Pericecal hernia manifesting as a small bowel obstruction successfully treated with laparoscopic surgery

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Abstract
A pericecal hernia is a type of internal hernia, which rarely causes small bowel obstruction (SBO). At our institution, a 92-year-old man presented with vomiting and abdominal pain. He was conservatively treated with a diagnosis of SBO. After 2 weeks of copious drainage output, he was taken to the operating room. Laparoscopy revealed a pericecal hernia that was successfully reduced. We conclude that laparoscopic surgery is an effective way to treat SBOs secondary to pericecal hernias.

INTRODUCTION
Internal hernias are an infrequent cause of small bowel obstruction (SBO) [1]. Pericecal hernias, also known as paracecal hernias, are an exceptionally rare type of internal hernia [2]. Because of the difficulty in establishing a working space and visualizing the site of obstruction along with the risk of injury to the distended bowel, laparoscopy for SBO was previously considered inappropriate [3]. We present a case of successful laparoscopic treatment of SBO due to a pericecal hernia in an elderly man.

CASE REPORT
A 92-year-old man, with a distant history of cholecystectomy secondary to cholecystitis, presented to an outside hospital with vomiting and abdominal pain. He was treated conservatively with a nasogastric tube and a long intestinal tube for 2 weeks. The amount of drainage, however, remained over 1500 ml per day, and he was referred to our hospital. On examination he was afebrile, and his abdominal examination revealed no tenderness or palpable masses. Laboratory tests showed a normal white blood cell count and normal C-reactive protein. Computed tomography with intravenous contrast showed dilated loops of the small bowel with the tip of the long intestinal tube reaching the transition point, which appeared to be at the distal ileum. Exploratory laparoscopy was performed and revealed a segment of small bowel ~100 cm proximal to the ileocecal valve that was entrapped in the retrocecal fossa (Fig. 1A–D). The incarcerated small bowel was laparoscopically reduced and noted to be viable. The hernia orifice was opened and dilated to prevent recurrence. His postoperative course was uneventful, and he was discharged home on postoperative day 10.

DISCUSSION
The overall incidence of internal hernia found on autopsy ranges from 0.2 to 2%, most of which are asymptomatic [1]. Internal hernias are the cause of SBO in ~0.5–5.8% of cases [1]. Pericecal
hernias are responsible for 0.1–6.6% of internal hernias [2]. There are several explanations regarding the pathogenesis of the pericecal fossa, including disruption of the normal process of intestinal rotation during embryonic development, tissue fragility due to aging, pressure elevation of the inner abdomen, retroperitoneal adhesion, post-abdominal surgery and vascular changes [2]. The pericecal area is generally classified into four subtypes: superior ileocecal recess, inferior ileocecal recess, retrocecal recess and paracolic sulci [4]. Several authors also include two other types: cecal fossa and cecal recess [2]. Our patient had a retrocecal hernia.

We searched the National Library of Medicine MEDLINE database for relevant studies in English published prior to 1 January 2015 using the following medical subject headings and key words: ‘paracecal hernia’, ‘pericecal hernia’, ‘paracolic hernia’, ‘ileocelec hernia’, ‘retrocecal hernia’ or ‘ileocelec hernia’. All abstracts were reviewed, and all relevant articles were carefully examined. Moreover, relevant articles were searched from references of the selected articles. There were 28 cases reported in the literature further classified as an inferior ileocecal recess, retrocecal recess and paracolic sulci in 2, 8 and 12 cases, respectively (Table 1). The mean age was 56.6 years old (range 0–90), making our patient the oldest reported case.

Internal hernias are difficult to diagnose preoperatively due to nonspecific clinical manifestations. Successful preoperative diagnoses were made in only seven cases. In our case, the patient had a previous history of a cholecystectomy, although adhesive disease was not considered to be the cause of SBO. Historically, hernia fossas were suture closed, and in our review, the hernia oriﬁces were sutured in 11 cases and left open in 6 cases. Presently, the trend is to either leave the hernia open or dilate the hernia because of technical ease. We enlarged the retrocecal fossa in our patient to avoid recurrence. To our knowledge, there were only two reported cases who were treated with laparoscopy alone.

Because of the difﬁculty in establishing a working space and visualizing the site of obstruction and the risk of injury to the distended bowel, laparoscopy for SBO was previously considered inappropriate [3]. More recent systematic reviews comparing laparotomy and laparoscopy for SBO revealed that laparoscopy has a lower morbidity, a shorter postoperative hospital stay and a faster return of bowel function. They concluded that laparoscopy is a feasible alternative to laparotomy for acute SBO when performed by experienced surgeons [3]. A key to our success may have been preoperative decompression of the dilated bowel via a long intestinal tube, and as a previous report suggests, we believe that preoperative decompression is useful in selected patients to broaden working space and reduce the risk of injury [5]. In conclusion, laparoscopy is a viable option to reduce pericecal hernias.

