Laparoscopic enteropexy for prolapsing stoma (LEPS). A case series describing a novel technique

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Abstract

Background:

Ileostomy prolapse has a cumulative risk of 11% and represents a significant complication with associated morbidity, which may result in multiple admissions and procedures requiring a general anaesthetic. We have developed an laparoscopic technique for managing stoma prolapse – so-called Laparoscopic Enteropexy for Prolapsing Stoma (LEPS.)

Methods:

Retrospective analysis of a prospectively maintained departmental surgical logbook was performed alongside clinical case history review for patients undergoing LEPS. Primary outcome was defined as recurrent prolapse. Secondary outcomes were any post-operative complication or complication occurring at the time of stoma closure.

Results:

15 LEPS procedures were performed on 14 patients with stoma prolapse – 13 were patients with ileostomy and one with a loop colostomy. Median operative time was 75 minutes (range 50 – 95). Post-operative stay was 1 days (1-4 days).

There was one return to theatre for a small bowel intussusception on the second post-operative day where taking down of the bowel and repeat LEPS was necessary. There was one recurrence of prolapse in a separate patient (1/14 [7%]). Three patients have since had their stoma closed without complication.

Conclusion:

We describe here the initial case-series of our LEPS procedure for managing stoma prolapse. This is a reproducible and technically straight-forward laparoscopic procedure with an excellent success rate in preventing further prolapse.

Introduction

Ileostomy prolapse is the most common complication of ileostomy requiring operative intervention[1], with a cumulative risk of 11%[2], and may result in multiple admissions and the need for reduction or revision under general anaesthetic. For those children in whom a stoma may be long-term, or even permanent, this represents a significant long term risk. Repeated entry into the peritoneum is associated with adhesion formation and, in the context of children with conditions such as intestinal pseudo-obstruction, may prejudice the domain of the abdomen for future therapy such as bowel transplantation.

In 2005, the senior author presented a report of a novel technique to treat stoma prolapse by suturing the loop of the prolapsing stoma to the posterior aspect of the abdominal wall using a minimally invasive technique, the laparoscopic enteropexy for prolapsing stoma (LEPS) [3]. We sought to describe our experience and patient outcomes with this technique in the intervening 12 years.

Methods

We performed retrospective analysis of all cases of laparoscopic fixation of stoma, noting baseline demographics and diagnoses, information about the stoma prolapse prior to the LEPS procedure, details of the operative procedure, and any complications noted in the subsequent follow-up.

We defined primary outcome as a need for further surgery for prolapse and secondary outcome as any reported form of minor recurrent prolapse not yet requiring any intervention, as well as any complications of the surgery itself – including wound complications.

We were unable to gain surgical operative time for all patients so used total GA time available from the anaesthetic charts as a surrogate for the duration of surgery. We measured post-operative stay to the nearest day – but excluded long term in patients who had surgery for prolapse in the midst of a protracted hospital stay.

Follow-up duration was defined as the time to the last clinic review in a child with a stoma, or the time to open revision or closure of the stoma in the event of either of these.

Operative Technique

A 5mm Hasson port is placed, using an open technique in the left flank for camera access. Two further 5mm working ports are placed in the left upper quadrant and left iliac fossa (Fig.1). The peritoneum at the back of the anterior abdominal wall is opened for 10cm and the ileum immediately proximal to the stoma is stitched to the newly exposed anterior abdominal wall at the free edge of the peritoneum with interrupted 3-0 prolene (Fig. 2). Laparoscopic ports are routinely closed with vicryl sutures and Indermil™ glue.

Results

Patients' demographics and details related to the initial stoma, prolapse and subsequent LEPS procedure are displayed in Table 1. Prior to the LEPS procedure, all patients had suffered recurrent prolapse of the stoma, 4 had required a general anaesthetic in order to achieve reduction.

All but one of the patients had an ileostomy, one patient had a colostomy for persistent incontinence post re-do Duhamel pull-through for Long-segment Hirschsprung's Disease with Down Syndrome.

