

## Unusual Timing of Mesh Migration Following Inguinal Hernioplasty: A Case Report and Literature Review

İnguinal Herni Onarımı Sonrası Alışılmadık Zamanda Mesh Migrasyonu: Olgu Sunumu ve Literatür Gözden Geçirme

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### ABSTRACT

Mesh migration to the bladder after inguinal hernioplasty is a rare but important complication. We report a rare case of mesh migration to the bladder three weeks after inguinal hernioplasty. We also present a literature review involving cases of mesh migration following hernioplasty.

**Key Words:** Mesh migration, inguinal hernioplasty, bladder

**Received:** 12.12.2016

**Accepted:** 01.20.2017

### ÖZET

İnguinal hernioplasti sonrası mesaneye mesh migrasyonu az görülen fakat önemli bir komplikasyondur. Biz bu yazıda, inguinal herni onarımından 3 hafta sonra gelişen mesaneye mesh migrasyonu vakasını raporladık. Ayrıca, literatürdeki inguinal hernioplasti sonrası mesaneye mesh migrasyonu gelişen vakaları da gözden geçirdik.

**Anahtar Sözcükler:** Mesh migrasyonu, inguinal hernioplasti, mesane

**Geliş Tarihi:** 12.12.2016

**Kabul Tarihi:** 20.01.2017

### INTRODUCTION

Postoperative recurrence rates for inguinal hernioplasty have been significantly reduced since the synthetic mesh has been widely used (1). However, complications, such as seroma and hematoma (2), persistent groin pain (3), superficial wounds (4) and deep wound/mesh infection (5), and mesh migration (6-28) have been reported in the literature. Mesh migration is rarely seen during the late postoperative period, but when it occurs it can be seen in the bladder, the bowel, and the peritoneum (6-28). The treatment of mesh migration includes exploration of the affected organ and excision of the fistula tract with mesh. This article reports on a case of mesh migration to the bladder three weeks after inguinal hernioplasty.

### CASE REPORT

A 73-year-old male patient with a diagnosis of right obstructed inguinal hernia with ileus was admitted to the emergency service. Abdominal exploration from the infraumbilical midline incision and right inguinal hernioplasty was conducted and a polypropylene (Prolene®) mesh was inserted preperitoneally from the right suprainguinal incision. A coronary stent was placed after coronary angiography due to angina pectoris in the postoperative period, and the patient underwent antiplatelet therapy. The patient was admitted to our clinic due to irritative lower urinary tract symptoms, including burning and difficulty during urination 15 days after being discharged from the hospital. There was no previous history of urological surgery.

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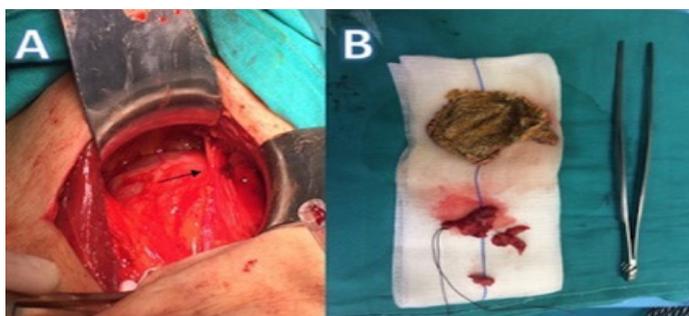
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doi:<http://dx.doi.org/10.12996/gmj.2017.46>

The incision site was clean, the physical examination was normal, and there was no evidence of fever and/or systemic infection. On urinalysis, many leukocytes and positive nitrites were seen in the patient's urine, but erythrocytes were not detected. Bacterial growth was not found in the urine culture. The solid hyperechoic view in the bladder wall was observed on abdominal ultrasonography (USG), which was performed because the patient did not have a clinic response to the antibiotic treatment. Subsequently, abdominal/pelvic computerized tomography (CT) revealed some calcification and hemorrhage in the bladder lumen. Uncertain limited soft tissue structures and fistula from the bladder to the peritoneum were found (Fig. 1). Cystoscopy was performed and mesh with mucosal erosions was seen on the superior side of the right wall of the bladder. A decision was made to conduct a pelvic exploration via Pfannenstiel incision, and mesh, extending from the right inguinal region to the bladder, was seen (Fig. 2A). The bladder was opened at the dome. The mesh was extracted. The necrotic bladder wall and the fistula tract were excised (Fig. 2B). The bladder defect was repaired using the double-layer suture technique. A Jackson-Pratt drain was placed infrapubically. The drain was removed in three days. The urethral catheter was removed on the postoperative 10th day.



