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A case of a colocutaneous fistula: A rare complication of mesh migration into the sigmoid colon after open tension-free hernia repair

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ABSTRACT

INTRODUCTION: The Lichtenstein technique is commonly used in inguinal hernia repair and a polypropylene mesh is the most frequently used mesh. Mesh migration into the colon has been rarely reported in the literature. Here we report a case of a colocutaneous fistula that developed following delayed mesh migration into the sigmoid colon.

PRESENTATION OF CASE: A 52-year-old man undergone Lichtenstein repair for left direct inguinal herniain 2008. Three years later, he presented complaining of rectal bleeding and concurrent bloody discharge from the hernia repair scar. Colonoscopy identified an internal fistulous orifice with intraluminal extrusion of the polypropylene mesh. Furthermore, abdominal ultrasound revealed a fistulous tract extending from the sigmoid colon to the anterior abdominal wall, and a fistulogram confirmed the findings. Open sigmoidectomy and resection of the abdominal wall with the fistula tract was performed, and BIO-A® tissue reinforcement meshwas placed. His postoperative course was unremarkable and was discharged on postoperative day 3.

DISCUSSION: Mesh migration after mesh inguinal hernia repair is unpredictable. A previous report has presented complications related to prosthetics in hernia repair, such as infection, contraction, rejection, and, rarely, mesh migration.Mesh migration may occur as an early or late complication after hernioplasty.

CONCLUSION: During hernia repair, the surgeon should carefully check for a sliding hernia, which may contain the sigmoid colon within the sac, because failure to identify this hernia may lead to direct contact between the mesh and the colon, which may cause pressure necrosis and fistula formation followed by mesh migration.

1. Introduction

Inguinal hernia repair is a widely performed surgical procedure [1], and several techniques for inguinal hernia repair have been described in the literature. One such technique involves the use of a mesh. The use of a tension-free mesh has been best described by Lichtenstein [2]. The Lichtenstein technique for inguinal hernia repair has been shown to have good outcomes, and hence, it is currently being used worldwide [2]. A previous study has reported that approximately 20 million prosthetic meshes are used worldwide in surgical practice [3].

A polypropylene mesh is considered to be ideal in the Lichtenstein technique, and it is the most frequently used mesh for inguinal hernia repair because of its advantages over other types of meshes [2]. A polypropylene mesh has been shown to be associated with low hernia recurrence rates (<2%), less postoperative pain, and fast recovery [2]. Complications may sometimes occur with the use of a mesh in inguinal hernia repair. In a review of 1834 patients who underwent mesh inguinal hernia repair, Akyol et al. [4] reported an infection rate of 0.8%. However, in a similar review on patch inguinal hernia repair, Lichtenstein reported an infection rate of 0.003% [4]. Different incidences of chronic infection after mesh inguinal hernia repair have been reported in the literature, and this inconsistency has been shown to occur because of differences in the type of mesh used, the surgeon's technical ability, and the use of prophylactic antibiotics [4].

Chronic infections can result in serious complications such as sinus tract formation, abscess, visceral adhesions, and fistulas. Additionally, mesh migration followed by fistula formation is a rare and serious complication that may occur after mesh inguinal hernia repair [4]. These complications may occur after both open tension-free hernia repair and laparoscopic hernia repair. A colocutaneous fistula is a very rare complication and may develop over a period of 20 years after inguinal hernia repair [5]. Here we report a case

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Fig. 1. Image showing cellulitis and granulation tissue.

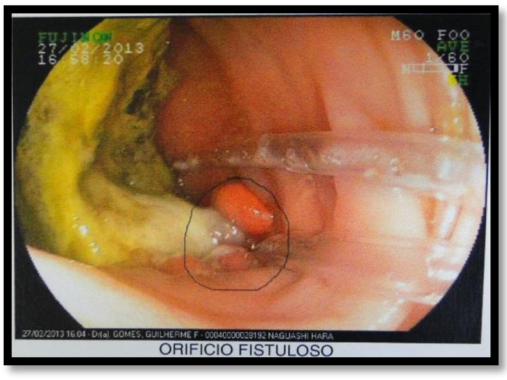

Fig. 2. Colonoscopy showing an internal orifice in the sigmoid colon.

