Results and complications after ileal pouch anal anastomosis: a meta-analysis of 43 observational studies comprising 9,317 patients
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CRD summary
This review assessed complications and functional outcomes after ileal pouch anal anastomosis. The authors concluded that the complication rates with current surgical techniques are significant and there is room for improvement. The review supports the authors' conclusions, but the reliability of the evidence is weakened by the limited search and the use of observational data with no comparison groups.

Authors' objectives
To assess complications and functional outcomes after ileal pouch anal anastomosis (IPAA).

Searching
MEDLINE was searched from 1978 using the terms reported. The reference lists of relevant papers were checked. Studies not reported in English were only included if there was an English abstract.

Study selection
Study designs of evaluations included in the review
Studies that evaluated at least 50 patients and provided details of their baseline characteristics were eligible for inclusion. The duration of follow-up, where reported, ranged from 12 to 99 months (median 36.7).

Specific interventions included in the review
Studies of IPAA were eligible for inclusion. The majority of the included studies used a diverting ileostomy (82% of patients, range: 0 to 100), and most of the anastomoses were handsewn (62%) or a double-stapled anastomosis was constructed (38%).

Participants included in the review
Studies of patients having reconstructive surgery were included. The majority of the included studies evaluated patients with ulcerative colitis (88%); others evaluated those with indeterminate colitis, Crohn's disease, familial adenomatous polyposis and other diagnoses.

Outcomes assessed in the review
Studies that reported pouch failure or pelvic sepsis were eligible for inclusion. The review also assessed other complications (including pouch-related anal or vaginal fistula, stricture, sexual dysfunction and small bowel obstruction) and functional outcomes (mild, severe and urge faecal defecation). The reviewers used the definitions for continence that were provided in the primary studies and reported definitions used in the review for other outcomes.

How were decisions on the relevance of primary studies made?
Two reviewers selected studies for inclusion and eligibility was reassessed after the initial data extraction.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
Two reviewers independently extracted the data, and any disagreements were resolved by consensus by jointly reviewing the study. Data were extracted on the incidence rates for each complication and on the defecation frequency.
Data on related complications were counted only once for the most serious complication of that type.

**Methods of synthesis**

How were the studies combined?
The results from the individual studies were transformed and combined using a random-effects meta-analysis. Pooled estimates of the incidence rate with 95% confidence intervals (CIs) were calculated for each complication. The pooled defecation frequency was also calculated.

How were differences between studies investigated?
Scatter plots were used to examine the relationship between the incidence rates of the main complications and the year of publication, sample size, duration of follow-up, surgical technique and use of a diverting ileostomy.

**Results of the review**

Forty-three studies (n=9,317) were included: 31 retrospective and 21 prospective observation studies.

Pouch-related complications.

The pooled incidence of pouch failure was 6.8% (95% CI: 5.4, 8.4; based on 8,877 patients in 39 studies) rising to 8.5% (95% CI: 5.4, 13.2; based on 3,198 patients in 11 studies) after more than 5 years' follow-up.

The pooled incidence of pelvic sepsis was 9.5% (95% CI: 8.2, 10.9; based on 9,082 patients in 41 studies), fistula 5.5% (95% CI: 4.3, 7.0; based on 5,120 patients in 30 studies), stricture 9.2% (95% CI: 6.8, 12.4; based on 5,185 patients in 28 studies), sexual dysfunction 3.6% (95% CI: 2.7, 4.7; based on 5,112 patients in 21 studies) and pouchitis 18.8% (95% CI: 15.7, 22.4; based on 7,289 patients in 33 studies).

The most common non-pouch related complication was small bowel obstruction, with a pooled incidence of 13.1% (95% CI: 11.0, 15.7; based on 5,835 patients in 27 studies).

Function (36 studies, n=5,215).

The pooled incidence of severe daytime faecal incontinence was 3.7% (95% CI: 2.8, 2.8; based on 3,914 patients in 27 studies), mild daytime faecal incontinence 17% (95% CI: 12.8, 22.2; based on 4,313 patients in 31 studies) and urge incontinence 7.3% (95% CI: 4.5, 11.6; based on 2,165 patients in 16 studies).

The pooled incidence of night-time faecal incontinence was 13.1% (95% CI: 9.5, 17.9; based on 2,582 patients in 17 studies) for mild incontinence and 4.5% (95% CI: 3.0, 11.6; based on 1,271 patients in 9 studies) for severe incontinence.

The mean defecation frequency was 5.2 per 24 hours (95% CI: 4.4, 6.1; based 3,547 patients in 30 studies) with a night-time frequency of 1.0 (95% CI: 0.6, 1.6; based on 2,950 patients in 20 studies).

Overall, the results of pouch failure and pelvic sepsis were not affected by year of publication, duration of follow-up, sample size, surgical technique and use of a diverting ileostomy.

**Authors' conclusions**

Current techniques used for restorative surgery are associated with significant complications and there is room for improvement.

**CRD commentary**

The review addressed a clear question defined in terms of the intervention, participants and outcomes. Given the likely paucity of controlled studies and the nature of the intervention, the lack of specified inclusion criteria for study design appeared appropriate. Limiting the search to one electronic database and reference lists of identified studies might have
resulted in the omission of other relevant studies and raised the possibility of publication bias; a possibility that the authors acknowledged. Two reviewers selected studies but it was unclear if this was performed independently; thus the potential for reviewer bias and error cannot be adequately assessed. Methods were used to minimise errors and bias in the extraction of data. Validity was not assessed but the authors discussed the possible sources of bias inherent with the types of studies included.

In the graphs presented, the incidence rates of complications appeared to vary considerably between studies. Although the authors used a random-effects model to combine the studies, statistical heterogeneity was not formally assessed; thus it was difficult to assess whether combining the studies statistically was appropriate. However, differences between the studies were examined by exploring the influence of various factors on incidence rates. In their discussion, the authors correctly advised that the reported estimates of complication rates may not be reliable. The review supports the authors’ conclusions about there being significant rates of complications, but the evidence is weakened by the inclusion of mainly retrospective observational data with no comparison group. In addition, the search was limited to one electronic database so relevant studies might not have been identified.

**Implications of the review for practice and research**
The authors did not state any implications for practice or further research.

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