Surgery for inflammatory bowel disease, crossing borders
Gardenbroek, T.J.

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Primary defunctioning of the ileoanal pouch results in poorer long-term functional outcome

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Submitted
ABSTRACT

Background
Protecting the ileal pouch–anal anastomosis (IPAA) with a defunctioning ileostomy is done by most surgeons. However, defunctioning of the IPAA may influence pouch function. This study compared postoperative complications, pouch leakage rates, failure rates, functional outcomes and quality of life and in patients who had an IPAA with or without a defunctioning ileostomy.

Methods
All consecutive patients who underwent IPAA for ulcerative colitis or familial adenomatous polyposis between January 1999 and February 2010 were included. Patients with a primary defunctioning ileostomy after IPAA (IPAA-S group) were compared to patients without a primary defunctioning ileostomy (IPAA-NS group). Demographic data, surgical characteristics and the development of pouch leakage and pouch failure were collected from medical charts. Functional outcome and QoL was assessed prospectively by validated questionnaires.

Results
Seventy-one patients were included in the IPAA-S group and 220 patients in the IPAA-NS group. The IPAA leakage rate was comparable (10.5 vs 7%, P = 0.492), no difference in overall postoperative complications or pouch failure was found. The IPAA-S group scored significantly poorer on incontinence and social impact scores (P < 0.05). Multivariable logistic regression analysis showed that treatment in the IPAA-S group was a predictive factor for protective pad use (OR 2.7, 95% CI 1.086-6.724). Predictive factors for taking constipating medication were treatment in the IPAA-S group (OR 2.28, 95% CI 1.136-4.606) and the occurrence of pouchitis (OR 2.240, 95% CI 1.191-4.916).

Conclusion
Primary defunctioning of an IPAA does not result in a lower leakage rate, overall postoperative complications or decreased pouch failure rates. It results in a higher rate of continence disturbances and impaired social functioning scores at long term follow up compared to patients with an IPAA without primary defunctioning ileostomy. Construction of a defunctioning ileostomy after IPAA should be a patient-tailored decision instead of standard practice.
INTRODUCTION

Ileal pouch–anal anastomosis (IPAA) is the procedure of choice in restorative proctocolectomy (RPC) for patients with ulcerative colitis (UC) and familial adenomatous polyposis (FAP). The J-pouch configuration is most commonly used for IPAA. Alternatives are the S-, W-, and K-pouch configurations. The systematic review published by Lovegrove et al. indicated that the J-pouch is the most optimal configuration. The pouch-anal anastomosis is preferably double stapled to preserve a small rim of rectal mucosa for better continence as opposed to mucosectomy and hand-sewn anastomosis.

After construction of an IPAA, the pouch can be defunctioned by the creation of an ileostomy, thereby adding another stage to the procedure. This primary defunctioning is advocated as standard procedure by most surgical groups to diminish postoperative septic complications that could result in long-term compromise of pouch function. Others choose to defunction selectively to avoid excess short- and long-term morbidity of stoma creation and closure. A meta-analysis suggested that, while the incidence of anastomotic leak (treated surgically or conservatively) was higher when a stoma was omitted, pouch related sepsis and functional outcomes did not differ between the groups. However, a higher incidence of pouch failure was seen in the stoma group. It can be hypothesised that pouch function might be better if the pouch is in function directly after surgery before presacral fixation of the pouch prevents the pouch to mature. The aim of this study was to evaluate pouch leakage rates, long-term pouch failure rates, functional outcomes and quality of life in patients treated with a primary defunctioned pouch compared to patients without primary defunctioning after IPAA.

METHODS

All consecutive patients that underwent RPC and IPAA for UC or FAP from January 1999 to February 2010 were included. The medical charts of these patients were reviewed and demographic data, surgical characteristics, surgical morbidity and the development of pouch failure were collected. Furthermore, functional outcome and general quality of life was assessed prospectively by questionnaires in all patients with a functional pouch in situ for more than one year. The Ethics Committee of the Amsterdam Medical Centre approved this study.

Outcome measures

Surgical outcomes collected were anastomotic leakages, postoperative complications, reoperations, number of ileostomies created, total number of ileostomies, ileostomies
closed, and pouch failure. Furthermore, functional outcomes and quality of life scores were assessed.

