International Journal of Science and Research (IJSR)
ISSN: 2319-7064
ResearchGate Impact Factor (2018): 0.28 | SJIF (2018): 7.426

Negative Pressure Wound Therapy in an Infected Ventral Meshplasty Cases

Avinash Gonnade[1], Girish Bakhshi[2], Dinesh Pawar[3], Jessicka Shah[4], Geoffrey Kharmutee[5], Shriya[6]

[1]Junior Resident, Department of General Surgery, Grant Govt. Medical College & sir J.J groups of hospital, Mumbai

[2]Professor and Head of unit, Department of General Surgery, Grant Govt. Medical College & sir J.J groups of hospital, Mumbai

[3]Lecturer Department of General Surgery, Grant Govt. Medical College & sir J.J Groups of Hospital, Mumbai

[4]Senior Resident, Department of General Surgery, Grant Govt. Medical College & sir J.J Groups of Hospital, Mumbai

[5]Junior Resident, Department of General Surgery, Grant Govt. Medical College & sir J.J Groups of Hospital, Mumbai

[6]Junior Resident, Department of General Surgery, Grant Govt. Medical College & sir J.J Groups of Hospital, Mumbai

Abstract: ***Negative pressure wound therapy (NPWT) represents as an alternate method of chronic wound management, as the conventional method of daily dressing is time consuming and cause pain and suffering to the patient. We report a case of an infected wound after ventral hernia repair with mesh. Ideally removal of mesh followed by daily dressings is the treatment. However, as her abdominal wall was weak & thin NPWT along with culture sensitive antibiotics were used without removing mesh. This resulted in early healing with healthy granulation tissue. Wound swab became negative for bacteria after 3 sessions of NPWT with minimal discharge. Secondary closure was done with uncomplicated pos toperative course. Follow up of 6 months has shown patient to be disease & symptom free. NPWT is helpful in infected meshplasty cases without the need of removal of mesh. However, more studies will be required to validate this fact***

Keywords: Negative pressure therapy, Infected meshplasty case

1. Introduction

The use of prosthetic mesh in the repair of abdominal wall hernias that occur either due to open or laparoscopic surgery is the gold standard treatment. Mesh repair significantly reduces hernia recurrence by 30 % [1-3]. The use of prosthetic mesh has its main advantage in decreased recurrence rates. However, there may be certain disadvantages like complications such as mesh infection, mesh extrusion, visceral adhesions, and enterocutaneous fistula formation.

The incidence of mesh infection following hernia repair varies from 1% to as high as 7-8%[4-8] and remains a challenging postoperative complication. The recommended treatment for non-absorbable mesh infection is surgical excision of mesh and wound care. It leaves a complex wound over the abdominal wall with weakness of abdominal wall resulting in recurrent hernia.

Negative pressure wound therapy (NPWT) is a newer technique used in the management of wound infection, it was introduced by Argenta and Morykwas. This therapy enhances wound healing by removing excess exudates, providing a controlled moist environment, and promoting neovascularization and granulation tissue formation NPWT involves controlled application of sub-atmospheric pressure to a local environment using a sealed wound dressing connected to a vacuum pump [15]. A sterile black sponge is cut into specific size according to shape, size and depth of the prepared wound. A tube with multiple perforations at one end is placed within the sponge ensuring that the end with perforations remained inside the sponge and the rest taken out through the sponge. The sponge is then placed on the wound just above the mesh; ensuring that the mesh is in firm contact with the underlying wound surface. A transparent occlusive and adhesive dressing is applied over the sponge and the tube is brought out through it making sure that the dressing is airtight. The drainage tube is connected to commercially available portable suction machine or wall mounted suction devices. The negative pressure is set to-100 to- 120 mm Hg during the entire NPWT treatment. Suction is automated at 10 minutes interval.

2. Case Report

A 39 yrs old female came with incisional hernia following exploratory laparotomy done 2 years back. Detailed past history showed that patient had stormy postoperative course due to infection in the wound following which patient had developed swelling. Clinical examination revealed an incisional hernia with defect size of 10 cms x 5 cms in midline with weak & thinned out abdominal wall. She did not have any co-morbidities. She was planned for meshplasty after work up. She underwent open onlay ventral hernia mesh repair following closure of defect with a drain in the subcutaneous region.Drain was removed on postoperative day 10, however, patient developed wound gape after suture removal on post operative day 14 (Fig. 1). Wound was deep and exposing mesh. Patient was initially on conventional daily dressing but there was no significant improvement in wound healing for 1 week .The ideal treatment was to remove the mesh, but as the abdominal musculature was weak & thinned out it was decided along with patients consent to use NPWT along with antibiotics as

per antibiotic sensitivity of wound swab. Patient's wound started showing improvement after first cycle of NPWT (Fig. 2) Hence two more cycles were given (Fig. 3&4). The wound showed healthy granulation tissue.Secondary suturing of the woundwas done (Fig. 5). Postoperative course was uneventful with suture removal done on postoperative day 14. Follow up of 6 months has shown patient to be disease & symptom free.

