



# Spontaneous Migration of Intraoperative Mesh into Rectum following Ventral Hernia Repair

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## Abstract

### Keywords

- ▶ mesh migration
- ▶ hernia repair
- ▶ foreign body
- ▶ ventral hernia
- ▶ computed tomography

We present a rare case of spontaneous migration of mesh into the anal canal 6 years after laparoscopic intraoperative mesh placement for ventral hernia. Mesh migration is an uncommon phenomenon with an unclear etiology and is probably attributed to prolonged subclinical infection or foreign body reaction. This is probably the first case in literature to our knowledge, where composite mesh was migrated into the anal canal after a laparoscopic intraoperative mesh placement and was retrieved in a natural way without surgical intervention.

## Introduction

Mesh migration is an unusual complication of hernia repair and is defined as mesh that resulted in the invasion of any anatomical region other than the area intended for the repair. It occurs years after surgery. Mesh migration can be primary due to inadequate securing which happens in the same plane or secondary that is transanatomical and usually due to inflammation or infection. Migration of mesh into the bowel can cause complications such as obstruction, infection, or fistula formation. This report discusses a rare occurrence of spontaneous migration of the ventral hernia repair mesh into the bowel lumen (jejunum to rectum) which was retrieved without surgical procedure.

## Case Report

A 68-year-old female presented to the emergency department with abdominal pain, vomiting, and distension. Significant history included paraumbilical hernia repair 5 years

back by laparoscopic intraoperative mesh placement using a composite mesh (containing polyester and polyurethane). There was an episode of mesh infection postsurgery which was managed conservatively.

Clinically, small bowel obstruction was suspected and hence a contrast-enhanced computed tomography (CT) was done to evaluate the cause for obstruction which revealed recurrent obstructed paraumbilical ventral hernia. The patient was taken up for open repair. Intraoperatively, recurrent hernia containing small bowel was confirmed and a mass of crumpled mesh (used in previous surgery) was noted at the repaired site. The mesh area was fibrosed, adherent, and could not be removed. An open subcutaneous onlay mesh repair was then done using a polypropylene mesh.

The immediate postoperative period was unremarkable. The patient presented again with two to three episodes of small bowel obstruction after 1 year for which she underwent a plain CT. The scan revealed dilated jejunal loops and an intraluminal hyperdensity which was overlooked as fecal

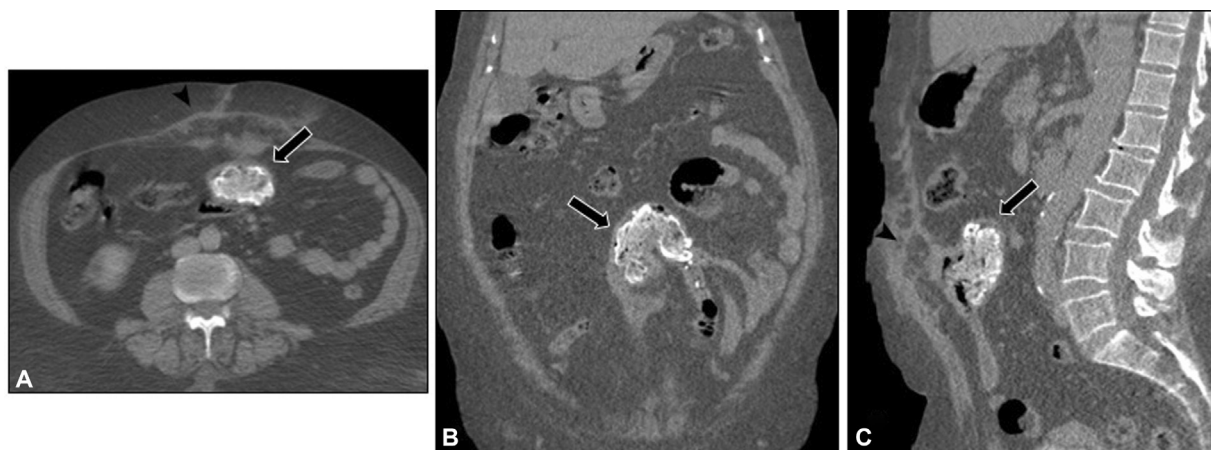
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**Fig. 1** Plain computed tomography axial (A), coronal (B), and sagittal (C) sections at the time of admission with first episode of bowel obstruction show a convoluted hyperdense intraluminal foreign body within the proximal jejunum (black arrow). Mild adjacent inflammatory changes seen. Changes in the abdominal wall reflect previous hernia repair (arrow head).