**Figure 1.** Abdominal/pelvic CT revealed some calcification and hemorrhage in the bladder lumen. Uncertain limited soft tissue structures and fistula from the bladder to the peritoneum were found.



**Figure 2.** (A) Mesh, extending from the right inguinal region to the bladder, was seen during pelvic exploration (arrow). (B) Extracted mesh with excised necrotic bladder wall and fistula tract.

## DISCUSSION

Mesh migration to the bladder after inguinal hernioplasty is a rare but important complication. In the literature, there are no randomized controlled studies on mesh migration or erosion after hernioplasty. A small number of case reports have been published (6-28).

The pathophysiology of mesh migration after hernioplasty is still unclear. It was hypothesized that the migration with erosion of tissue is triggered by the inflammation around the mesh (18). Some authors have suggested that indolent infection, which can be caused by staphylococcus growth, as seen on the bacterial biofilms, occurs on the mesh (15). Agrawal et al. (7) assessed mesh migration as a two-level system with primary and secondary types. The primary type was identified as mechanical displacement of the mesh to the area where tissue resistance is lower due to improper fixation or external forces. The secondary type has been identified as tissue inflammation due to a foreign body reaction that could lead to the erosion of the surrounding tissues. Some authors mentioned that predisposing factors could include sharp edges of the mesh (11, 24); no fixation with sutures or staples (14) or improper fixation (7, 24) of the mesh; a history of urological surgery; and an intraoperative non-drained or overfilled bladder and the use of a laparoscopic transabdominal preperitoneal approach (TAPP) (18).

In the TAPP approach, direct contact between the mesh and the intraabdominal organs, due to a peritoneal defect on the inguinal floor, may result in adhesions and fistula formation (6). It is believed that a perioperatively non-drained bladder could cause complications as an unnoticed bladder injury or a mesh fixation to the bladder, especially in laparoscopic surgery; this increases the risk of mesh contact with the bladder, postoperatively (10, 20).

The clinical presentation of mesh migration to the bladder after hernioplasty may vary according to the degree of migration and the organs that are involved. The conditions most frequently experienced by patients presenting with this type of mesh migration include hematuria (10, 13, 14, 16, 17, 19, 21, 24) and recurrent/persistent urinary tract infection (6-8, 12, 15, 21, 23). Hematuria may be painless, or it may also be present with irritative symptoms. Fever (11), inguinal pain (6, 18), discharge from the groin (8, 11), pneumaturia (12), and dysuria (9, 10, 20) have all been reported in the literature. Mesh erosion was observed incidentally on an asymptomatic patient during an endoscopic examination (22).

In patients who have a suspicion of mesh migration, radiographic examination begins with a pelvic X-ray. Depending on the clinical suspicion, additional tests may be ordered including intravenous urography (IVU), USG, CT, and magnetic resonance imaging (MRI). The appearance of a mass in the bladder (11, 17-19, 23, 24) and bladder stones (7, 8, 14, 15, 21) were most often reported in the literature. In addition, calcification of the bladder wall (20, 22), liquid in the Retzius space (16), and bladder wall thickening (6, 10, 13) were other identified radiological findings. Wall thickening in the bladder, calcifications, bladder stones and a tumor in the bladder or pelvis can be detected using USG. When a bladder tumor or a pelvic tumor is suspected, deep abscess, peritonitis, intestinal obstruction, fistula, and, for cases that are suggestive of migration, CT and MRI examination, play an important role; this affects the type of surgery that the patient will undergo. However, in the presence of a suspected malignancy, it is not possible to differentiate the tumor using CT; instead, a cystoscopic examination and biopsy are required.