Figure 1: Wound gape with mesh exposed after suture removal

Figure 2: Wound showing granulation tissue covering exposed mesh after 1st cycle of VAC dressing

Figure 3: Wound showing healthy granulation tissue after 2nd cycle of VAC dressing

Figure 4: Wound after 3rd cycle of VAC dressing

Figure 5: Wound closed with secondary suturing

3. Discussion

Mesh infection after ventral hernia repair is a dreadful complication. This appears as a surgical failure with psychological trauma and financial burden to patient. Infact this is a psychological trauma to the surgeon also. In Conventional method, the infected mesh is removed and the purpose of using prosthesis to strengthen the hernia defect is lost. This may later lead to recurrant hernia. Wound dehiscence after meshplasty exposes the abdominal mesh resulting in formation of biofilm by bacteria which colonize the implant. These microorganisms embedded in biofilms become highly resistant to antibiotics [9], hence the earliest removal of the infected mesh was recommended in order to remove the source of infection.

NPWT by its mechanism of action removes exudates; so if the exudates and the biofilm can be removed by the negative pressure effect then it will be possible to keep the mesh *in situ*. Wolvos in a retrospective study demonstrated reduction in bacterial load and exudates with a decrease in inflammatory markers with vacuum assisted closure instillation [10]. At present, NPWT is an established modality of treatment of acute, chronic and non healing

wounds. It has also proved its utility in patients with compromised healing [11]. Comorbidities such as diabetes, obesity, renal disease, steroid therapy, nutritional deficiency have been associated with increased chances of infection and slow wound healing [7, 12-13]. Stremitzer *et al* in their study suggested conservative management for absorbable or biologic mesh grafts but recommended removal of infected nonabsorbable mesh [14]. In present case as the musculature & sheath was thinned out, it was decided in consultation with patient to give a trial of NPWT with antibiotics initially. This therapy gave good results after first cycles, hence 2 more cycles of NPWT were give. Berrevot et al reported a similar study where NPWT therapy was used to salvage mesh in 60 patients of 63. This study commented that infected large pore meshes could be salvaged by topical negative pressure therapy [15]. In present case small pore mesh could be salvaged which is different from the series of Berrevot.

In present case targeted antibiotics were initiated as per wound swab culture and sensitivity along with NPWT after failure of initial conventional dressings. A total of 3 sessions of NPWT dressing resulted in significant improvement. Patient underwent secondary suturing for wound closure with uneventful postoperative course. Present case study highlights the importance of NPWT in infected meshplasty cases without the need of removal of mesh. However, further studies are required to validate this fact.

References

[1] MacFadyen BV, Mathis CR. Inguinal herniorrhaphy: complications and recurrence. *Semin Laparoscopic Surg.*1994; **1**: 128.
[2] Dabbas N, Adams K, Pearson K, Royle GT. Frequency of abdominal wall hernias: is classical teaching out of date? *J R Soc Med Short Rep.* 2011; **2**: 5.
[3] Hesselink VJ, Luijendijk RW, de Wilt JH, Jeekel J. An evaluation of risk factors in incisional hernia recurrence. *Surg Gynaecol Obstet.* 1993; **176**: 228-34.
[4] Szczerba SR, Dumanian GA, Definitive surgical treatment of infected or exposed ventral hernia mesh. *Ann Surg*. 2003; **237**(3): 437-41.
[5] Delikoukos S, Tzovaras G, Liakou P. Late onset deep mesh infection after inguinal hernia repair. *Hernia.* 2007; **11**: 15-7.
[6] Cobb WS, Harris JB, LokeyJS *et al*. Incisional herniorraphy with intraperitoneal composite mesh; a report of 95 cases. *Am Surg.* 2003; **69**: 784-7.
[7] Petersen S, Henke G, Freitag M *et al*. Deep prosthesis infection in incisional hernia repair: predictive factors and clinical outcome. *Eur J Surg.* 2001; **167**: 453-7.
[8] Falagas ME, Kasiakou SK. Mesh related infection after hernia repair. *Clin Microbiol Infect.* 2005; **11**: 3-8
[9] Cipolla J, Baillie DR, Steinberg SM, Martin ND, JaiK NP. Negative pressure wound therapy: Unusual and innovative application. *OPUS 12 Scientist*. 2008; **2**: 15-29.
[10] Wolvos T. Wound instillation- the next step in negative pressure wound therapy. Lessons learned from initial experiences. *Ostomy Wound Manage*. 2004; **50**: 56-66.
[11] Raad W, Lantis II JC, Tyrie L, Gendis C, Todd G. Vacuum assisted closure instill as a method of sterilizing venous stasis wounds prior to split thickness skin graft placement. *Int Wound J*. 2010; **7**: 81-5
[12] Malone DL, Genuit T, Tracy JK. Surgical site infections: reanalysis of risk factors. *J Surg Res*. 2002; **103**: 89-95.
[13] Arroyo A, Garcia P, Perez F. Randomized clinical trial comparing suture and mesh repair of umbilical hernia repair in adults.*Br J Surg*. 2001; **88**: 1321-3
[14] Stremitzer S, Bachleitner-Hofmann T, Gradl B, Gruenbeck M, Bachleitner-Hofmann B. Mesh graft infection following abdominal hernia repair: risk factor evaluation and strategies of mesh graft preservation. A retrospective analysis of 476 operations. *World J Surg.* 2010; **34**: 1702-9.
[15] Berrevoet F, Vanlander A, Sainz-Barriga M, Rogiers X, Troisi R. Infected large pore meshes may salvaged by topical negative pressure therapy. *Hernia*. 2013; **17**: 67-73.