Anastomotic leakages were classified according to their management; Grade A: no change in patients’ management, Grade B: leakage requires active therapeutic intervention but is manageable without re-laparotomy/re-laparoscopy, Grade C: leakage requires re-laparotomy/re-laparoscopy. Postoperative complications were defined as any deviation from the normal postoperative course within 30 days after IPAA creation. The number of complications were graded according to the Clavien-Dindo Classification of Surgical Complications. This scale grades complications based on their management. If a patient had more than one complication, only the most severe complication was graded. Reoperations were defined as subsequent surgery due to complications after RPC (owing to anastomotic leakage, abdominal sepsis and fistula) and other surgery (including operations for bowel obstruction, incisional and parastomal herniation). Pouch failure was defined as pouch excision or indefinite proximal diversion.

Patients were classified as having pouchitis if the gastroenterologist or surgeon started antibiotic therapy in the presence of clinical findings and/or endoscopic findings compatible with the diagnosis of pouchitis. Patients were classified in three groups: one episode of pouchitis, multiple episodes, or chronic pouchitis.

Functional results and quality of life data after surgery were analysed using the validated Vaizey, COloRECTal Functional Outcome (COREFO) and Short Form health survey (SF-36) questionnaires. For this purpose, we undertook a postal survey. Patients were sent an invitation to participate in the study, together with information about the study and the questionnaires. Patients who did not respond initially were contacted by telephone to ensure return of the questionnaires.

The Vaizey questionnaire consists of items on type and frequency of incontinence, and on the use of pads or plugs, constipation medication, and the lack of ability to postpone defecation for 15 minutes. The total Vaizey score ranges from 0 (complete continence) to 24 (complete incontinence), with incontinence and social impact subscale scores from 0–12. In the COREFO questionnaire, the functional outcome is assessed in five categories: incontinence, social impact, defecation frequency, stool-related aspects (e.g. pain during bowel movements, blood loss), and use of medication. The five category scores and the total score are transformed to a scale from 0 to 100. A higher score represents an increased level of continence disturbance. The SF-36 includes eight general health dimensions: physical functioning, role limitations due to physical health problems, role limitations due to personal or emotional problems, bodily pain, vitality (energy and fatigue), social functioning, mental health and general health perception. For each dimension, item scores are transformed to a scale from 0 (worst health) to 100 (best health).
Pouch surgery

Colectomy was performed by an open, hand-assisted laparoscopic or total laparoscopic approach. The pouch was created during initial proctocolectomy, or at the time of completion proctectomy in a two-stage procedure. The IPAA was not routinely defunctioned. Creation of a defunctioning ileostomy was at the discretion of the surgeon. An IPAA with defunctioning ileostomy was created in patients regarded to be at risk for anastomotic failure. Important indications were: systemic prednisolone-equivalent corticoid medication of 20 mg/day, severe proctitis, mucosectomy with a handsewn anastomosis, an incomplete ‘doughnut’ after stapling or stapling misfire. Patients developing anastomotic leakage postoperatively were defunctioned immediately if not done so primarily, thereby adding one stage to the procedure for closure. The surgical technique of IPAA creation and anastomosis has been described previously\textsuperscript{19}. In summary, the rectum was removed according to the total mesorectal or close rectal dissection technique preceded by colectomy. Subsequently, the pouch was created with either a single TLC-75 mm or TLC-100 mm stapler cartridge (Ethicon Endo-Surgery, Inc., Cincinnati, OH). When a TLC-75 was used the efferent loop was reanastomosed with the afferent loop creating a 10 cm B shaped reservoir. The B shaped reservoir was done in the time period that the TLC-100 was not available yet. The ileo-anal anastomosis was performed either using a 29 mm circular stapler or hand-sewn using interrupted sutures in case of anal mucosecomy.

Statistical analysis

Patients with a primary defunctioning ileostomy after IPAA were included in the IPAA-S group, patients without a primary defunctioning ileostomy after IPAA were included in the IPAA-NS group. Outcomes were compared based on an ‘intention-to-treat’ analysis. Therefore, in patients where an ileostomy was created due to post-operative complications (e.g. in case of anastomotic leakage) were included in the IPAA-NS group. To evaluate the effect of pouch leakage on pouch function, the functional outcomes and quality of life of patients with an anastomotic leak were included in the IPAA-C group for separate analysis.