The treatment approach varies according to the degree of the migration. This can be as easy as removing the mesh that can be seen with the cystoscopy, or as difficult as requiring a bowel resection. Agrawal et al. (7) saw mesh during cystoscopy and removed it transurethrally. However, the part of the mesh that is outside of the bladder may be related to genitourinary and the gastrointestinal tract. It should be noted that this kind of approach may cause iatrogenic injuries; therefore, radiological assessment should be performed prior to using that type of technique. For most cases, dense fibrous tissue around the mesh does not allow endoscopic excision; thus, the mesh must be removed along with the fibrotic tissue around the bladder (8, 10, 11, 13-21, 23, 24). In complicated cases, the structures and adjacent organs might require a more specific approach. Using a holmium laser endoscopically, Nikhil et al. (22) cut out the part of the mesh that protruded into the bladder lumen, and followed the patient as asymptomatic with cystoscopy.

The latent period between clinical presentation of mesh migration and hernioplasty varies from a few weeks to 13 years. In our case, the latent period was three weeks; that time period was the shortest reported in the literature. Chand et al. (10) reported mesh migration developing a few weeks after laparoscopic incisional hernioplasty, but they did not catheterized the bladder perioperatively, and, postoperatively, the patient developed acute urinary retention. On exploration, the mesh migration was seen moving from the superior portion of the bladder, intraoperatively, to the dome of bladder, which resulting in the need for the mesh excision; they observed the bladder returning to the anatomic location after the mesh was released. The authors thought that these findings might be related to acute urinary retention, which developed postoperatively, and not to the catheterized bladder, which occurred intraoperatively. We think the factors that can lead to complications, such as mesh fixation to the bladder and unnoticed bladder injuries due to changing the location of the bladder, which also happened in our case and which have a short latent period, are primary causes for mess migration.

**CONCLUSION**

Although it is rarely reported, mesh migration should be considered in cases with unexplained urinary symptoms in which patients have a history of hernioplasty with suspicious imaging of the urinary tract. Before surgery, a detailed radiological evaluation should be performed in order to detect any accompanying comorbid conditions. The type, shape, placement, and fixation of the mesh, and perioperative bladder drainage are very important factors to consider when trying to avoid complications that could lead to mesh migration after hernioplasty.

**Conflict of interest**

No conflict of interest was declared by the authors.

