

## Illeal conduit associated parastomal hernias: A novel laparoscopic top hat repair

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### ABSTRACT

Parastomal hernias (PH) are a well-known complication following ileal conduit urinary diversion. We present a case report of a woman in her mid-nineties with a symptomatic parastomal hernia at the site of her ileal conduit which was repaired laparoscopically by an inverted top-hat technique. The “top hat” is constructed by assembling a transected ring of synthetic mesh with a secondary mesh cylinder and laparoscopically securing this mesh construct in an underlay fashion. At eighteen months follow-up, the patient remains pain free and without evidence of hernia recurrence.

### Introduction

Despite the relative simplicity of the urinary conduit and stoma concept, ileal conduits are associated with several postoperative complications including stenosis, prolapse, obstruction and herniation. Parastomal hernias (PH) are one of the most common complications associated with ileal conduit diversion and occur in approximately 17% of patients. Common patient risk factors include body mass index (BMI) over 30, female gender, malnutrition, and prior laparotomy.<sup>1</sup>

Many PHs can be managed conservatively by observation alone or by the use of abdominal binders; however, as many as 45% eventually require surgical repair.<sup>2</sup> Open, laparoscopic, and robotic approaches are used in conjunction with a variety of surgical repairs, including the Sugarbaker, keyhole, and the inverted top-hat repair. Here we present a case report of a woman in her mid-nineties with a symptomatic parastomal hernia at the site of her ileal conduit, repaired laparoscopically using an inverted top-hat technique with synthetic absorbable mesh.

### Case presentation

The patient initially underwent a simple cystectomy with ileal conduit for refractory interstitial cystitis. During the seven years since

her cystectomy, the patient was hospitalized five times for small bowel obstruction (SBO). During the patient's fifth hospitalization, she developed incarceration of her large PH (Fig. 1, Images A and B), resulting in bilateral hydronephrosis and distension of the ileal conduit (Fig. 1, Images C and D).

The surgical procedure was performed laparoscopically to minimize the potential for additional hernia formation. A Foley catheter was placed in the ileal conduit to facilitate identification of the conduit during the procedure. Port placement was determined to assure efficiency during the hernia repair. After achieving a pneumoperitoneum, all four ports were placed at least 10cm from the fascial edge of the hernia defect. Lysis of adhesions was performed using the laparoscopic LigaSure dissector (Medtronic, MN, USA). The hernia sac was completely excised and the fascial defect was closed using interrupted absorbable 0-PDS suture. The inverted top-hat mesh construction was assembled on the back table using Phasix mesh (Bard, NJ, USA), Vicryl mesh (Ethicon, NJ, USA), and 2-0 PDS suture. A 15mm laparoscopic port was placed in the upper midline to facilitate deployment of the mesh construct into the abdominal cavity. Fixation was achieved at six points around the Phasix mesh perimeter using the suture passer and 0 PDS sutures (Fig. 2) and an AbsorbaTack fixation device (Medtronic, MN, USA). The Vicryl cylinder of the top hat construction was wrapped