Table 1. Patient demographics (n=14), data displayed as median (+ range)

Diagnosis	
Intestinal Dysmotility	7
Chronic Intestinal Pseudo-obstruction	2
Constipation	2
Midgut volvulus + resection	1
Spina bifida occulta	1
Hirschsprung's (*colostomy* post re-do Duhamel)	1
First stoma	
Age at initial stoma formation	4.4 years (1.75 – 12.1 years)
Time to first stoma prolapse	53 days (22 days – 15 months)
LEPS	
Time to LEPS after first prolapse	42 days (3 days – 9 months)
Age at LEPS procedure	4.7 years (2 years – 12.3 years)
Operative Time (total GA time)	75 minutes (50 – 95)
Length of post-operative stay	1 days (1 - 4 days)
Recurrent prolapse	1 / 14 (7%)
Follow-up	20 months (3 months – 7.3 years)

Complications

There was one immediate failure on the 2nd post-operative day. This patient continued to have pain and signs of obstruction and was re-explored. An intussusception was found just proximal to the stoma which was then reduced and the bowel again fixed to the back of the abdominal wall with no subsequent complications including prolapse.

A second patient had a single episode of stoma prolapse, reduced on the ward on day 163. This stoma was revised on day 175 at the same time as an elective open colectomy.

We had no wound infections and no complications of bleeding. 3 patients have had their stoma closed without complication.

Success rate

The success of LEPS at preventing further prolapse was 93%. We report one immediate complication requiring emergent surgery and one case of prolapse post-surgery which did not require immediate surgical intervention.

Discussion

Existing management of stoma prolapse for the most part involves simple manual reduction with adequate pain control. More recently the use of osmotic agents has been widely adopted for reduction of oedema to facilitate manual reduction[4–6]. Failure to achieve this in an awake or sedated patient indicates a general anaesthetic to ensure complete reduction. If reduction under anaesthetic is not possible, surgical exploration and revision may be required, which may involve bowel resection[7].

Various strategies have been suggested for the surgical management of patients suffering from recurrent, reducible prolapse. Several groups have described resection of the redundant bowel and resiting of the stoma, often using a linear stapling device [8,9]. However, this strategy has only been reported in adult patients, whereas preservation of bowel length is a major consideration in young children. More complex techniques have been employed in adults; such as extra-peritonealisation of the prolapsing loop and plication of the loops of intestine immediately proximal to the stoma[10]. Such techniques require a major laparotomy, made technically more challenging by the size of the patient (the median age of our cohort was 4.7 years at the time of LEPS.)

This case-series represents, to the authors' knowledge, the first describing a success rate of a procedure for ileostomy prolapse, and is also the only series describing outcomes in an exclusively paediatric cohort. There are several individual case reports describing novel techniques for managing prolapse [10,11], however previously reported series describe techniques used as a revision strategy for a variety of complications and do not describe specific outcomes for prolapse[9,12,13]. A recently published systematic review acknowledges very scarce literature in the paediatric age-group referring to surgery for stoma prolapse. The author of this review notes that in other surgical procedures which avoid laparotomy, recurrence approaches 50%[14].

Prolapse is known to correlate with poor quality of life outcomes in patients with a long-term stoma[15], with patients demonstrating reduction in both physical and mental component scores of the generalized quality of life questionnaire SF-36[16], as well as a significantly lower scores when assessed with Gastrointestinal Quality of Life Index (GIQLI)[17]. We note that from this select series that prolapse in this group of children happens relatively early after initial stoma formation and this may prompt the attending surgeon to consider surgery addressing the issue early in the patient journey.

Young patients with severe gastrointestinal dysmotility often have severely disrupted education and social development, because of frequent and lengthy admissions with uncontrolled symptoms[18]. This group are also thought to be more susceptible to stoma prolapse[19]. Reducing the incidence of mechanical issues with stomata in this population serves to maximize their time at home and school which must be a priority in the holistic management of such children.

The LEPS technique is technically straight-forward for a surgeon with a moderate to high level of laparoscopic ability. The domain of the abdomen is preserved and most children may be discharged within 24 to 36 hours post-operatively. There have been 2 other individual published cases where our technique has been used; the authors from the first centre described in 2013 this technique to manage a loop

colostomy prolapse[20]. The authors from a second institution elected to suture the small bowel mesentry as opposed to the bowel itself – citing a possible risk of fistula formation[21]. We have not seen this complication in our series. Neither of these reported cases note any post-operative complication.