Descriptive data are reported as median with inter quartile range (iqr). Categorical data were analysed with Fisher’s exact test or $\chi^2$ test. Continuous variables were analysed using the Mann-Whitney-Wilcoxon test. Outcomes of the long-term functional outcome and quality of life questionnaires were analysed accordingly or with t-test depending in distribution after linear transformation. Multivariable logistic regression was used to determine possible factors prognostic for pad use. In this regression the indication for surgery, preoperative steroid use, anastomosis type, treatment (IPAA-S or IPAA-NS), pouch leakage, and the occurrence of pouchitis (one/multiple episodes or chronic) were included. Results are shown as odds ratio’s (OR) and 95%-confidence intervals (CI). $P < 0.05$
was considered statistically significant. IBM SPSS Statistics for Windows®, version 19.0. (IBM Corp., Armonk, NY, United States) was used for statistical analysis.

RESULTS

A total of 291 patients were identified. Figure 1 shows the study profile. In 71 patients the IPAA was created with a defunctioning ileostomy (IPAA-S group), in 220 patients the IPAA was created without defunctioning ileostomy (IPAA-NS group). The sex, age and body mass index both patient groups were not significantly different. In the IPAA-S group 91.5% of the patients were diagnosed with UC or IBD-unknown, compared to IPAA-NS group 72.8% (\(P = 0.003\), Table 1).

![Figure 1 Study profile](image-url)

<table>
<thead>
<tr>
<th>Study group</th>
<th>n = 291</th>
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<tr>
<td>IPAA with stoma (IPAA-S)</td>
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</tr>
<tr>
<td>n = 71</td>
<td></td>
</tr>
<tr>
<td>IPAA without stoma (IPAA-NS)</td>
<td></td>
</tr>
<tr>
<td>n = 220</td>
<td></td>
</tr>
<tr>
<td>- Questionnaire not applicable n = 34</td>
<td></td>
</tr>
<tr>
<td>- Did not return questionnaire n = 37</td>
<td></td>
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<tr>
<td>Returned questionnaire</td>
<td>n = 55</td>
</tr>
<tr>
<td>Returned questionnaire</td>
<td>n = 165</td>
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Table 1 Patient characteristics

<table>
<thead>
<tr>
<th></th>
<th>IPAA-S n = 71</th>
<th>IPAA-NS n = 220</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex (M)</td>
<td>43 (60.6)</td>
<td>109 (49.5)</td>
<td>0.133*</td>
</tr>
<tr>
<td>Age at surgery (years)</td>
<td>40 ± 12.3</td>
<td>37 ± 12.8</td>
<td>0.053†</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>24.8 ± 4.9</td>
<td>24.1 ± 4</td>
<td>0.481†</td>
</tr>
<tr>
<td>Diagnosis</td>
<td></td>
<td></td>
<td>0.003§</td>
</tr>
<tr>
<td>UC</td>
<td>62 (87.3)</td>
<td>148 (67.3)</td>
<td></td>
</tr>
<tr>
<td>FAP</td>
<td>6 (8.5)</td>
<td>60 (27.3)</td>
<td></td>
</tr>
<tr>
<td>IBDU</td>
<td>3 (4.2)</td>
<td>12 (5.5)</td>
<td></td>
</tr>
<tr>
<td>Indication for surgery</td>
<td></td>
<td></td>
<td>&lt;0.000⁶</td>
</tr>
<tr>
<td>Refractory UC</td>
<td>62 (87.3)</td>
<td>138 (62.7)</td>
<td></td>
</tr>
<tr>
<td>Dysplasia / carcinoma</td>
<td>6 (8.5)</td>
<td>39 (17.7)</td>
<td></td>
</tr>
<tr>
<td>Preventive</td>
<td>3 (4.2)</td>
<td>43 (19.5)</td>
<td></td>
</tr>
</tbody>
</table>
Surgical outcomes

Twenty-eight of 291 patients (9.6%) developed an anastomotic leakage; five patients in the IPAA-S (7%) and 23 patients (10.5%) in the IPAA-NS group (Table 2, P = 0.492). These were Grade B leakages in 1 patient in both groups and Grade C leakages in 4 vs 22 patients, respectively. A reoperation for other reasons than anastomotic leakage within 30 days was performed in 6 (8.5%) patients in the IPAA-S compared to 8 (3.6%) patients in the IPAA-NS (P = 0.114).

Overall complications graded according to the Clavien-Dindo classification did not differ between groups (Table 3, P = 0.172), although there were more Grade II complications in the IPAA-S group (P = 0.011). There were no perioperative mortalities.

In the IPAA-S group the ileostomy was reversed after a median of 3 months (iqr 2-4). In the 28 patients with an anastomotic leak, the ileostomy was reversed after a median of 6.5 months (iqr 3.8-13).

