Colon and rectal anastomoses do not require routine drainage: a systematic review and meta-analysis

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Authors' objectives
To determine if placement of a drain after a colonic or rectal anastomosis can reduce the rate of complications.

Searching
A search was conducted of MEDLINE (1987 - 1997) for English language publications using the following terms: 'colon'; 'postoperative complications'; 'surgical anastomosis'; and 'drainage'. Appropriate citations were reviewed. A content expert was consulted and a manual search made of bibliographies of relevant papers. Reasons were given for exclusion of identified studies.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) that compared the prophylactic use of a drain for a colonic or rectal anastomosis to a control group of patient who did not receive a drain were included.

Specific interventions included in the review
Use of the following types of drain were studied: corrugated latex; corrugated silastic; and closed suction. Drains remained in place for periods up to 7 days.

Participants included in the review
Participants had intra peritoneal colonic anastomosis or pelvic anastomosis with rectal or anal anastomosis accounting for 48% of subjects anastomosis. Characteristics of subjects included the following (where reported); cancer indication rates from 56% to 73%; stapled anastomosis rates from 11% to 27%; and emergency operation rates from 0% to 21%.

Outcomes assessed in the review
The following outcomes were assessed: mortality; clinical anastomotic leak; radiological leak; wound infection; and respiratory complications. Definitions of outcomes were accepted as reported.

How were decisions on the relevance of primary studies made?
The authors do not state how the papers were selected for the review, or how many of the authors performed the selection.

Assessment of study quality
Studies were evaluated using the criteria proposed by Detsky et al (see Other Publications of Related Interest) Trial validity was evaluated independently by two reviewers and graded on an ordinal 22 point scale with higher scores representing studies of higher quality. Discrepancies were resolved by consensus.

Data extraction
Data were extracted independently by two reviewers with discrepancies being resolved by consensus.

Methods of synthesis
How were the studies combined?
A pooled odds ratio (OR) and 95% confidence interval was estimated for all outcomes using the fixed-effect model of Yusuf et al and Mantel Haenszel.
How were differences between studies investigated?
Homogeneity was assessed using the chi-squared test of heterogeneity. Sensitivity analyses were performed by omitting trials of lower quality, trials that included < 50% rectal or anal anastomosis, and trials not using closed suction drains.

Results of the review
Four RCTs were included (414 patients).

Agreement on data extraction was 100% between reviewers. Agreement on critical appraisal was high (weighted kappa = 0.96).

Quality of studies was poor (mean quality score 14 on a 22 point scale). Methodological flaws included inadequate randomisation and non-blinding and subjective assessment of outcomes.

None of the pooled OR (drained group vs not-drained) were statistically significant. The test of heterogeneity for each outcome revealed no significant differences between the studies.

Mortality (411 patients): OR = 1.4 (95% CI: 0.6, 3.3).
Clinical leak (411 patients): OR = 1.5 (95% CI: 0.7, 3.1).
Radiological leak (3 RCTs, 305 patients): OR = 1.0 (95% CI: 0.5, 2.3).
Wound infection (411 patients): OR = 1.7 (95% CI: 0.9, 3.3).
Respiratory complications (411 patients): OR = 0.8 (95% CI: 0.4, 1.6).

Sensitivity analyses, performed by omitting trials of lower quality, trials that included < 50% rectal or anal anastomosis, and trials not using closed suction drains did not favour the treatment group with 95% confidence.

Of 20 drains present at the time of anastomotic leak, only 1 drained pus or enteric content.

Authors' conclusions
Prophylactic drainage of colon and rectal anastomosis is not a useful practice and should be abandoned. Additional well-designed randomised controlled trials would further reinforce this conclusion.

CRD commentary
The aims and inclusion criteria were clearly stated. Methods used to extract data and evaluate validity were described. Statistical heterogeneity was assessed. The discussion includes consideration of the limitations in the primary studies including failure to consistently report data in a manner that allowed selective extraction of results for rectal anastomosis and inadequate documentation of inclusion criteria, randomisation, and full treatment regime. Sources of potential clinical heterogeneity between studies and publication bias were also considered.

By limiting the literature search to published English language studies, some other relevant studies may have been omitted. Fuller details of the primary studies (including adverse reactions to placement of drains) and of the validity criteria would have been helpful.

The authors conclusions were supported by the evidence presented.

Implications of the review for practice and research
Practice: The authors conclude that prophylactic drainage of colon and rectal anastomosis is not a useful practice and should be abandoned.
Research: The authors consider that additional large, well-designed controlled trials focusing on draining pelvic anastomosis would provide further support for the conclusions of this review.

Bibliographic details

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Other publications of related interest

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Subject indexing assigned by NLM

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.