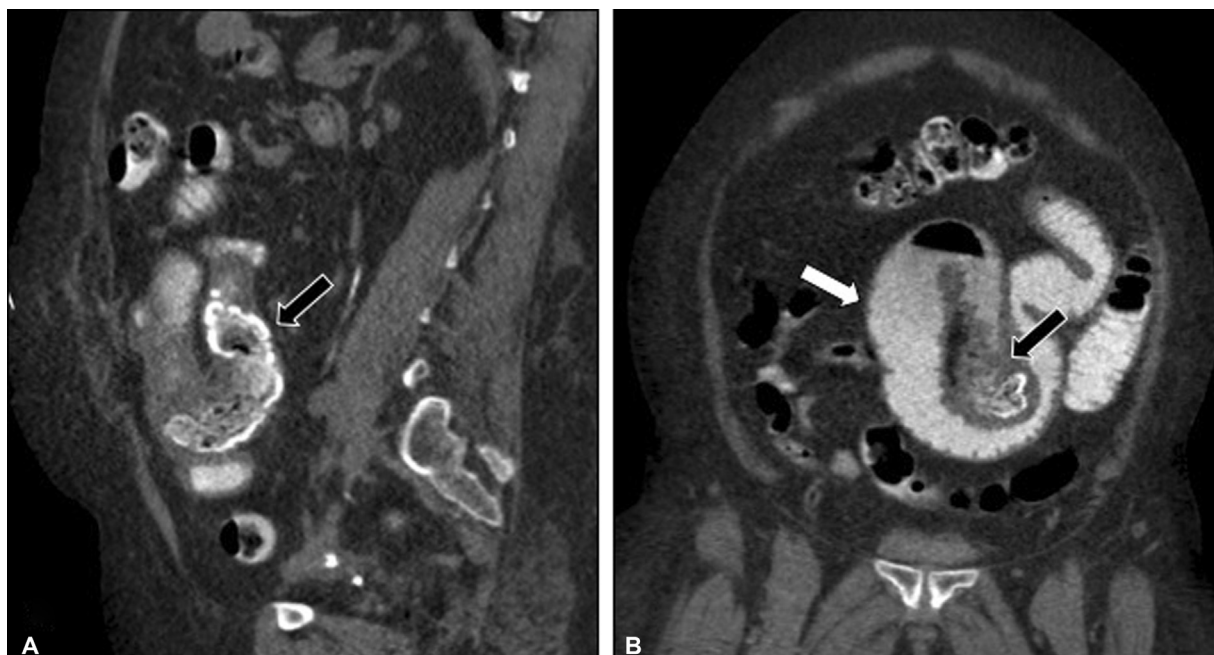
matter (→**Fig. 1**). The repeat onlay mesh repair site was otherwise healthy. She was managed conservatively and discharged. Seven months later, a repeat CT was done for recurrent small bowel obstruction which revealed migration of the previously visualized hyperdense structure in the jejunal lumen more distally with dilated proximal bowel (→**Fig. 2**). Obstruction was again conservatively managed and since the surgeon could not palpate the hard indurated feel of fibrosed initially placed mesh, a possibility of mesh migration into the jejunum was suspected. The patient was kept on close follow-up. After a month, the patient complained of a thread-like structure emerging through the anal canal. On per rectal examination, a hard ball-like mass was felt in the rectum, and suture-like material was visualized. A plain CT of the pelvis was done which showed the intra-

luminal hyperdense structure within the rectal lumen (→**Fig. 3**) with no obstructive changes. No pneumoperitoneum or intra-abdominal collection was seen. Based on the clinical history of recurrent small bowel obstruction and intraluminal migration of the hyperdense material, spontaneous migration of mesh up to the rectum was suspected. The progressive migration of the mesh ball on CT is depicted in →**Fig. 4**

