Pouch-anal anastomosis vs straight ileoanal anastomosis in pediatric patients: a meta-analysis

CRD summary
This review compared two methods of reconstructive surgery for children undergoing proctocolectomy. The authors concluded that pouch-anal anastomosis seems to be superior to straight ileoanal anastomosis, but that the results should be treated with caution given the lack of good-quality studies. This conclusion reflects the limitations of the evidence presented and seems appropriate.

Authors' objectives
To compare the risks and benefits of pouch-anal anastomosis (IPAA) and straight ileoanal anastomosis (SIAA) in children undergoing restorative proctocolectomy.

Searching
MEDLINE and EMBASE were searched for studies published between 1980 and June 2005; the search terms were reported. The 'Related Articles' function in the databases was used to identify additional articles.

Study selection
Studies of children or adolescents undergoing restorative proctocolectomy that compared IPAA and SIAA were eligible for the review. Studies were required to report at least one from a list of outcomes including failure of reconstruction (primary outcome for the review), long- and short-term adverse outcomes, and functional outcomes. Studies that displayed a zero for outcomes of interest in both groups were excluded. The participants in the included studies underwent surgery for ulcerative colitis or familial adenomatous polyposis coli, and over 70% received an IPAA. The mean age of participants in the included studies ranged from 13 to 22 years; two studies appeared to include adult participants.

The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
Validity was assessed using a modification of the Newcastle-Ottawa scale. Patient selection, comparability of the groups and outcome assessment were evaluated and a validity score assigned to each study, although details of how the scores were calculated were not provided. The authors did not state how the validity assessment was performed.

Data extraction
For dichotomous outcomes, data on the numbers with the outcome in each group were used to calculate the odds ratio (OR) and associated 95% confidence interval (CI) for each study. For continuous outcomes, means and standard deviations were used to derive the weighted mean difference between groups. Two reviewers independently extracted the data.

Methods of synthesis
The studies were combined by meta-analysis, using both fixed-effect and random-effects models; mainly random-effects results were reported. Funnel plots were used to assess the risk of publication bias. Statistical heterogeneity was assessed using the $\chi^2$ and $I^2$ statistics. Subgroup and sensitivity analyses were undertaken to assess the effects of study size, study quality and mean participant age.

Results of the review
Five retrospective case series (306 patients, of whom 86 underwent SIAA and 220 IPAA) were included in the review. Quality scores ranged from 1 to 5.
There were statistically significant differences between the groups for reconstruction failure (OR 3.21, 95% CI: 1.24, 8.34), abdominal salvage (OR 9.50, 95% CI: 3.14, 28.77) and perianal sepsis (OR 2.36, 95% CI: 1.01, 5.53), all of which favoured the IPAA group (based on three or four studies). Anastomotic stricture, inflammation of neorectum/ileal pouch, entero-vaginal fistula, anastomotic leak and small bowel obstruction did not differ significantly between the groups. Statistically significant heterogeneity was not found for any outcome, although $I^2$ was greater than 50% for anastomotic stricture and inflammation of the neorectum/ileal pouch. Functional outcomes favoured IPAA (based on one or two studies). Statistical significance was not found for abdominal salvage or perianal sepsis in subgroup analyses of studies with a mean age below 18 years and of studies scoring 3 or more for quality. Funnel plots (presented for one outcome) did not show evidence of publication bias.

Authors’ conclusions
IPAA seems to be superior to SIAA in terms of reconstruction survival and functional outcomes, but the results should be treated with caution in view of the lack of good-quality studies.

CRD commentary
This review had clear inclusion criteria for the participants, interventions and outcomes and broad criteria for the study design. Some studies that included adult patients were included in the review, which could affect the generalisability of the results; the impact of this was explored in a subgroup analysis. The search was relatively narrow, which means that relevant studies could have been missed. Unpublished studies were not sought and it is unclear whether language restrictions were imposed. The risk of publication bias was assessed using funnel plots, although this method was unlikely to give useful results in view of the small number of included studies. Validity was assessed, but the methods used for scoring validity were not reported. The results of the validity assessment were used in the analysis. Appropriate methods were used to minimise errors and bias in the data extraction; methods used for the study selection and validity assessment processes were not reported. Relevant details of the included studies were presented. The studies were combined by meta-analysis and heterogeneity among the studies was explored. All of the included studies were retrospective case series and hence at risk of bias, and there was an imbalance in group sizes in the meta-analysis. In view of these limitations, the authors’ conclusion that the results of the meta-analysis should be treated with caution seems appropriate.

Implications of the review for practice and research
Practice: The authors stated that restorative proctocolectomy with IPAA formation should be the treatment of choice for children with ulcerative colitis or familial adenomatous polyposis coli.

Research: The authors stated that IPAA should be evaluated as a definitive operation for children with total colonic aganglionosis.

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