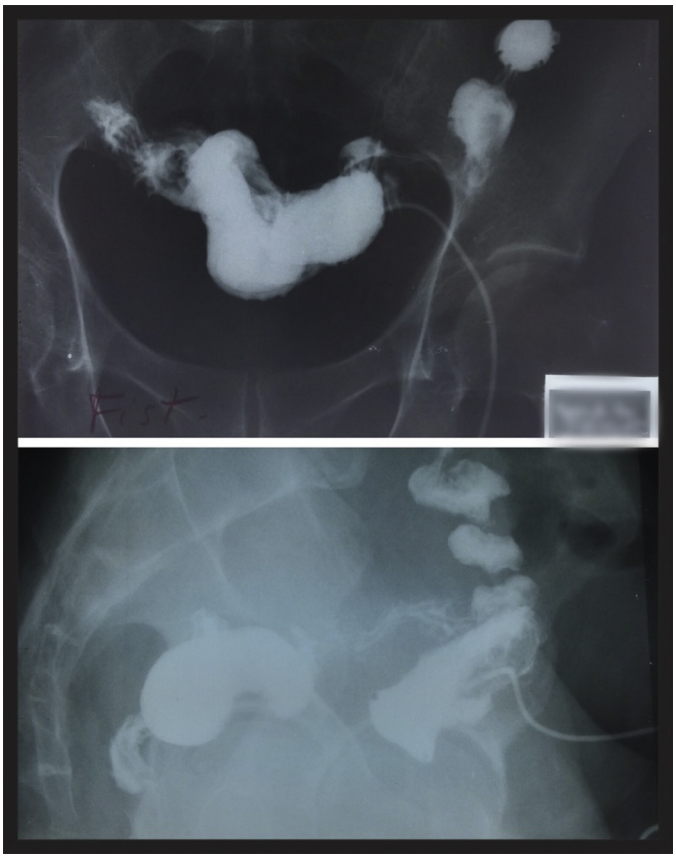

Fig. 3. Antero-posterior (top) and lateral (below) views of the fistulogram showing the colocutaneous fistula.

of a colocutaneous fistula that developed following delayed mesh migration into the sigmoid colon.

2. Presentation of case

The patient was a 52-year-old man who worked as a laborer. He had been previously diagnosed with hypertension, type II diabetes mellitus, and obesity (body mass index, 39 kg/m^2). He had undergone tension-free Liechtenstein hernia repair for left direct inguinal hernia at a different clinic in 2008. A polypropylene mesh (size, 13 × 8 cm) was used, and he was discharged on postoperative day 1. He was believed to have had an uneventful postoperative follow-up at 6 months following discharge. Three years after the procedure (2011), he presented to our clinic complaining of wound site pain associated with turbid discharge. No history of fever or local trauma was noted, and an examination revealed cellulitis around the wound site with a discharging sinus (Fig. 1).

He was diagnosed with local abscess and superimposed skin cellulitis. He was admitted for incision and drainage and administered broad-spectrum antibiotics, and the antibiotics were later changed according to the swab culture results. He refused medical treatment and left the clinic against medical advice. Two years later (2013), he presented to our clinic with a 3-days history of rectal bleeding and concurrent bloody discharge from the hernia repair scar. He was clinically stable, and the findings of a physical examination and laboratory investigations were unremarkable.

Colonoscopy identified an internal fistulous orifice with intraluminal extrusion of the polypropylene mesh at 35 cm from the anal verge (Fig. 2).

Furthermore, abdominal ultrasonography revealed a fistulous tract extending from the sigmoid colon to the anterior abdominal wall, and a fistulogram confirmed the presence of a colocutaneous fistula (Fig. 3).