There was no difference in the prevalence of one or more episodes of pouchitis or chronic pouchitis between both groups (P > 0.05). Pouch failure occurred in 6 patients (8.5%) in the IPAA-S group versus 14 patients (6.4%) in the IPAA-NS group. Indefinite proximal diversion was done in 4 patients (5.6%) versus 6 patients (2.7%), pouch excision had to be performed in 2 (2.8%) versus 8 (3.6%) patients, respectively (P > 0.5).
Table 2 Surgical characteristics

<table>
<thead>
<tr>
<th></th>
<th>IPAA-S n = 71</th>
<th>IPAA-NS n = 220</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anastomotic leakage</td>
<td>5 (7)</td>
<td>23 (10.5)</td>
<td>&gt;0.05⁹</td>
</tr>
<tr>
<td>Grade A</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Grade B</td>
<td>1 (1.4)</td>
<td>1 (0.5)</td>
<td></td>
</tr>
<tr>
<td>Grade C</td>
<td>4 (5.6)</td>
<td>22 (10)</td>
<td></td>
</tr>
<tr>
<td>Reoperation due to complications†</td>
<td>6 (8.5)</td>
<td>8 (3.6)</td>
<td>0.114⁴</td>
</tr>
<tr>
<td>RPC related laparotomy</td>
<td>2 (2.8)</td>
<td>3 (1.4)</td>
<td></td>
</tr>
<tr>
<td>Other surgery</td>
<td>4 (5.6)</td>
<td>5 (2.5)</td>
<td></td>
</tr>
<tr>
<td>Total number of secondary ileostomies created‡</td>
<td>-</td>
<td>31 (14.1)</td>
<td></td>
</tr>
<tr>
<td>Pouchitis</td>
<td></td>
<td></td>
<td>&gt;0.05⁹</td>
</tr>
<tr>
<td>One episode</td>
<td>7 (9.9)</td>
<td>14 (6.4)</td>
<td></td>
</tr>
<tr>
<td>Multiple episodes</td>
<td>1 (1.4)</td>
<td>3 (1.4)</td>
<td></td>
</tr>
<tr>
<td>Chronic pouchitis</td>
<td>17 (23.9)</td>
<td>30 (13.6)</td>
<td></td>
</tr>
<tr>
<td>Long term pouch failure</td>
<td>4 (5.6)</td>
<td>6 (2.7)</td>
<td>0.265⁵</td>
</tr>
<tr>
<td>Indefinite proximal diversion</td>
<td>2 (2.8)</td>
<td>8 (3.6)</td>
<td>1.000⁵</td>
</tr>
<tr>
<td>Pouch excision</td>
<td></td>
<td></td>
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<td></td>
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</tbody>
</table>

Data are presented as median [IQR] or n (%). ¹Chi-square test / ²Fisher’s exact test (two-tailed)
Anastomotic leakages were classified as Grade A: no change in patient’s management, Grade B: leakage requires active therapeutic intervention but is manageable without re-laparotomy/re-laparoscopy, Grade C: leakage requires re-laparotomy/re-laparoscopy
†RPC related reasons for reoperation within 30 days (other than anastomotic leakage) in the IPAA-S group were; abscess drainage (n = 2), in the IPAA-NS group these were; abscess drainage (n = 1), luxation of pouch drain through pouch (n = 1), pouch-vaginal fistula (n = 1). Other reasons for reoperation in the IPAA-S group were correction of ileostomy (n = 3), adhaesiolysis (n = 1), in the IPAA-NS group these were adhaesiolysis (n = 2) fascia dehiscence (n = 1), pouch retention (n = 1) luxation of small bowel through omentum majus (n = 1).
‡Ileostomy created at any time after IPAA creation due to pouch leakage (n = 23), abscess drainage (n = 2), adhaesiolysis (n = 1), pouch retention (n = 1), luxation of pouch drain through pouch (n = 1), pouch-vaginal fistula (n = 2), high defecation frequency (n = 1).

Functional outcomes

In 34 of 291 patients the questionnaires were not applicable; 20 patients (6.9%) had either pouch excision or indefinite proximal diversion and 14 patients (4.8%) died in the period between pouch procedure and the questionnaires (Figure 1). Of the 257 patients, 220 patients (86%) returned the questionnaires; 55 patients in the IPAA-S group and 165 patients in the IPAA-NS group. The response rate did not differ between the two groups (P = 0.725). Median follow up period (time between construction of the IPAA and returning the questionnaires) for the entire study population was 68 months (iqr 39-101).