**ACKNOWLEDGEMENTS**

We thank James Masterson, M.D., United States Naval Hospital Yokosuka, for English editing; Kris Sirirattisivawong, M.D., United States Naval Hospital Yokosuka, for surgical advice; Sandra Y. Moody, M.D., B.S.N., Kameda Medical Center, for English editing.
| Year | Age (years) | Patient gender | Preoperative diagnosis | History of abdominal surgery | Authors | Classification of pericecal hernias | Operation performed | Fossa was sutured or not |
|------|-------------|----------------|-----------------------|-------------------------------|---------|------------------------------------|---------------------|--------------------------|
| 1935 | 54          | Male           | Bowel obstruction     | NA                            | Charles S, et al. | Retrocecal                      | NA                  | Sutured                  |
| 1957 | 60          | Male           | NA                    | Appendectomy                  | Tidler HS, et al. | Retrocecal                      | Laparotomy          | NA                       |
| 1960 | 43          | Male           | SBO                   | NA                            | Florian P, et al. | Retrocecal                      | Laparotomy          | Sutured                  |
| 1966 | 82          | Female         | NA                    | None                          | Lawler RE, et al. | Retrocecal                      | Laparotomy          | NA                       |
| 1971 | 23          | Female         | Ileocecal hernia      | NA                            | Nathan H, et al.  | NA                               | Laparotomy          | Sutured                  |
| 1976 | 8           | Male           | NA                    | NA                            | Rubin SZ, et al.  | Paracecal                       | Laparotomy          | NA                       |
| 1976 | 57          | Male           | Diverticulitis        | None                          | Bass J Jr, et al. | Inferior ileocecal hernia       | Laparotomy          | Sutured                  |
| 1982 | 80          | Female         | NA                    | None                          | Rosen L, et al.   | Retrocecal                      | Laparotomy          | Sutured                  |
| 1983 | 67          | Female         | Hydrocholecyst        | NA                            | Jamart J, et al.  | Paracecal (short’s)             | Laparotomy          | NA                       |
| 1986 | 0           | Female         | NA                    | NA                            | Rivkind AI, et al.| Paracecal                       | Laparotomy          | NA                       |
| 1986 | 8           | Male           | NA                    | NA                            | Rivkind AI, et al.| Paracecal                       | Laparotomy          | No suture                |
| 1986 | 25          | Male           | NA                    | NA                            | Rivkind AI, et al.| Paracecal                       | Laparotomy          | NA                       |
| 1986 | 77          | Female         | Paracecal hernia      | NA                            | Rivkind AI, et al.| Paracecal                       | Laparotomy          | NA                       |
| 1986 | 83          | Female         | NA                    | NA                            | Rivkind AI, et al.| Paracecal                       | Laparotomy          | Sutured                  |
| 1997 | 86          | Female         | SBO                   | NA                            | Lindsay I, et al. | Retrocecal                      | Laparoscopy         | No suture                |
| 2000 | 59          | Male           | ileus                 | None                          | Patterson R, et al.| Paracecal                       | Laparotomy          | NA                       |
| 2002 | 69          | Male           | Pericecal hernia      | None                          | Lu HC, et al.     | A                                | Laparotomy          | NA                       |
| 2002 | 67          | Female         | Pericecal hernia      | Appendectomy                  | Lu HC, et al.     | Paracecal                       | Laparoscopy         | NA                       |
| 2003 | 90          | Female         | SBO                   | None                          | Omori H, et al.   | Paracelal                       | Sutured             |
| 2005 | 76          | Male           | SBO                   | None                          | Osadchy A, et al. | Paracelal                       | Laparotomy          | Sutured                  |
| 2006 | 34          | Male           | Inferior ileocecal hernia | None                        | Fu CY, et al.     | Inferior ileocecal hernia       | Laparotomy          | Sutured                  |
| 2007 | 59          | Female         | Paracecal hernia      | None                          | Molto Aquado M, et al. | Paracelal                       | Laparotomy          | Sutured                  |
| 2007 | 74          | Male           | SBO                   | Appendectomy                  | Hirokawa T, et al. | Retrocecal                      | Mini-laparotomy     | No suture                |
| 2010 | 43          | Female         | SBO                   | Invagination                  | Kabashima A, et al. | Paracelal                       | Mini-laparotomy     | No suture                |
| 2010 | 63          | Male           | SBO                   | NA                            | Shibuya H, et al. | Retrocecal                      | NA                  | Sutured                  |
| 2010 | 65          | Female         | Pericecal hernia      | NA                            | Choh NA, et al.   | NA                               | Laparotomy          | Sutured                  |
| 2011 | 84          | Female         | NA                    | None                          | Jang EJ, et al.   | Paracelal                       | No suture           |
| 2011 | 70          | Female         | Internal hernia       | None                          | Nishi T, et al.   | NA                               | Laparotomy          | No suture                |
| 2013 | 34          | Male           | SBO                   | None                          | Kleyman S, et al. | NA                               | Laparotomy          | NA                       |

SBO, small bowel obstruction; NA, not available.
CONFLICT OF INTEREST STATEMENT
None declared.

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