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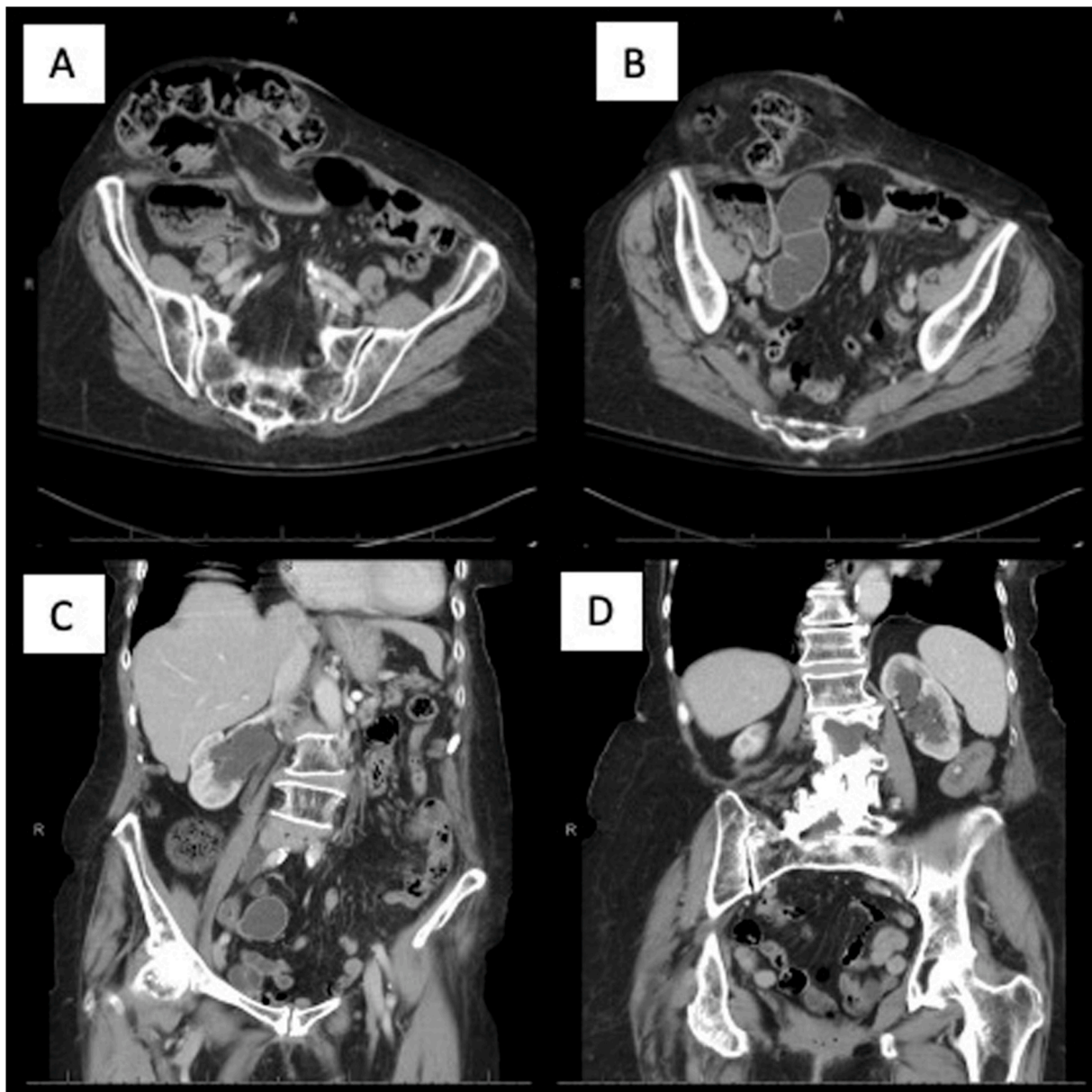
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**Fig. 1.** A. Axial image of parastomal hernia with bowel contents. B. Axial image highlighting the distension/dilation of the ileal conduit, presumably due to the large parastomal hernia. C. Coronal view of right hydronephrosis due to outlet obstruction at the level of the conduit. D. Coronal view of left hydronephrosis from outlet obstruction at the level of the conduit.

around the ileal conduit to complete the mesh repair.

The patient's postoperative course was prolonged due to a postoperative ileus requiring nasogastric tube placement. The ileus resolved on postoperative day 6 and the patient was ultimately discharged to a transitional care unit on postoperative day 9. The patient has been evaluated in the surgery clinic at regular intervals and remains without hernia recurrence at eighteen months.

