



Ileo-anal pouch excision and permanent ileostomy – Indications and outcomes from a tertiary centre

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ABSTRACT

Purpose: Pouch excision is a major complication of ileoanal pouch surgery. Current practice is for this type of surgery to be performed in a specialist centre. We present a series of patients undergoing pouch excision surgery in a high volume centre in the UK and assess the outcomes in these patients.

Methods: All patients undergoing pouch excision at the Royal Liverpool Hospital between 1995 and 2015 under the care of a single surgeon were included. Demographics and outcomes were taken from patients' notes and a dedicated retrospectively compiled database.

Results: 35 patients underwent pouch excision surgery during this period. Around half the patients had their original pouch surgery elsewhere and were referred for management of complications. Median time to pouch excision was 13 years from the original operation. Overall complication rate was 31% with 11% requiring re-intervention post-operatively. There was no mortality in this series.

Conclusion: Pouch excision is a complex, high-risk procedure that should be carried out in specialist centres. Our series shows that in such settings, good outcomes can be achieved for these patients.

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Introduction

Ileo-anal pouch (IAP), also known as restorative proctocolectomy, is indicated following total colectomy for ulcerative colitis (UC) and patients with familial adenomatous polyposis (FAP) or hereditary non-polyposis colorectal cancer (HNPCC), who are at risk of inherited colorectal cancers. IAP can significantly improve quality of life¹ but also associated with considerable morbidity in up to 50% of patients.² IAP complications have previously been studied and reported by several high volume centres.^{3–5}

One of the more feared complications following creation of an ileal pouch anal anastomosis (IPAA) is pouch failure. This can be as a result of many factors and is defined as functional failure of the pouch requiring pouch excision (PX) or permanent diversion. Rates of pouch failure vary widely in the published literature from 2 to 22%.^{6,7} A review of the literature in 2015 looked at some of the common reasons for a patient to

undergo pouch excision and grouped them into technical or disease-related causes.⁶

Pouch failure may be treated by either permanent diversion or excision. Diversion offers less operative morbidity, but the patient may be left with chronic symptoms from the pouch such as discharge or perineal sepsis. Pouch excision may be a primary treatment for pouch failure, but is often reserved after revisional attempts to improve function have failed, as it is a far more morbid operation, with significant operative risk and the creation of a permanent ileostomy.⁸

Diversion surgery is part of the management of patients with failing pouches, the amount of patients who have had diversion surgery without going on to having pouch excision is not reflected in this paper and would have to be addressed separately.

Our institution is a regional centre for IPAA surgery. Patients in whom IPAA were created in other hospitals are referred for specialist opinion if pouch failure is suspected. We

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report our operative experience in pouch excision and assess operative morbidity and long-term functional outcomes.

Methods

A retrospective review of all patients undergoing excision of their IAP under the care of the Inflammatory Bowel Disease (IBD) surgical team at the Royal Liverpool Hospital from 1995 to 2015 was conducted.

Details of patient demographics, indications for pouch surgery and subsequent complications that eventually led to pouch excision were collected from medical records. Further details of pouch excision surgery and post-procedure complications were analysed according to the Clavien-Dindo (CD) classification. Data presented as median (range). Follow-up data is available until 31 December 2017. During follow-up, all patients have blood samples taken to check serum B12, renal function tests including estimated Glomerular Filtration rate (eGFR).

Pre-operative counseling and consenting is held in great detail in a dedicated Pouch clinic led by a multi-disciplinary team of three Surgeons, gastroenterologist and Pouch Specialist Nurse prior to the procedure.

Pathological re-examination of proctocolectomy and IPAA was conducted on all patients who underwent PX surgery.

PX surgery

Patients were placed in Lloyd –Davies position. Venous thrombo-prophylaxis and antibiotic prophylaxis were administered. Ureteric stents were selectively used. Pouch was catheterized, emptied and washed with betadine in all cases. The abdominal component of the operation involved careful adhesiolysis (many had very dense adhesions but there were no enterotomies made) and mobilisation of pouch isolating the feeding vessels and carefully avoiding pelvic nerves, ureters and gonadal vessels. As with any re-operative surgery, pouch excision in the pelvis can be extremely challenging and difficult. Where there was a previous Total Mesorectal Excision (TME) type rectal excision the pouch was tightly applied to the sacrum and pelvic floor, in those where there had been a close rectal dissection remnants of the

mesorectum remained as did the fascia between the fat and the sacrum. In either setting, it is still important to try and identify the sacral nerves if possible and avoid them. If this is not possible, then close pouch dissection up to pelvic floor can be adopted to avoid nerve injury. On reaching the pelvic floor, the perineal component involved inter-sphincteric dissection although this was not always possible due to fibrosis and sepsis but the aim was to leave as much pelvic floor muscle as possible. During closure, levator ani muscles were opposed followed by subcutaneous fat and skin. None of the patients had myo-fascial or skin flaps.

