Colocutaneous fistula after mesh plug inguinal hernia repair—a delayed complication

Ahmad Zubaidi,* Mohammed Al Saghier,† Monther Kabbani,† Ayman Abdo*

Hernia repair is among the oldest and the most common operation in a surgeon's technical armamentarium. Unfortunately, it is widely acknowledged that primary inguinal hernia repair will result in a 10% to 15% recurrence rate with an even higher percentage following the repair of a recurrent inguinal hernia. Numerous surgical techniques to repair inguinal hernia have been described in the literature. This includes an important advancement in the reduction of tissue tension, which was the pioneering work of Usher and associates who first reported the use of *Marlex* (monofilament knitted polypropylene) mesh in the repair of inguinal and incisional hernias in 1958. These surgeons utilized the mesh prosthesis to buttress and reinforce a previously sutured repair.

The term "tension free" hernioplasty was first used in the literature by Liechtenstein and colleagues in 1986. The authors described a surgical technique that consisted of a suture on lay mesh patch as the primary repair.¹ This series consisted of 1000 consecutive patients followed for as long as 5 years without significant recurrence and with rapid return to full activities. The significance of this report is that the mesh prosthesis is not utilized to buttress or support a primary sutured herniorrhaphy but is the actual repair.¹ Gilbert was the first to describe the sutureless repair of inguinal hernia.²

Rutkow presented a follow-up of 2403 patients from 1989 to 1994 for almost 6 years of tension free mesh plug herniorrhaphy with less than 1% recurrence rate of the primary and 2% recurrent herniorrhaphy.³ This procedure was associated with a minimum of postoperative complications such as urinary retention, infection involving the mesh, ischemic orchitis, vascular and embolic, long-term pain and a draining sinus tract.⁴ However, though several complications have been related to the tissue tension free technique, rare complications that are secondary to the mesh migration have been reported.

Case

A 75-year-old man was admitted as a day surgery patient to the plastic surgery service to have a split thickness skin grafting of a chronic vasculitic ulcer on the right lower leg. He had been on 40 mg prednisone for his vasculitis. Three years prior to this presentation he had a left inguinal hernia mesh plug repair. On the first postoperative day, the patient complained of a painful lump in his left groin, which was found on physical examination. The decision was made to go ahead with exploring the left groin for possible repair of the recurrent left inguinal hernia (LIH). Intraoperatively, a lot of fibrosis was seen within the subcutaneous mesh and a small amount of grossly purulent fluid was found between the skin. The mesh was not removed, the wound was left open and packed gently. The patient was put on ampicillin and gentamicin therapy postoperatively. The wound culture showed coagulase negative

*From the *Department of Medicine, King Khalid University Hospital, and †Liver Transplant Department, King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia*

Correspondence and reprint requests:

*Mohammed Al Saghier, MD
Liver Transplant Dept
MBC 72*

*King Faisal Specialist Hospital & Research Center
P.O. Box 3354
Riyadh 11211
Saudi Arabia*

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staphylococcus.

Post-operatively the patient was discharged on the appropriate antibiotics but the wound continued to discharge for two weeks. The diagnosis of enterocutaneous fistula was considered and a fistulogram was ordered, which was initially inconclusive. The wound continued to drain a purulent discharge with gas coming from the wound. Another fistulogram was performed which, this time, showed a fistula between the skin and the sigmoid colon. We thought that the origin of the fistula might have been diverticulitis. The patient was scheduled for laparotomy and anterior resection, removal of the mesh plug, and hernia repair from inside. Intraoperatively, the mesh was found to be attached to the sigmoid colon (Figure 1), which showed a lot of diverticular disease.

Figure 1. Mesh attached to the sigmoid colon.

Discussion

There are several reported complications associated with hernia repair. The commonest are chronic groin pain, followed by neurologic, cardiac and testicular complications. There are also reported complications related to prosthetics such as infection, contraction and rejection. To our knowledge, this is the first reported case of sigmoid colocutaneous fistula due to sutureless polypropylene mesh placed with or by transcutaneous technique with intact (not opened) peritoneum.

There are numerous synthetic meshes in current use, but the polypropylene mesh is the most widely used artificial prosthesis. The inflammatory reactions of polytetrafluoroethylene (*Gortex*) and sub-

cutaneously implanted *Marlex* mesh were compared by Stokeld et al⁵ who found that the *Marlex* mesh was associated with a significantly greater chronic inflammatory reaction and fibrosis than the *Gortex* mesh. All direct and indirect hernia repairs require that the plug be secured in position by placing sutures through the mesh and the crura of the internal ring or the edges of the direct defect. This case proves that successful plug repair is strictly related to the stability of the positioned hernia plug after repair immediately post-op until the tissue reaction occurs.

The tissue reaction to *Marlex* mesh was studied in three different layers of the abdominal wall in rats by Dabroniecki et al.^{5,6} The reaction to the mesh was compared in terms of blood flow, tissue edema and histological appearance. The investigators found that the mesh implant placed in apposition to the muscle developed better flow, which is important for proper healing and integration. The inflammatory reaction was similar in the peritoneum and muscle, and least pronounced in the subcutaneous tissue. This tissue response is variable from person to person. The response could be so intense that prosthetic material can be complicated by formation of contraction. Intestinal obstruction or fistula formation is possible by erosion and migration, especially with the presence of physical contact between graft and the bowel.⁷

In our patient, it seems that there was not enough tissue reaction, which led to migration of the mesh to the intraperitoneum and erosion into the sigmoid colon. Possible factors that may have contributed to fistula formation in this patient include: 1) vasculitis, which led to a decreased blood supply to the area and increased the risk of inflammation; 2) the presence of a diseased sigmoid colon and close contact of the mesh to the peritoneum, and subsequently to the diseased colon; 3) steroid use in this patient may be blamed for the delayed tissue reaction.

In conclusion, a colocutaneous fistula needs to be considered in the differential diagnosis in patients who are taking steroids and present with a lump at the site of a previous inguinal hernia repair with polypropylene mesh. Classic tissue repair might be ideal for the patient with high medical risk factors since the risk of migration of a mesh plug is higher in such patients.

References

1. Lichtenstein IL. The tension free hernioplasty. *A J Surgery* 1989; (157): 188-193.
 2. Gilbert AI. Sutureless repair of inguinal hernia. *A J Surgery* 1992; (163): 331-335.
 3. Rutkow IM. Tension free inguinal herniorrhaphy: A preliminary report on mesh plug technique. *Surgery* 1993; 114: 3-8.
 4. Rutkow IM. Mesh plug hernia repair: A followup report. *Surgery* 1995; 597-598.
 5. Klosterhalfen S. Functional and morphological evaluation of different polypropylene mesh modification for abdominal repair. *Biomaterial* 1998; 19: 2235-2246.
 6. Berry SM. Classification and pathophysiology of enterocutaneous fistula. *Surg Clin of North America* 1996; 76(5): 772-773.
 7. Gray MR, Curtis JM, Elkington JS. Colovesical fistula after laparoscopic inguinal hernia repair. *Br J Surg* 1994; 81: 1213-1214.
 8. Miller K, Junger W. Ileocutaneous fistula formation following laparoscopic polypropylene mesh hernia repair. *Surg Endosc* 1997; 11: 772-773.
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