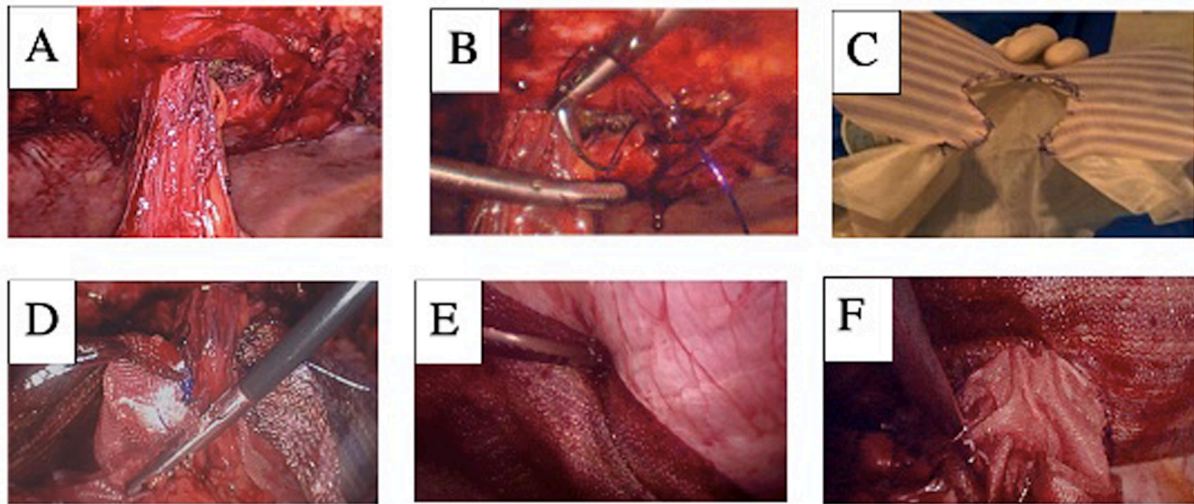
## Discussion

There is a paucity of data for the optimal surgical technique for ileal conduit PH repair, as evidenced by the European Hernia Society (EHS) 2018 guidelines, which did not find strong enough evidence to give any specific direction regarding ileal conduit PH repair.<sup>3</sup> Therefore, surgeons must extrapolate best practices based on the evidence from other types of PH repairs.

The surgical approach and management for ileostomies, colostomies,

and ileal conduits include primary repair, reinforcement with or without mesh (which may be synthetic or biologic), or relocation of the stoma. These approaches may be done open, laparoscopically, or robotically. Primary suture repair has been abandoned due to its high recurrence rate.<sup>3</sup> Relocation of the stoma remains a viable option, although this method still requires closure of the original defect and puts the patient at risk for developing a second PH at the new site.

Laparoscopy has become the favored surgical approach; data shows it to be as safe and as effective as the open approach, with the added benefits of potentially shorter operative times, decreased length of stay, and fewer wound complications.<sup>4</sup> Two commonly utilized techniques of laparoscopic PH repair include the Sugarbaker technique and the keyhole approach. Both techniques involve the application of intraperitoneal mesh; in the Sugarbaker approach, mesh is laid over the bowel as it exits the peritoneum, whereas in the keyhole approach, the bowel exits the peritoneum through a slit in the mesh. The combination of these techniques, or the "sandwich" technique, is an additional



**Fig. 2.** Laparoscopic inverted top hat repair of parastomal hernia. A. Urinary conduit and fascial edges of parastomal hernia after laparoscopic dissection of the hernia sac. B. Laparoscopic suture repair of the hernia defect. C. Back bench inverted top hat synthetic mesh construct. D. Laparoscopic initial placement of mesh construct. E. Laparoscopic fixation of the medial edge of the mesh. F. Final position of the inverted top hat mesh construct.

alternative and has similar outcomes to its predecessors. The EHS states in their 2018 guidelines, when approached laparoscopically, “there is evidence favouring the use of a mesh without a hole in preference to a keyhole mesh...” in PHs.<sup>3</sup>

The inverted top hat repair is a relatively new technique for the repair of PHs. This approach aims to prevent PH recurrence through its reinforcement of the vulnerable edge between the bowel loop leading to the stoma and the fascial edge of the defect. This approach has theoretical advantages over both the keyhole and Sugarbaker techniques, in that the former does not address that vulnerable edge and the latter carries an increased risk of urinary outflow obstruction.

Data on the inverted top hat repair are limited and based on case series and case reports, such as ours. The largest series consists of 40 patients with ileal conduit PHs who underwent open repair utilizing an alloplastic mesh. Twenty-seven patients were available for analysis who had complete follow-up data; 2 patients (7.4%) had PH recurrences.<sup>5</sup> This recurrence rate is less than the historical rates of recurrence, which are reported to be up to 50%.<sup>1</sup> In contrast to this series, we elected the laparoscopic approach to reduce the chance of additional hernias and used absorbable synthetic mesh to avoid potential erosion of the mesh into bowel.

## Conclusion

Although broad conclusions cannot be drawn from a case report, our report demonstrates that the laparoscopic inverted top hat repair is a feasible and effective method for ileal conduit PH repair, even in elderly

patients with large, symptomatic hernias.

## Authors' contributions

All authors have read and approved the final version of the manuscript.

## Declaration of competing interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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