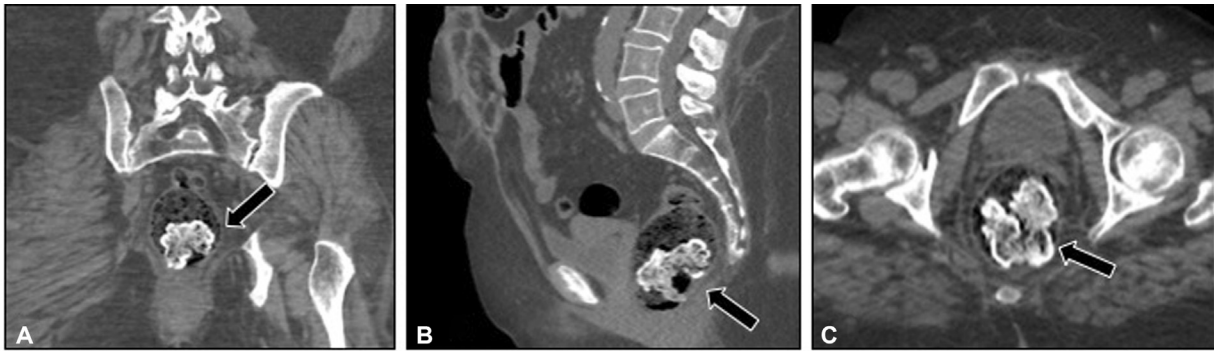
The mesh ball was removed with intact sutures from the rectum under anesthesia (→**Fig. 5**).

## Discussion

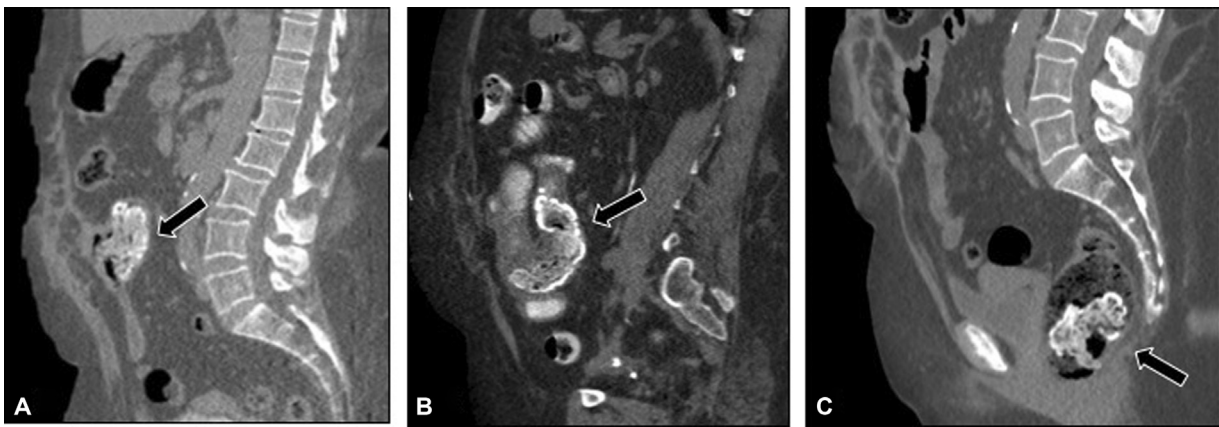
Mesh migration is defined as “mesh that resulted in the invasion of any anatomical region other than the area



