



## INGUINAL ABSCESS FOLLOWING TRANS-ABDOMINAL PREPERITONEAL MESH REPAIR FOR INGUINAL HERNIA

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### ABSTRACT

**Introduction** – Introduction of synthetic mesh was a landmark breakthrough in management of hernia repair and has significantly reduced recurrence rates. But in addition to benefits, some more problems have come in picture major being 'mesh infection'. Prolene mesh has shown promise when used in abdominal and inguinal hernia repair, especially when used in planned surgeries. Being a foreign material, slightest breach in asepsis can lead to favourable environment for bacterial proliferation and form a 'biofilm'. It appears that laparoscopic hernia repair is a promising method but having chances of mesh infection owing to difficult approach and lack of uniformity in sterilization of laparoscopic instruments. Improper sterilization or protocols might lead to such a large ventral wall sinus or abscess increasing morbidity and cost of treatment. **Case Report** A 39 year old male patient presented to OPD with abdominal pain since 15 days, low grade fever, anorexia and weight loss 1.5 months following TAPP repair of bilateral inguinal hernia 1.5 months ago. Work-up showed acute diverticulitis with diverticula perforation involving descending colon and adjacent sigmoid colon in left iliac fossa with collection in left iliac fossa. Lower Midline Exploratory laparotomy was performed. Around 100 cc pus was drained around mesh beneath parietal peritoneum, the infected mesh was removed. Post operatively patient recovered excellently. **Conclusion** TAPP is a safe procedure for treat groin hernias, unless, mesh complications like foreign body reaction, deep-seated infection, mesh migration and perforation into viscera can occur even 20 years later of the procedure with no defined incidence. The chance of recurrence of hernia following management of infected mesh should always be considered.

**KEYWORDS** : Inguinal hernia, TAPP (transabdominal pre-peritoneal) Repair, abscess

### INTRODUCTION

Over the past two decades laparoscopy has been established as a superior technique in many general surgery procedures. Accordingly laparoscopic mesh repair techniques have been tried and proven to be have advantages over open hernia procedure, such as less acute and chronic pain, early return to work with no difference in recurrence rate(1). TAPP (Trans-abdominal Pre-Peritoneal) and TEP (Totally Extraperitoneal) procedures are performed by almost every laparoscopic surgeons worldwide. It is now fast becoming a superior technique in the repair for inguinal hernia(2). The complication rates of abscess and wound infection Rate is significantly low in laparoscopic approach than in open approach with similar recurrence rate\*(3,4). Felix *et al* performed laparoscopic inguinal hernia surgery in around 1000 patients and found that the complication rate was 0.5%(5). Deep-seated mesh infection is rare but once it occurs it can be very difficult to treat and may cause chronic groin sepsis and abscess. The rate of mesh infection after open mesh repair is reported to be between 0.5% - 3%, whereas in laparoscopic repair is less than 0.16%(6-8). The patient may present with painful groin swelling, and sinus formation(9). Conservative treatment is usually not successful hence requiring removal of mesh and drainage of collection. The mesh removal can be done by open anterior approach or by laparoscopic approach(10). Here, we present a case of abscess formation with mesh infection following TAPP for left indirect inguinal hernia which required removal of the infected mesh with drainage of abscess by lower midline exploratory laparotomy approach.

### Case Report

A 39 years old male presented to outpatient department with complaint of swelling in left iliac fossa region more towards noticed for 1 month which was gradually increasing in size with lower abdominal pain since one month. Transabdominal pre-peritoneal (TAPP) mesh repair was done in Outside Hospital one and half months back a 10 x 15 centimeters polypropylene microporous mesh used and fixed with non-

absorbable titanium tacker at cooper's ligament, lateral rectus muscle and the third one at the lateral aspect. Early post-operative period was uneventful and he was discharged on second post-operative day. He was followed up one week after for skin suture removal where he had no complaints except for some pain at the surgical site while walking. 8-10 days after the surgery he presented in the outpatient department of that outside hospital with complaint of mild fever and diarrhoea for which oral medication was given. He also complained of decreased appetite and weight loss. He was admitted there for 3 days for injectables and symptoms relieved partially. Outside contrast-enhanced computed tomography revealed large loculated collection seen in left iliac fossa extending inferiorly into left to pelvis. Collection is seen in close proximity to descending colon in left iliac fossa. There is focal subserosal wall thickening involving descending colon and adjacent sigmoid colon. the collection inferiorly abuts left side of urinary bladder. It measures 55 x 52 x 80 mm (volume 100 cc). Diffuse surrounding inflammatory facial thickening seen, possibility of acute diverticulitis with perforation with large localized collection in left iliac fossa. No any growth, bowel obstruction or significant perilesional nodes. He was admitted and started on antibiotics then lower midline Exploratory laparotomy surgery was done.