Results

During the study period, 35 patients (17 male/18 female) underwent excision of their IAP (Table 1). The median age of patients at the time of their original IPAA surgery was 32 (range 17–63). The original indication for surgery in this group was predominantly ulcerative colitis (UC), accounting for 77% (n = 27) of the cohort. Less common indications included FAP (17%, n = 6), HNPCC (3%, n = 1) and indeterminate colitis (3%, n = 1).

Almost all IPAA were of the J-pouch configuration (34/35) with a single S-pouch configuration.

The median age at PX was 46 (19–79) years. Median pouch survival in patients requiring excision was 13 (2–29) years. Median length of hospital stay was 11 (5–270) days following pouch excision.

Over half of the patients (20/35, 57%) had their original IPAA surgery at our institution, with the remaining 43% having the IPAA created at another hospital.

During the study period, 243 ileo-anal pouches were created in our institution. In the same time period, 20 of them required pouch excision as management of pouch failure resulting in an excision rate of 8.2%. Four of these patients had redo-IPAA which also failed prior to PX.

We have classified pouch failure requiring pouch excision into early (<5yrs post-IPAA), and late (>5yrs post-IPAA) failure (Fig. 1).

There were 10 patients (28%) who had excision of their pouch less than 5 years after their index operation. In half of these patients (5/10) problems with sepsis secondary to anastomotic complications were identified. The remaining

Table 1 – Indication for pouch excision.

	Early (<5 yrs), 10 patients	Late (>5 yrs), 25 patients
Malignancy	<ul style="list-style-type: none"> • Adenocarcinoma of cuff (n = 1) 	<ul style="list-style-type: none"> • Endometrial cancer invading pouch (n = 1)
Functional	<ul style="list-style-type: none"> • Poor function potentially secondary to technique (n = 2) • Poor function for no obvious reason (n = 2) 	<ul style="list-style-type: none"> • Chronic pouchitis (n = 8) • Polyp causing pouch obstruction (n = 1) • Chronic fistula (n = 2) • Structuring (n = 4) • Poor sphincter (n = 4) • Crohns (n = 1) • Poor function for no obvious reason (n = 1)
Sepsis	<ul style="list-style-type: none"> • Sepsis secondary to anastomotic leak (n = 3) • Anastomotic leak leading to fistula (n = 2) 	<ul style="list-style-type: none"> • Chronic pelvic sepsis (n = 3)

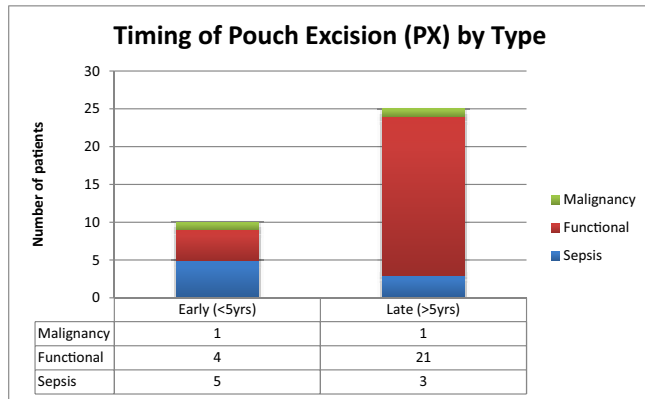


Fig. 1 – Timing of pouch excision by type.

patients, 4 had unsatisfactory functional outcomes and requested excision post counselling. The histology of these pouches was essentially normal showing only adaptive changes. One patient with FAP developed early cancer in the cuff and had the pouch removed to facilitate cure.

The remaining 25 patients had late excision of their pouch. The vast majority (21/25) were secondary to a variety of functional problems including strictures, fistulae, incontinence, pouchitis and poor function. Three patients had excision due to chronic pelvic sepsis and 1 patient who had HNPCC developed endometrial cancer that invaded the pouch.

Complications following PX

Early complications (<30 days)

Post-operative complications were graded as per Clavien-Dindo Classification (Table 2).

Grade I (n = 3): 2 patients developed wound related problems – wound infection (n = 1) and delayed wound healing (n = 1) managed by simple measures. 1 patient developed intestinal obstruction – managed conservatively.