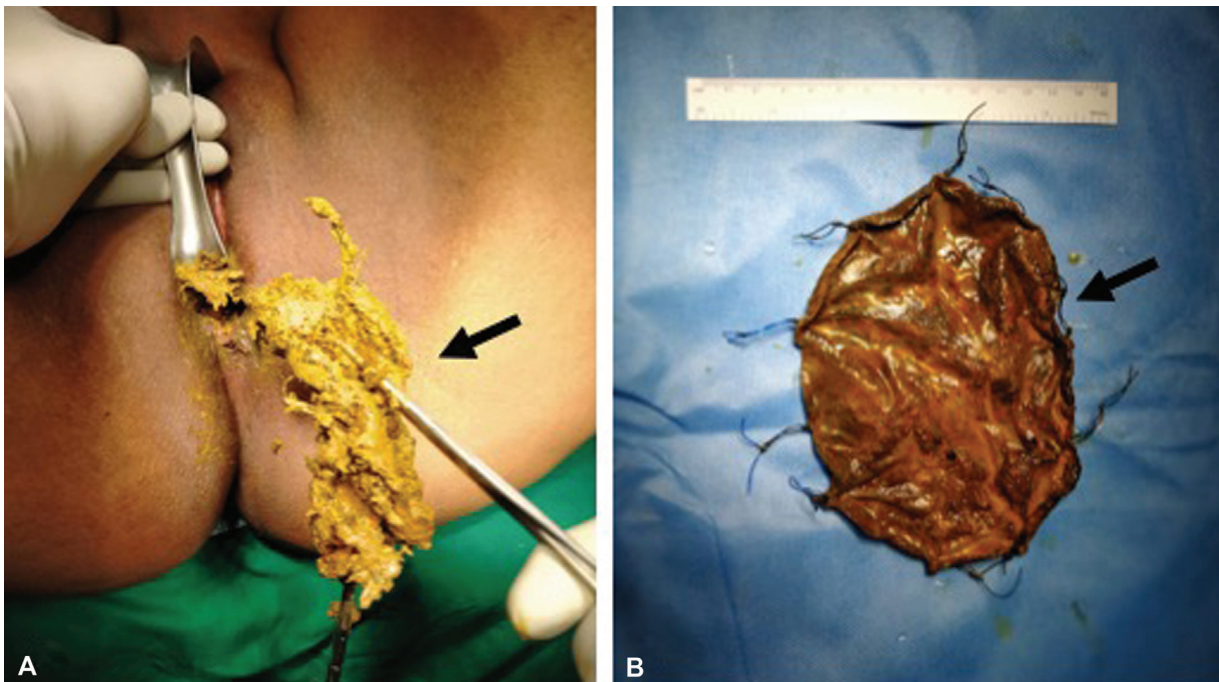
**Fig. 2** Plain computed tomography with luminal positive contrast in sagittal (A) and coronal oblique planes (B) done after 7 months' interval, show migration of the intraluminal hyperdense structure into distal jejunum (black arrow) with mild proximal bowel dilatation (white arrow).



**Fig. 3** Plain computed tomography after 8 months' interval in coronal (A), sagittal (B), and axial planes (C) show further migration of the intraluminal foreign body into the rectum (black arrow). No features of obstruction were seen.



**Fig. 4** Sequential sagittal computed tomography scans on day of presentation (A), 7-month (B) and 8-month (C) show progressive migration of the mesh from jejunum to the rectum (black arrow).



**Fig. 5** (A) Retrieval of the fecal stained mesh (arrow) from the rectum using artery forceps. (B) Intact mesh with sutures (arrow).

intended for the repair.”<sup>1</sup> It usually occurs years after surgery. The probable causes of mesh migration are divided into primary and secondary. Primary is a mechanical migration where an inadequately secured mesh moves along the planes of least resistance. Secondary migration occurs through transanatomical planes as a result of inflammation, infection, and foreign body reaction. Migration across anatomical planes is a very gradual process. Hence, it is often asymptomatic and presents years later postsurgery.<sup>2</sup> Various terminologies are proposed,<sup>1</sup> including mesh “migration” if the whole mesh is displaced into an organ, mesh “erosion” when a portion of the mesh is perforated into an organ while the remaining is outside, and mesh “dislodgement” if the mesh movement is causing recurrence of hernia without involving other organs. Mesh dislodgement can be partial or complete.

Incidence of mesh migration or erosion is 2% of 252 major mesh-related complications following hernia repair in a Food and Drug Administration database review.<sup>3</sup> Symptoms related to the migration of mesh depend on which organ is involved. Erosion into the bowel and urinary bladder are described.<sup>4,5</sup> Migration into the bowel can cause complications such as obstruction, infection, or fistula formation.<sup>4</sup> There is mixed hypothesis on the exact predisposing factors of mesh erosion and migration and commonly include subclinical infection and foreign body reaction.<sup>6</sup> In an experimental study by Wattanasirichaigoon,<sup>7</sup> a surgical sponge was retained in various positions in the abdomen of rats, and migration of the sponge into bowel lumen was found without a hint of infection possibly suggesting a dominant low-grade foreign body reaction.

Imaging plays a major role in suspecting mesh migration. Though most of the polypropylene mesh are isodense to the parietal wall, when the mesh separates from its original placement, it can be identified either by the presence of collection or inflammation around it. Mesh migration with formation of collection is readily detected on ultrasound by the presence of echogenic wavy structure within the fluid. Tackers that are radiodense can help in mesh localization on CT. Mesh adhesion and focal thickening of the visceral wall suggest underlying erosion.<sup>4</sup> Mesh when separates and enters the bowel, acquires hyperdensity likely due to trapping of bowel contents and formation of a mesh ball which can be seen on CT and commonly mistaken for a fecolith. It is important to note that although hyperdense fecoliths are commonly seen in constipated colon, their presence in small bowel especially in the proximal loops must not be ignored as a normal finding, especially when the patient has a history of prior abdominal surgery.