Figure 01. Intra-operative finding : dissecting the sigmoid colon off the TAPP space

Distal sigmoid colon was adherent to previously operated site so adhesiolysis was done. Drainage of 100 ml of pus from Trans-abdominal Pre-peritoneal space and removal of the infected mesh was done. After thorough irrigation of the pre-peritoneal cavity, drain was placed and defect was closed using interrupted technique. Abdominal drain kept in pelvis. Post-operatively patient was kept on third generation cephalosporin and metronidazole. The patient improved and was discharged on the 6th post-operative day.

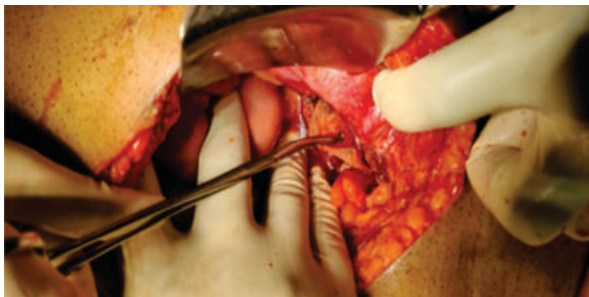


Figure 02. Removal of Infected Mesh from TAPP Space

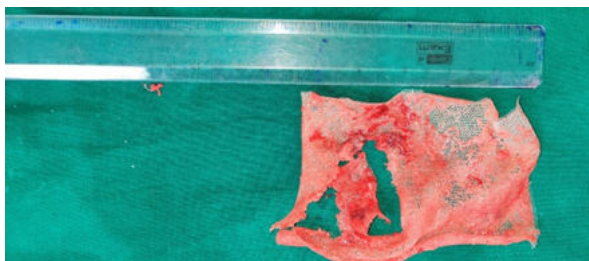


Figure 03. Removed Infected Mesh

## DISCUSSION

Early wound infection is related to intra-operative contamination, whereas late prosthetic infection may be associated with persistent fluid collection(11). Various factors have been instated for mesh infection that includes patient factors, technical factors and postoperative complications. Patient factors include chronic obstructive lung disease, high Body Mass Index, smoking, advance age, American Society of Anesthesiologist ASA >3(12,13). Technical factors include prior surgical site infections, prior surgery at the same site, iatrogenic enterotomy, microporous/multifilament/heavy weight/hydrophobic mesh, vicryl- prolene composite mesh, longer operating time, and lack of tissue coverage of mesh(12-15). Seroma formation following surgery is a potential risk factor for mesh infection and repeated aspiration of seroma is also regarded as one(10). The reported incidence of seroma formation after TAPP is 3.0-8.0%(16) and for TEP is 0.5-12.2%(17). The need for extensive dissection of pre-peritoneal space and placement of mesh as well as inflammatory response related to surgical applications, such as cutting, electrocautery all act for seroma formation(18). Hematoma, folded mesh can also lead to infection(18). In this patient we found that the pus collected was frank yellowish purulent with no evidence of hematoma. Most likely, the cause was seroma leading to infection and abscess formation.

In an article published by Cihan in 2006, the incidence of seroma formation after laparoscopic hernia surgery in 1<sup>st</sup> post-operative day increased from 56.7% to 66.7% after the use of ultrasonography post-operatively(18). Breakdown or spillage of the mesh, with concomitant loss of giant cells, could stimulate an acute inflammation, which is easily colonized by hematogenic bacteria(19).

In this case report we have described our experience of removal of infected mesh after laparoscopic hernia surgery from lower midline exploratory laparotomy approach. The laparoscopic TAPP approach for removal of infected mesh has

risk of spread/ spillage of pus in to the peritoneal cavity, adhesions. Apart from this there might be some difficulty in mesh identification due to presence of adhesion between bowel and peritoneum due to the initial surgery(8,20).Hernia recurrence after mesh removal is seen in 5% of cases according to 40 cases review done by S Rehman et al in 2012(21).

Taylor et al in 1999 reported two cases of recurrence of which one was asymptomatic. This occurred two years after the mesh removal and had to undergo open mesh repair. The patient further developed chronic groin sepsis and hence necessitated mesh removal(9). However Pradeep K et al reported the recurrence rate of 20%(10). In this case we repaired the defect with interrupted repair to prevent recurrence. Patient was discharged on 6th postoperative day. And was followed up on 14th day and then monthly where he had no complaints. He is planned for follow up at 1 year and 2 years.

Mesh infection with abscess formation is rare but dreadful complication following laparoscopic hernia repair. Appropriate sterilization or high-level disinfection is a must. Postoperative pain at the surgical site should not be taken lightly and possibility of complications such as seroma, hematoma superficial surgical site infections which may lead to deep seated mesh infection can always be ruled out using ultrasonography. Removal of the mesh with drainage of abscess can be carried out by either laparoscopic or open approach. The chance of recurrence of hernia following management of infected mesh should always be considered.