The social impact subscore of the Vaizey score (Figure 2) was significantly higher in the IPAA-S group compared to the IPAA-NS group (P = 0.045), indicating more disturbance. The outcomes of the COREFO questionnaire are shown in Figure 3. The IPAA-S group had a significantly poorer score on the incontinence subscore (P = 0.011) and the medication subscore (P = 0.010) compared to the IPAA-NS group.
Table 3 Complications within 30 days graded according to Clavien-Dindo classification

<table>
<thead>
<tr>
<th>Clavien-Dindo classification</th>
<th>IPAA-S n = 71</th>
<th>IPAA-NS n = 220</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade I</td>
<td>5 (7.0)</td>
<td>8 (3.6)</td>
<td></td>
</tr>
<tr>
<td>Grade II</td>
<td>7 (9.9)</td>
<td>5 (2.3)</td>
<td>0.011</td>
</tr>
<tr>
<td>Grade IIIa</td>
<td>7 (9.9)</td>
<td>15 (6.8)</td>
<td></td>
</tr>
<tr>
<td>Grade IIib</td>
<td>7 (9.9)</td>
<td>29 (13.2)</td>
<td></td>
</tr>
<tr>
<td>Grade IV</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Grade V</td>
<td>0</td>
<td>0</td>
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</tbody>
</table>

**Grade I:** Any deviation from the normal postoperative course without the need for treatment. Allowed therapeutic regimens are: drugs as anti-emetics, antipyretics, analgesics, diuretics, electrolytes and physiotherapy

**Grade II:** Requiring pharmacological treatment with drugs other than such allowed for grade I complications. Included are blood-transfusion and total parenteral nutrition

**Grade IIIa:** Requiring surgical, endoscopic or radiological intervention without general anaesthesia

**Grade IIIb:** Requiring surgical, endoscopic or radiological intervention with general anaesthesia

**Grade IV:** Life-threatening complication requiring IC/ICU management

**Grade V:** Death of a patient

No difference in overall complications between groups was found, P = 0.172. A significant difference in complications Grade II between IPAA-S and IPAA-NS groups was found, P = 0.011). For all other complications P >0.05.

Figure 2 Vaizey scores

The total Vaizey score ranges from 0 (complete continence) to 24 (complete incontinence), with incontinence and social impact subscale scores from 0–12

IPAA-NS: patients without a primary defunctioning ileostomy after IPAA. IPAA-S: patients with a primary defunctioning ileostomy after IPAA. * = significant difference P < 0.05.
No correlation between time to ileostomy reversal and better Vaizey or COREFO scores could be demonstrated.

In the IPAA-S group 13 patients (23.6%) used protective pads, compared to 17 patients (10.3%) in the IPAA-NS group (P = 0.021). For patients in the IPAA-S group, the OR for protective pad use was 2.69 (95% CI 1.10-6.41) compared to patients in the IPAA-NS group.

Constipating medication was taken by 34 patients (61.8%) in the IPAA-S group versus 60 patients (36.6%) in the IPAA-NS group (P = 0.002). For patients in the IPAA-S group, the OR for taking constipating medication was 2.81 (95% CI 1.43-5.56) compared to patients in the IPAA-NS group. No differences in daily or nightly stool frequency between the study groups were found.

Multivariable logistic regression analysis showed that treatment in the IPAA-S group was a predictive factor for protective pad use (OR 2.7, 95% CI 1.08-6.72). Predictive factors for taking constipating medication were treatment in the IPAA-S group (OR 2.28, 95% CI 1.13-4.60) and the occurrence of pouchitis (OR 2.24, 95% CI 1.19-4.92).

Quality of life
The groups did not differ in the eight general health dimensions of the SF-36 (P > 0.05). Vitality (energy and fatigue) and general health perception were scored the lowest compared to other dimensions in both groups (Figure 4).

Figure 3 COREFO score
COREFO score: a higher score represents an increased level of continence disturbance. IPAA-NS: patients without a primary defunctioning ileostomy after IPAA. IPAA-S: patients with a primary defunctioning ileostomy after IPAA. * = significant difference P < 0.05.
The functional outcomes of patients in the IPAA-C were separately analysed and compared with patients without anastomotic leakage in the IPAA-S group. The IPAA-C group had a significantly worse score on the CORFEO frequency subscale, for all other COREFO subscales and the Vaizey scores no significant differences were found. The number of patients using protective pads in the IPAA-C group was 10.5%. The number of patients taking constipating medication in the IPAA-C group was 44.4%. Furthermore, no differences in the SF-36 scores between the groups were found.

