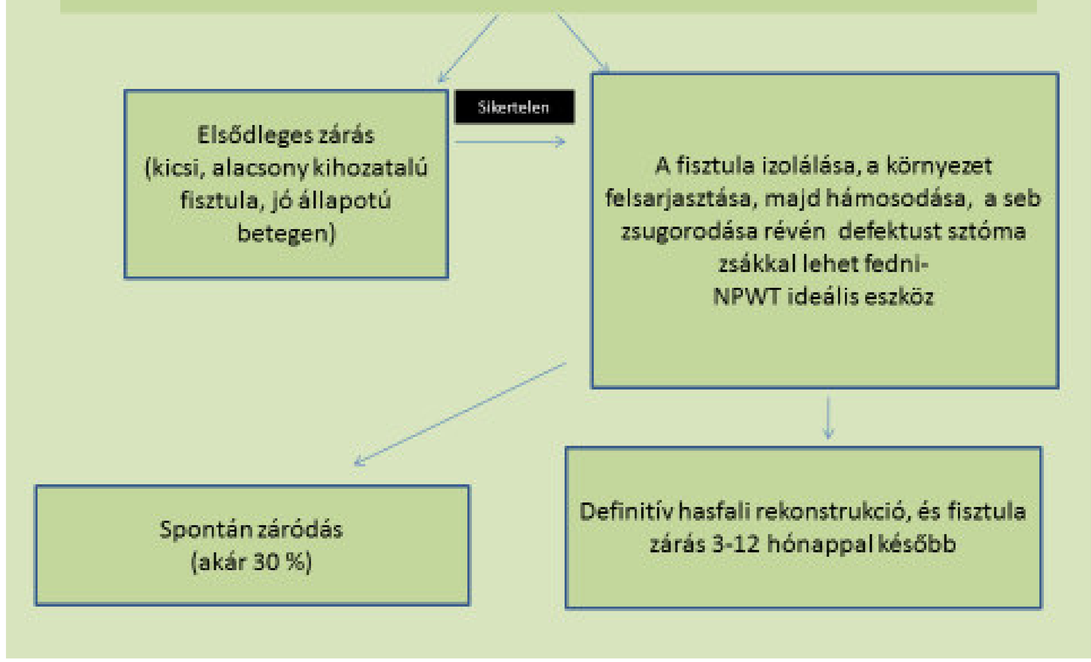
3. beteg:10. Hónap

3. beteg: Fisztula exstirpáció után

Definíció: „frozen abdomen” nyitott hasüreg, laterális hasfali retrakció, kiterjedt összenövések, defektus a bélrendszeren
Björck et al: Amended classification of open abdomen. SJS 2016;105:5-10

Osztályozás:
Kihozatal: alacsony <200 ml/nap; közepes 200-500 ml/nap; magas >500 ml/nap
Anatómiai lokalizáció: proximális (gyomor,duodenum,proximális vékonybél); disztális (disztális vékonybél, vastagbél)
Hasüri lokalizáció: mély, felszínes

Sebészi kezelés algoritmusa



Szupportív kezelés: Multidiszciplináris
Parenterális táplálás
Szepszis kontroll (AB, intervenciós radiológia)
Só, víz, sav-bázis háztartás fenntartása
„Fisztuloklízis”
Pszichés vezetés

Betegadatok

	1. beteg	2. beteg	3. beteg
Életkor-nem	60 éves nőbeteg	75 éves férfi	60 éves férfi
Kísérőbetegség	NIDDM	hipertónia	-
Előző műtétek-sugárkezelés	Abd. hiszterektómia, Hegsérv miatti hasfali sérvműtét	-	Rectum reszekció daganat miatt, posztoperativ kemo-radioterápia
EAF kialakulásához vezető műtétek EAF forrása	Masszív összenövések miatt feladott hasfali sérv műtét Elvarrt vékonybél sérülés	Daganat miatti subtotális reszekció jejuno-jejunosztómia varratelégtelensége Többszri reoperációk	Strangulációs ileus, jejunum reszekció varrat elégtelenség többszöri reoperációk további bélsérülések

Szeptikus sebek kezelése NPWT –val Osztályunkon – esetbemutatások

Dr. Takács Tamás, Dr. Móga Natália, Dr. Lestár Béla PhD.
MH -EK II. Általános Sebészeti Osztály

NPWT indítása (0. nap)

Cserét követően (3. nap)

Cserét követően (7. nap)

Cserét követően (11. nap)

36. nap

60. nap

NPWT indítása (0. nap)

Cserét követően (3. nap)

Cserét követően (6. nap)

Cserét követően (13. nap)

Cserét követően (19. nap)

Transzmisszió előtt (42. nap)

Bevezetés

A szeptikus sebek kezelése időigényes, jelentős kihívást okoz a kórházi személyzet számára. Osztályunk akut megterhelése jelentős, extrém elváltozásokkal gyakran találkozunk.

Az elérhetővé vált NPWT alkalmazásával próbáltuk az Osztályunkra eső terhelés mértékét csökkenteni. Számos alkalommal kezeléseinket siker koronázta, két válogatott esetünket szeretnénk bemutatni.

I. ESET

-63 éves nőbeteg (HT, DM nem ismert), akut felvétel

-Jobb comb medialis elváltozás, ismeretlen kórokozó (mikrobiológia neg.!)

-Két alkalommal műtőben oncotomia

-Felvételt követő 7. napon NPWT mellett döntöttünk

-Összesen 4 alkalommal, 3 -4 naponta végeztünk cserét, ezt követően a beteg kérésére a továbiakban intelligens kötszereket alkalmaztunk

-A vákuumterápia cseréjét az aszepszis, antiszepszis alapvető szabályainak betartásával a betegágyban végeztük

-21 napot követően emisszió, további sebkötözés

-az NPWT indításától számított 60 napon belül per secundam sebgyógyulás

-plasztikai beavatkozás nem történt, a gyógyhajlammal a beteg elégedett volt

(+) igen látványos sebgyógyulás

(+) plusz műtői kapacitást nem igényelt

(-) a beteget a seb elhelyezkedése miatt a vákuumterápia egy idő után mobilizációjában akadályozta, abbahagyását kérte

(-) „learning curve“ elején állandó operatőri készültség

II. ESET

-48 éves férfi (elhanyagolt DM), akut felvétel tarkótáji darázsfészek miatt, súlyos szeptikus állapotban intubálva, lélegeztetve

-bekerülést követően két alkalommal műtőben oncotomia

-felvételt követő 8. napon NPWT mellett döntöttünk,

-5 alkalommal csere (3 -4 naponta), műtői körülmények között

-19. naptól kezdve intelligens kötszerek alkalmazása

-42. napon emissio rehabilitációs osztályra

-plasztikai beavatkozást a beteg nem vállalta

(+) igen látványos sebgyógyulás

(-) a seb elhelyezkedése miatt műtői kapacitás plusz terhére történő beavatkozások

Következtetésünk

Válogatott esetekben a NPWT alkalmazásával látványos eredmények érhetőek el, elérésükhöz gyakran műtői kapacitásra van szükség. A technikában jártas személyzet részéről fokozott készenlétet igényel.

Alkalmazását csak a klinikai kép alapos elemzését követően végezzük.