## REFERENCES

1. Bullen N, Massey L, Antoniou S, Smart N, Fortelny R. Open versus laparoscopic mesh repair of primary unilateral uncomplicated inguinal hernia: a systematic review with meta-analysis and trial sequential analysis. *Hernia*. 2019 Jun;3(23):461-72.
2. Group TH. International guidelines for groin hernia management. *Hernia*. 2018 Feb;22(1):1.
3. Salvilla SA, Thusu S, Panesar SS. Analysing the Benefits of laparoscopic hernia repair compared to open repair : a meta-analysis of observational studies. *Journal of minimal access surgery*. 2012 Oct-Dec;8(4):111.
4. Bhandarkar DS, Shankar M, Udwardia TE. Laparoscopic surgery for inguinal hernia: current status and controversies. *Journal of minimal access surgery*. 2006;2(3):178.
5. Felix E, Harbertson N, Vartanian S. Laparoscopic hernioplasty. *Surgical endoscopy*. 1999 Mar;13(4):328-31.
6. Birth M, Friedman R, Melullis M, Weiser H. Laparoscopic transabdominal preperitoneal hernioplasty: results of 1000 consecutive cases. *Journal of laparoscopic surgery*. 1996 Apr;6(5):293-300.
7. Litwin DE, Pham QN, Oleniuk FH, Kluffinger AM, Rossi L. Symposium on the management of inguinal hernias, 3: laparoscopic groin hernia surgery: the TAPP procedure [Transabdominal preperitoneal repair]. *Canadian Journal of Surgery*. 1997 Jun;40(3):192.
8. Tamme C, Scheidbach H, Hampe C, Schneider C, Kockerling F. Totally Extra-peritoneal endoscopic inguinal hernia repair (TEP). *Surgical Endoscopy and Other Interventional Techniques*. 2003 Feb;17(2):190-5.
9. Taylor S, O'dwyer P. Chronic groin sepsis following tension-free inguinal hernioplasty. *British journal of surgery*. 1999 Apr;86(4):562-5.
10. Chowbey PK, Khullar R, Sharma A, Soni V, Baijal M, Garg N, et al. Laparoscopic management of infected mesh after laparoscopic inguinal hernia repair. *Surgical Laparoscopy, Endoscopy & Percutaneous Techniques*. 2015 Apr;25(2):125-8.
11. Mann DV, Prout J, Havranek E, Gould S, Darzi A. Late-onset deep prosthetic infection following mesh repair of inguinal hernia. *The American journal of surgery*. 1998 Jul;176(1):12-4.
12. Sanchez VM, Abi-Haidar YE, Itani KM. Mesh infection in ventral incisional hernia repair: incidence, contributing factors, and treatment. *Surgical infections*. 2011 Aug;12(3):205-10.
13. Mavros MN, Athanasiou S, Alexiou VG, Mitsikostas PK, Peppas G, Falagas ME. Risk factors for mesh-related infections after hernia repair surgery: a meta-analysis of cohort studies. *World journal of surgery*. 2011 Sep;35(11):2389.
14. Harrell A, Novitsky Y, Kercher K, Foster M, Burns J, Kuwada T, et al. In vitro infectability of prosthetic mesh by methicillin-resistant *Staphylococcus aureus*. *Hernia*. 2006 Apr;10(2):120-4.
15. Halaweish I, Harth K, Broome A-M, Voskerician G, Jacobs MR, Rosen MJ. Novel in vitro model for assessing susceptibility of synthetic hernia repair meshes to *Staphylococcus aureus* infection using green fluorescent protein-labelled bacteria modern imaging techniques. *Surgical infections*. 2010 Oct;11(5):449-54.
16. Reddy V, Sutton C, Bloxham L, Garcea G, Ubhi S, Robertson G. Laparoscopic repair of direct inguinal hernia: a new technique that reduces the development of postoperative seroma. *Hernia*. 2007 Nov;11(5):393-6.
17. Berney C. The Endolop technique for the primary closure of direct inguinal

- hernia defect during the endoscopic totally extraperitoneal approach. *Hernia*. 2012 Jun;16(3):301-5.
18. Cihan A, Ozdemir H, Ucan B, Acun Z, Comert M, Tascilar O, et al. Fate or fate. Seroma in laparoscopic inguinal hernia repair. *Surgical endoscopy*. 2006 Feb;20(2):325-8.
  19. Foschi D, Corsi F, Cellerino P, Trabucchi A, Trabucchi E. Late rejection of the mesh after laparoscopic hernia repair. *Surgical endoscopy*. 1998 Apr;12(5):455-7.
  20. Chihara N, Mishima K, Suzuki H, Watanabe M, Toyoda T, Uchida E. Totally extraperitoneal (TEP) removal of an infected mesh by laparoscopy after open preperitoneal repair: initial case report. *Journal of Nippon Medical School*. 2017 Jan;84(1):45-8.
  21. Rehman S, Khan S, Pervaiz A, Perry E. Recurrence of inguinal herniae following removal of infected prosthetic meshes: a review of the literature. *Hernia*. 2012 Apr;16(2):123-6.