Grade II (n = 4): 2 patients required blood transfusion post-operatively. 1 patient developed wound infection treated with

Table 2 – Complications following pouch excision.

Grade of Complication	Complications
I (n = 3)	Wound infection Delayed wound healing Post-operative ileus
II (n = 4)	Blood transfusion (n = 2) Wound infection requiring IV antibiotics Pelvic abscess requiring antibiotics
IIIa (n = 1)	Stricture requiring endoscopic dilatation
IIIb (n = 3)	Laparotomy for small bowel obstruction Orchidectomy for ischaemic testicle Ureteric injury requiring ante-grade stents
IV	None
V	None

intravenous antibiotics. 1 patient, who had tubo-ovarian abscess and pouch-vaginal fistula pre-operatively, developed pelvic abscess which was managed with antibiotics.

Grade IIIa (n = 1): 1 patient developed small bowel stricture, which was dilated endoscopically.

Grade IIIb (n = 3): 3 patients were taken back to theatre – 2 patients underwent laparotomy for small bowel obstruction post-PX and orchidectomy for ischemic testicle respectively. 1 patient had ureteric injury; ureteric stenting was attempted in this patient intraoperatively but was difficult and therefore abandoned prior to PX. This patient went onto have ante-grade stenting and recovered well.

There were no 30 or 90-day mortality reported in this series.

Late complications (>30 days)

On discharge from hospital, 2 patients had a high output stoma, 1 of these patients required parenteral nutrition and the other was discharged back to referring hospital. On follow-up, 3 patients had persistent perineal sinus (initial pathology were FAP (n = 1) and UC (n = 2)). This caused minimal symptoms and therefore intervention was not required.

Follow-up

The median follow-up after pouch excision was 23 (0–244) months. This was performed in a nurse-led clinic by a dedicated Pouch Nurse, run alongside the surgical clinic. Serum B12 levels were available in 21 patients and remained at median of 388 (174 - >2000)pg/ml. Serum eGFR was available in 30 patients and was at a median of 78 (22- >90) (Fig. 2).

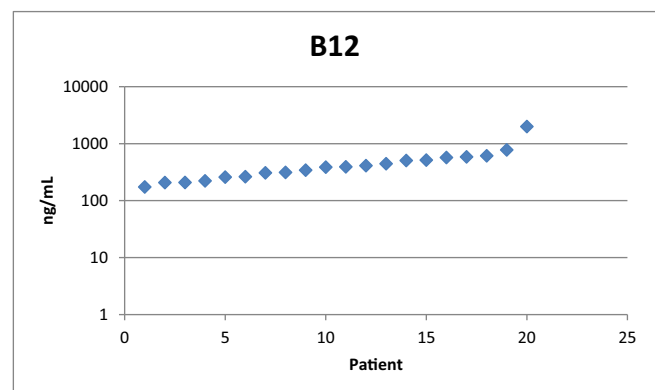
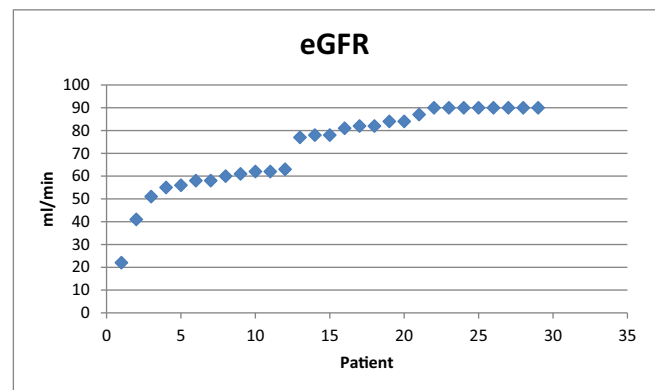


Fig. 2 – Post-excision biochemical indices.

Thirteen patients have been discharged and 16 patients remain under follow-up. 3 patients who were referred from other hospitals have been lost to follow-up. 3 patients have died (1- metastatic disease from endometrial cancer, 1- Myocardial infarction, 1- unknown).