**REFERENCES**

1. Flum DR, Horvath K, Koepsell T. Have outcomes of incisional hernia repair improved with time? A population-based analysis. *Ann Surg.* 2003;237:129-35.
2. Hawn MT, Itani KM, Giobbie-Hurder A, McCarthy M, Jr., Jonasson O, Neumayer LA. Patient-reported outcomes after inguinal herniorrhaphy. *Surgery.* 2006;140:198-205.
3. Inaba T, Okinaga K, Fukushima R, Ikeda Y, Yamazaki E, Koide T, et al. Chronic pain and discomfort after inguinal hernia repair. *Surg Today.* 2012;42:825-9.
4. Sanabria A, Dominguez LC, Valdivieso E, Gomez G. Prophylactic antibiotics for mesh inguinal hernioplasty: a meta-analysis. *Ann Surg.* 2007;245:392-6.
5. Deysine M. Pathophysiology, prevention, and management of prosthetic infections in hernia surgery. *Surg Clin North Am.* 1998;78:1105-15.
6. Aggarwal S, Praneeth K, Rathore Y, Waran V, Singh P. Laparoscopic management of mesh erosion into small bowel and urinary bladder following total extra-peritoneal repair of inguinal hernia. *J Minim Access Surg.* 2016;12:79-82.
7. Agrawal A, Avill R. Mesh migration following repair of inguinal hernia: a case report and review of literature. *Hernia.* 2006;10:79-82.
8. Bjurlin MA, Berger AD. Herniorrhaphy mesh as nidus for bladder calculi. *Urology.* 2011;78:329-30.
9. Bodenbach M, Bschiepfer T, Stoschek M, Beckert R, Sparwasser C. [Intravesical migration of a polypropylene mesh implant 3 years after laparoscopic transperitoneal hernioplasty]. *Urologe A.* 2002;41:366-8.
10. Chand M, On J, Bevan K, Mostafid H, Venkatsubramaniam AK. Mesh erosion following laparoscopic incisional hernia repair. *Hernia.* 2012;16:223-6.
11. Chowbey PK, Bagchi N, Goel A, Sharma A, Khullar R, Soni V, et al. Mesh migration into the bladder after TEP repair: a rare case report. *Surg Laparosc Endosc Percutan Tech.* 2006;16:52-3.
12. Gray MR, Curtis JM, Elkington JS. Colovesical fistula after laparoscopic inguinal hernia repair. *Br J Surg.* 1994;81:1213-4.
13. Hamouda A, Kennedy J, Grant N, Nigam A, Karanjia N. Mesh erosion into the urinary bladder following laparoscopic inguinal hernia repair; is this the tip of the iceberg? *Hernia.* 2010;14:317-9.
14. Hume RH, Bour J. Mesh migration following laparoscopic inguinal hernia repair. *J Laparoendosc Surg.* 1996;6:333-5.
15. Jensen JB, Jonler M, Lund L. Recurrent urinary tract infection due to hernia mesh erosion into the bladder. *Scand J Urol Nephrol.* 2004;38:438-9.
16. Kocot A, Gerharz EW, Riedmiller H. Urological complications of laparoscopic inguinal hernia repair: a case series. *Hernia.* 2011;15:583-6.
17. Kurukahvecioglu O, Ege B, Yazicioglu O, Tezel E, Ersoy E. Polytetrafluoroethylene prosthesis migration into the bladder after laparoscopic hernia repair: a case report. *Surg Laparosc Endosc Percutan Tech.* 2007;17:474-6.
18. Lauwers P, Bracke B, Hubens G, Vaneerdegew W. Unusual complications of preperitoneal mesh implantation in the treatment of inguinal hernia. *Acta Chir Belg.* 2003;103:513-6.
19. Li WB, Chen XL, Zhan HL, Yang F, Liu BL, Zhou XF. Hernia mesh migration into bladder presenting as malignancy: potential source of diagnostic errors. *Hernia.* 2014;18:903-6.
20. Lopes RI, Dias AR, Lopes SI, Cordeiro MD, Barbosa CM, Lopes RN. A calcified foreign body in the bladder after laparoscopic inguinal hernia repair. *Hernia.* 2008;12:91-3.
21. Ngo T. Surgical mesh used for an inguinal herniorrhaphy acting as a nidus for a bladder calculus. *Int J Urol.* 2006;13:1249-50.
22. Nikhil K, Rishi N, Rajeev S. Bladder erosion and stone as rare late complication of laparoscopic hernia meshplasty: is endoscopic management an option? *Indian J Surg.* 2013;75:232-4.
23. Novaretti JP, Silva RD, Cotrim CA, Souto LR. Migration mesh mimicking bladder malignancy after open inguinal hernia repair. *Hernia.* 2012;16:467-70.
24. Riaz AA, Ismail M, Barsam A, Bunce CJ. Mesh erosion into the bladder: a late complication of incisional hernia repair. A case report and review of the literature. *Hernia.* 2004;8:158-9.
25. Rieger N, Brundell S. Colovesical fistula secondary to laparoscopic transabdominal preperitoneal polypropylene (TAPP) mesh hernioplasty. *Surg Endosc.* 2002;16:218-9.
26. Savioz D, Ludwig C, Leissing C, Bolle JF, Buhler L, Morel P. Repeated macroscopic haematuria caused by intravesical migration of a preperitoneal prosthesis. *Eur J Surg.* 1997;163:631-2.
27. Szitkar B, Yzet T, Auquier M, Robert B, Lafaye-Boucher N, Verhaeghe P, et al. [Late complications from abdominal wall surgery: report of three cases of mesh migration into hollow viscus]. *J Radiol.* 2010;91(1 Pt 1):59-64.
28. Thyssen JP, Thind PO, Stimpel HR. [Recurring urinary tract infection following an unexpected foreign body in the bladder]. *Ugeskr Laeger.* 2003;165:3833.