Fig. 4. The sigmoid colon eroded by the mesh.

Open sigmoidectomy and resection of the abdominal wall with the fistula tract was performed, and a GORE® BIO-A® tissue reinforcement mesh was placed. He had an unremarkable postoperative course and was discharged on postoperative day 3. He was followed up at our outpatient clinic 2 weeks postoperatively, and no problems were noted. His condition was good, and he was able to perform all daily activities.

The resected sigmoid colon eroded by the mesh is shown in Fig. 4, and the mesh is shown in Fig. 5.

Fig. 5. The mesh.

3. Discussion

We reported a case of a colocutaneous fistula that developed following delayed mesh migration into the sigmoid colon. Mesh migration after mesh inguinal hernia repair is unpredictable. A previous report has presented complications related to prosthetics in hernia repair, such as infection, contraction, rejection, and, rarely, mesh migration [6]. Mesh migration may occur as an early or late complication after hernioplasty [5]. Additionally, mesh migration into the urinary bladder is the most commonly reported mesh migration in the literature [7]. However, hollow viscous migration is considered rare after hernia repair [6]. Common sequelae of mesh migration into the intestine include variable abdominal pain, intra-abdominal abscess, intestinal obstruction or perforation, fistula, and hematochezia [8], and some of these symptoms are similar to those of diverticulitis [9]. Three cases of colocutaneous fistulas with varied manifestations after Liechtenstein hernia repair have been reported. One case involved a mesh plug, while the other cases occurred after incisional hernia repair. Additionally, few cases of colocutaneous fistulas have been reported after laparoscopic repair. However, mesh migration into the large intestine is uncommon, and if suspected, it is best detected with colonoscopy [8,9,10].

Klosterhalfen et al. [11] compared inflammatory reactions between polytetrafluoroethylene (Gortex) and subcutaneously implanted polypropylene (Marlex) meshes, and found that the occurrences of chronic inflammatory reactions and fibrosis were greater with the Marlex mesh than with the Gortex mesh [11]. Erosion and migration due to contact between the mesh and the bowel is considered to possibly result in intestinal obstruction or fistula formation [12,13].

4. Conclusion

Although no evidence is present to support a link between infection and treatment procedures [14], the surgical technique or type of mesh used in hernia repair may influence the rate of infection, and further studies are needed to confirm this influence [13].

In the present case, we used a GORE® BIO-A® tissue reinforcement mesh for the reconstruction of the anterior abdominal wall. The BIO-A® tissue reinforcement mesh encourages the formation of vascularized tissue, which greatly helps the formation of neotissue. Furthermore, this mesh can be safely used in a contaminated area, if required [15].

In the present case, there was limited information on the cause of the complication as information on the initial repair was lacking and the repair was performed by a surgeon in a different clinic. We presumed that the pressure necrosis resulted from physical contact between the mesh and the colon, which led to fistula formation and consequently to mesh migration into the colon. During hernia repair, the surgeon should carefully check for a sliding hernia, which may contain the sigmoid colon within the sac, especially in elderly patients, because failure to identify this hernia may lead to direct contact between the mesh and the colon, which may cause pressure necrosis and fistula formation followed by mesh migration. Here, we presented a case of a colocutaneous fistula that developed following delayed mesh migration into the sigmoid colon.

Conflict of interests

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Consent

Obtained from the patient for publication.

Ethical approval

Ethical approval and informed consent was obtained and available upon request.

Author's contribution

Dr. Saud Al-Subaie: writing the paper, drafting the article and revising it critically for important intellectual content.

Dr. Mohanned Al-Haddad: study concept or design and data collection; writing the paper.

Dr. Wadha Al-Yaqout: writing the paper and drafting the article.

Mufarrej Al-Hajeri: collecting data and writing the paper.

Christiano Claus: operating surgeon and design the study.

Guarantor

Dr. Saud Al-Subaie.

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