One potential difficulty we have envisaged with this technique is the mobilization of the afferent bowel when reversing the stoma. We have been careful in our operative documentation to make note of the direction in which the bowel has been fixed to the abdominal wall. It has been possible to complete stoma closure in the three cases in this series without complication based on this knowledge.

There are limitations which are inherent of a study of this kind. Clearly, presenting descriptive data as a case series, we are unable to deliver a recommendation of our technique over another strategy. The nature of retrospective data means that follow-up is non-uniform, and while some of our patients have been seen in the clinic for over 5 years, others are still in the early post-operative months. We believe laparoscopic fixation would certainly produce lower morbidity compared to larger incisions associated with local revision or a procedure requiring a laparotomy. This approach is now the authors' first choice method to manage prolapse and we feel that it is straight forward and reproducible by any experienced laparoscopist.

Figure 1. Operative port placement for right sided ileostomy

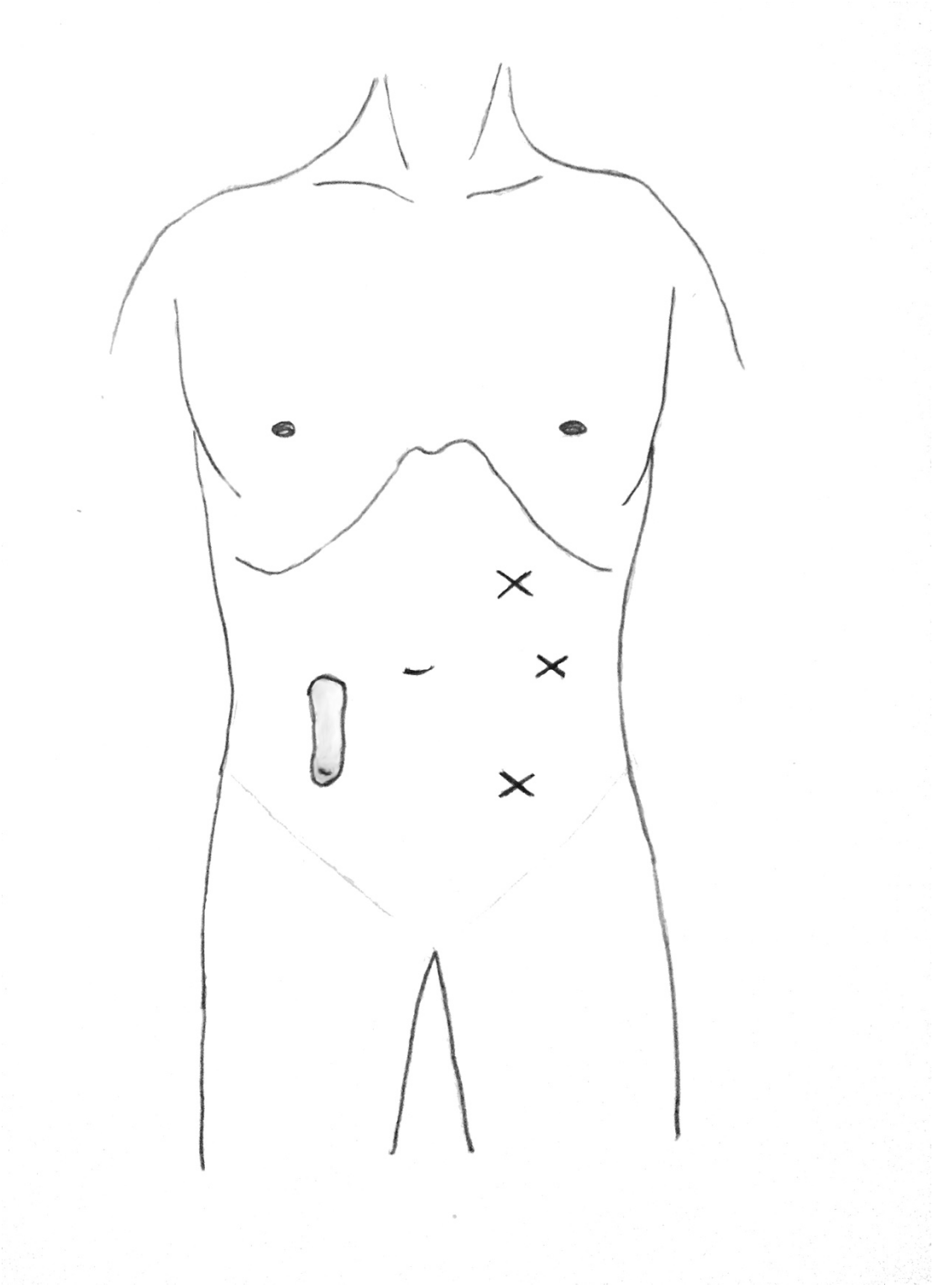
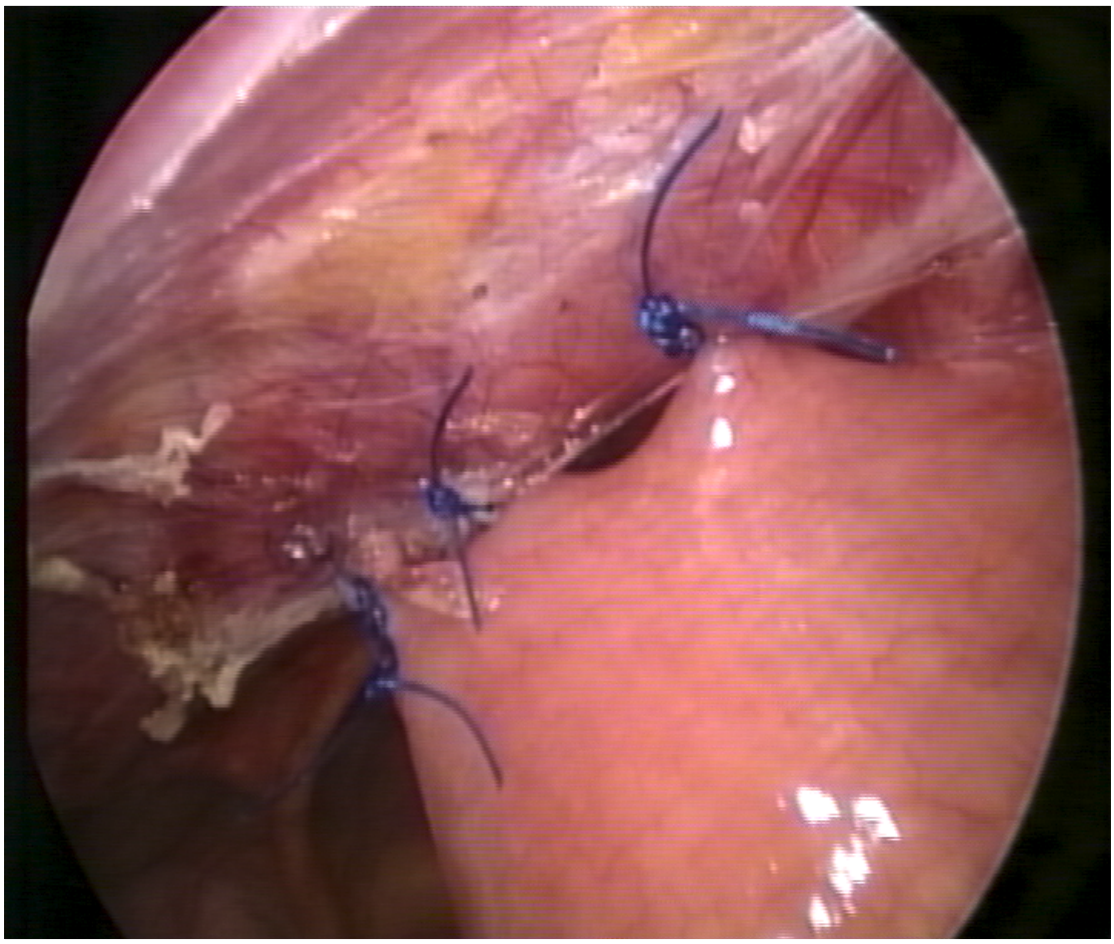


Figure 2. The ileum is sutured laparoscopically to the free edge of the peritoneum



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