

A strategy of evaluation and delayed closure of dirty abdominal wounds reduced wound infections

Cohn SM, Giannotti G, Ong AW *et al*. *Prospective randomized trial of two wound management strategies for dirty abdominal wounds*. *Ann Surg* 2001 Mar;233:409–13.

QUESTION: Does a strategy of evaluation and delayed primary closure (E/DPC) of dirty abdominal wounds decrease wound infection compared with primary closure (PC)?

Design

Randomised [allocation concealed]*, unblinded, controlled trial with follow up at ≥ 1 month.

Setting

A university hospital and a trauma centre in Miami, Florida, USA.

Patients

51 patients ≥ 18 years of age who were admitted to the trauma/emergency surgery or colorectal services and had dirty abdominal wounds at the time of surgery. Dirty abdominal wounds were defined as involving pre-existing clinical infection, perforated viscera, or traumatic wounds with viscus injury more than 4 hours from the time of injury with retained devitalised tissue. 96% of patients (mean age 46 y, 76% men) were included in the final analysis.

Intervention

Allocation was stratified by type of wound (appendectomy and other abdominal wounds). 26 patients were allocated to E/DPC for appropriate wounds. Wounds were packed with saline soaked gauze and were not manipulated until postoperative day 3, at which time the dressing was changed using sterile technique and the wound was assessed. If the wound showed no drainage, it was approximated the next day with adhesive strips; otherwise it was left open and dressings were changed twice daily. If a wound infection was suspected before postoperative day 3, the dressing was removed, the wound was assessed, and the dressing was repacked using sterile technique. 25 patients were allocated to PC, whereby wounds were closed with skin staples and subcutaneous tissues were not approximated.

Main outcome measure

Wound infection (observed purulent drainage).

Main results

14 patients in the E/DPC group had delayed closure, with 1 wound infection and 2 possible wound infections. 12 wounds were judged to be unsuitable for closure at postoperative day 3 and dressing changes were initiated per protocol. Fewer patients in the E/DPC group had wound infections compared with patients in the PC group (table)

Conclusion

Among patients with dirty abdominal wounds, a strategy of evaluation and delayed primary closure reduced wound infections compared with a strategy of primary closure.

*Information provided by author.

COMMENTARY

Although PC has been advocated to reduce costs,¹ delayed primary closure (DPC) of wounds when infection seems probable is common practice. Several small trials, however, have reported no difference in infection rates between PC and DPC for appendicitis. Cohn *et al*, in a pragmatic approximation of clinical reality, evaluate the effect of E/DPC at 3 days after surgery in various dirty abdominal wounds, and report a significant reduction in wound infection rates in this interim analysis.

The difference in findings among trials may be explained by the use of different methodologies, such as the use of systemic antibiotic prophylaxis. Antibiotic prophylaxis is known at worst to reduce the risk of infection by one half in colorectal surgery.² Unfortunately, Cohn *et al* did not compare the rates of all type antibiotic use between treatment and control groups. Given the efficacy of antibiotic prophylaxis, it would be useful to include this prognostic factor in the final report to establish baseline equivalence.

A further limitation acknowledged by the authors is the absence of blinding, particularly of the outcome assessor. Coupled with the short duration of follow up for those wounds healing by secondary intention (ie, at 1 mo, not to complete healing), the absence of blinding could threaten the validity of the findings. Inadequate blinding tends to increase the estimated magnitude of treatment effect.³

Cohn *et al* present new information on the effect of E/DPC on postoperative infection. The final report may prove useful as nurses need to appreciate the surgical strategy of E/DPC, with the alternate possibility of healing by secondary intention, in order to support patients' own understanding. The strategy of DPC may also be ripe for a systematic review of trials.

Andrew Jull, RN, MA
Clinical Nurse Consultant
Auckland Hospital
Auckland, New Zealand

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For correspondence:
Dr S M Cohn, Divisions
of Trauma and Surgical
Critical Care,
Department of Surgery,
University of Miami
School of Medicine,
Miami, FL 33136, USA.
Fax +1 305 326 7065.

- 1 Lemieur TP, Rodriguez JL, Jacobs DM, *et al*. Wound management in perforated appendicitis. *Am Surg* 1999;65:439–43.
- 2 Song F, Glenny AM. *Antimicrobial prophylaxis in colorectal surgery*. York: NHS Centre for Reviews and Dissemination, 1998. <http://www.york.ac.uk/inst/crd/ehcb.htm>
- 3 Schulz KF, Chalmers I, Hayes RJ, *et al*. Empirical evidence of bias. Dimensions of methodological quality associated with estimates of treatment effects in controlled trials. *JAMA* 1995;273:408–12.

*Evaluation and delayed primary closure (E/DPC) v primary closure (PC) for dirty abdominal wounds**

Outcome at ≥ 1 month	E/DPC	PC	RRR (95% CI)	NNT (CI)
Wound infection	12%	48%	76% (31 to 92)	3 (2 to 9)

*Abbreviations defined in glossary; RRR, NNT, and CI calculated from data in article.