The commonly described treatment of mesh migration is surgical, with or without resection of the involved part. Erosion of mesh into bowel lumen and evacuation of the same by rectum is extremely rare. To the best of our knowledge, two cases with the similar presentation were mentioned in the literature. One of them was the preperitoneal placement of polypropylene mesh evacuated manually from the rectum after 14 years.<sup>8</sup> Another case was polypropylene and expanded polytetrafluoroethylene mesh placed intraperitoneally evacuated from the rectum after 2 years.<sup>9</sup> In

both the above cases primary surgery was open repair and not laparoscopic.

Mesh migration into bowel in a post-laparoscopic repair was reported in two patients<sup>6,10</sup> where composite mesh and polypropylene with expanded polytetrafluoroethylene mesh were used respectively. In both cases, management included surgical resection of the bowel.

To our knowledge, our case is probably the first laparoscopic intraperitoneal composite mesh that migrated and was removed without a surgical procedure. In this case mesh migrated through the longest route, from proximal jejunum to rectum. The predisposing factor in our case was probably infection which occurred postoperatively during the initial hernia repair. Gradual low-grade subclinical infection or foreign body reaction must have caused adjacent (jejunal) bowel erosion and luminal migration with spontaneous healing of the bowel defect. Migration of the mesh ball further down caused intermittent small bowel obstruction symptoms. Once the mesh ball reached the rectum, the sutures were felt by the patient and hence led to successful retrieval without any surgical intervention. The consensus on when to opt for conservative measures or surgical treatment depends on the severity of the obstruction, bowel inflammatory changes suggesting impending perforation, or fistulization.

Because our patient had spontaneously settled episodes of bowel obstructions and the mesh ball was seen well within the bowel lumen on follow-up CT scans, without wall thickening or perforation, expectant management was decided upon avoiding surgical intervention.

## Conclusion

Mesh migration is an uncommon complication of hernia repair. The above case report highlights this rare occurrence where spontaneous migration of mesh to the rectum occurred facilitating retrieval without surgical intervention. It also emphasizes the role of imaging in deciding the management options.

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**Conflict of Interest**  
None declared.

## References

- Cunningham HB, Weis JJ, Taveras LR, Huerta S. Mesh migration following abdominal hernia repair: a comprehensive review. *Hernia* 2019;23(02):235–243
- Gandhi D, Marcin S, Xin Z, Asha B, Kaswala D, Zamir B. Chronic abdominal pain secondary to mesh erosion into cecum following incisional hernia repair: a case report and literature review. *Ann Gastroenterol* 2011;24(04):321–324
- Robinson TN, Clarke JH, Schoen J, Walsh MD. Major mesh-related complications following hernia repair: events reported to the Food and Drug Administration. *Surg Endosc* 2005;19(12):1556–1560
- Patil AR, Nandikoor S, Mohanty HS. Mind the gap: imaging spectrum of abdominal ventral hernia repair complications. *Insights Imaging* 2019;10:40

- 5 Agrawal A, Avill R. Mesh migration following repair of inguinal hernia: a case report and review of literature. *Hernia* 2006;10(01):79–82
- 6 Voisard G, Feldman LS. An unusual cause of chronic anemia and abdominal pain caused by transmural mesh migration in the small bowel after laparoscopic incisional hernia repair. *Hernia* 2013;17(05):673–677
- 7 Wattanasirichaigoon S. Transmural migration of a retained surgical sponge into the intestinal lumen: an experimental study. *J Med Assoc Thai* 1996;79(07):415–422
- 8 Lee Y, Bae B-N. Transmural mesh migration from the abdominal wall to the rectum after hernia repair using a Prolene mesh: a case report. *Ann Coloproctol* 2021;37(Suppl 1):S28–S33
- 9 Horzic M, Vergles D, Cupurdija K, Kopljar M, Zidak M, Lackovic Z. Spontaneous mesh evacuation per rectum after incisional ventral hernia repair. *Hernia* 2011;15(03):351–352
- 10 Persson P, Scrimgeour DSG, Parnaby C. Mesh migration – should it be a mandatory consentable complication? *J Case Rep Images Surg* 2019;5:100057Z12PP2019