DISCUSSION

This study shows that primary defunctioning of an IPAA does not result in a lower leakage rate, overall postoperative complications or decreased pouch failure rates. It results in a higher rate of continence disturbances, indicated by more protective pad use, increased use of constipating medication, and impaired social functioning scores at long term follow up compared to patients with an IPAA without primary defunctioning ileostomy.

For this study, the functional outcomes and quality of life after anastomotic leakage were assessed by validated questionnaires (Vaizey, COREFO and SF 36). Only patients in whom the pouch was functional for at least one year were included, as it is generally accepted that pouch function does not evolve any longer after one year. It is known that health related quality of life and health status improves in 12 months’ time after restorative proctocolectomy.
and becomes indistinguishable from the normal healthy population. In our hospital, a pouch of approximately 10 cm is created. This is smaller than the J-pouches often created in other centres, which have a length of approximately 15 cm. The smaller pouches created in our centre have similar quality of life and continence outcomes compared to the larger pouches. Furthermore, almost all patients (92.8%) in our hospital undergo stapled anastomosis. This is suggested to be associated with a decrease risk on complications associated with omission of diversion.

The results of this study corroborate with the findings of earlier clinical studies that showed that omission of defunctioning ileostomy after IPAA in selected patients does not increase septic complication and pouch failure rates. Patients with an ileostomy due to postoperative complications after IPAA are expected to have deteriorated function compared to IPAA patients with a primary defunctioning ileostomy, although the metanalysis by Weston-Petrides suggested that functional outcomes are equal in both groups. This study confirms these findings, as the functional outcomes between patients with an anastomotic leak (IPAA-C) were comparable to patients with a primary defunctioning ileostomy without complications.

A possible explanation for the poorer functional outcomes in patients with a defunctioning ileostomy after IPAA compared to patients without defunctioning ileostomy can be the potential deterioration of anal sphincter function after (long-term) faecal deviation. Furthermore, it can be hypothesised that a defunctioned IPAA will be hampered in maturation due to fixation in the presacral space and will be more non-compliant compared to non-defunctioned IPAA’s. Finally, it has been demonstrated that anastomotic strictures at the level of the pouch-anal anastomosis are more frequent in patients with a defunctioning ileostomy. This can potentially contribute to worse functional outcomes.

The strength of this study is the use of different questionnaires and the long follow-up period in both patient groups. This study was a non-randomised, single centre study from a tertiary referral centre in the Netherlands, and has therefore potential biases that could influence the results. The largest drawback is the fact that the creation of a defunctioning ileostomy was at the discretion of the surgeon. It could be hypothesized that this group therefore represents patients more at risk of leakage (and therefore worse outcome). However, the 7% leakage rate found in this group compares favourably to the literature and the functional results of patients after anastomotic complications was not significantly different from the IPAA-S group. This study is furthermore limited by the partially retrospective design. Although it is known that the risk on pouchitis increases over time and could therefore still be underestimated in both groups, it is unlikely that with longer FU, significant differences will develop in both groups that could influence functional outcomes.

This study shows that defunctioning of the pouch will not prevent pouch leakage, overall postoperative complications and failure rates. Furthermore, primary defunctioning of
the IPAA is associated with disturbances in continence. Moreover, functional outcomes and quality of life of IPAA patients with anastomotic complications are comparable to IPAA patients with a primary defunctioning ileostomy. Therefore, we believe that creation of a protective ileostomy in all patients as standard procedure should be avoided. This will also prevent a standard subsequent hospitalisation with a surgical procedure for ileostomy closure which is known to be associated with clinically relevant morbidity. Furthermore, the omission of an ileostomy after IPAA may offer cost savings. However, a protective ileostomy will be needed in a selected group of patients with anticipated anastomotic complications. To accurately select patients at risk for pouch failure, a prognostic model of preoperative risk factors will be needed.

Primary defunctioning of the IPAA resulted in a higher rate of continence disturbances and impaired social functioning scores at long term follow up compared to patients with an IPAA without primary defunctioning ileostomy. We believe that construction of a defunctioning ileostomy in all patients as standard procedure should therefore be avoided; this must be a patient-tailored decision.
REFERENCES


17 Vaizey CJ, Carapeti E, Cahill JA, Kamm MA. Prospective comparison of faecal inconti-