Discussion

Provision of IPAA surgery is increasing under the spotlight in the wake of the Association of Coloproctology of Great Britain and Ireland's (ACPGBI) Ileo-anal Pouch Report published in 2017.⁹ This review of services highlighted the wide variation in experience and practice of surgeons performing this procedure and a variation in subsequent complications, leading to a call for IPAA surgery to be centralised regionally to specialist units as only 3 surgeons performed more than 10 cases in the year. The service at the Royal Liverpool Hospital is led by a team of three colorectal surgeons with a specialist interest in IBD and supported by a dedicated Pouch Nurse who provides clinical and pastoral support to pouch patients. There is a dedicated Pouch Clinic with surgical, gastroenterological and Pouch Nurse on a weekly basis. In total, 260 primary IPAA surgeries have been performed in this unit until September 2019, which accounts to 13 per year. Evidence from the published literature supports improved overall survival and mortality in patients undergoing colorectal surgery in high volume centres and by high-volume surgeons.¹⁰ Pouch excision as a final option for struggling patients is an uncommon procedure and is therefore ideally suited to being managed in a single institution and perhaps, as in our case, by a single surgeon.

Pouch excision is seen, correctly, as high-risk surgery. Our own experience shows an overall complication rate of 31%, with 11% requiring re-intervention of some sort. Although, the number of patients requiring PX surgery is less (<2/year), the team has experience of performing 13 IAPs/year excluding diversion surgery and redo-surgery, which may result in significant benefits in terms of outcomes. Importantly, no patient in our 20-year experience suffered a serious complication or mortality (Clavien-Dindo Grade IV/V). This has led us to believe that if possible, this procedure should be offered in preference to a permanent diverting ileostomy as diversion alone may not remove all the morbidity suffered by the patient leading to their pouch failure. Also, diversion surgery in itself is no less riskier and might necessitate re-laparotomy and lead to high output stoma and consequent intestinal failure.

Crohn's disease has been reported as a major source of pouch failure in several series. Large series in the United States from the Cleveland Clinic and Lahey Clinic have reported Crohn's disease being the cause of pouch failure and excision in 43% and 40% of cases respectively.^{11,12} These are large tertiary centres that receive national and international referrals for complex cases such as these and a higher than expected rate of pouch failure due to Crohn's may be expected as not all pouches will have been originally operated on in these institutions. In the published literature, a post-operative diagnosis of Crohn's disease is relatively uncommon at between 0.7% and 4%.^{13–16} Only 1 patient in our series was proven to have Crohn's disease, although 2 others had

symptoms suggestive of this but final histological analysis of the resected pouch did not find any evidence of the disease.

All patients referred have their original histology slides from the index colectomy re-examined by a Gastrointestinal Pathologist with a view to confirming the diagnosis of ulcerative colitis. In patients with non-typical histology, extra caution is used prior to offering pouch surgery. This approach may have a role in our low rate of failure due to a subsequent diagnosis of Crohn's disease.

This paper has attempted to look at some functional outcomes following PX and we accept that this is a major limitation of this paper due to paucity of data. With the further distal/terminal ileal resection needed, there is concern that patients may lose length affecting their ability to absorb Vitamin B12, or develop higher output ileostomies leading to chronic impairment in renal function and gall stones. Our patients have these indices checked routinely in the Pouch Clinic by our nurse specialist. Another area of functional outcome is sexual function. Re-operation within the pelvis, particularly for septic complications can make nerve-preservation difficult if not impossible. Although, we didn't have data on sexual outcome in this cohort, this is of particular importance to this patient population as they are often young patients for whom such complication would be devastating.

These data demonstrate that pouch failure has two spikes, early and late. We have used 5 years after the index IPAA surgery as the cut-off. We have shown that early excision is strongly associated with sepsis secondary to complications at the index operation. Poor function is also associated with early excision. The histology of these patients in our series is unremarkable indicating this is either due to some technical factor unrecognised at the time of IPAA surgery, or patients in whom the lifestyle with a pouch was not compatible with them.

Our median time to excision in these patients was 13 years. The patients who had late failures requiring excision did so mainly due to a variety of function related conditions. We believe that with our overall pouch excision rate of less than 10%, a median pouch survival of 13 years represents good outcomes and this can be used to inform the patient as part of our discussion of the management options in patients struggling with complications from their IPAA surgery.

Due to the relative paucity of data in this area, we believe that classifying PX into Early (Type 1, <5yrs) and late (Type 2, >5yrs), can allow for standardised reporting and comparisons between series and to help set standards to be achieved in this niche area of surgery.

Conclusion

We have reported the indications and outcomes for ileal pouch excision in a tertiary referral centre on a reasonable number of patients undergoing this uncommon surgery. We have demonstrated that low rates of pouch failure and safe excisional surgery can be achieved by performing this procedure in a specialist unit.

Further work is needed into patient reported outcome measures (PROMS) in areas such as sexual function post-pouch excision and there remains the need for consensus

regarding the classification and reporting of the indications for pouch excision.

Declaration of Competing Interest

The authors declare that they have no conflict of interest.

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