Use of an impervious wound-edge protector decreased postoperative wound infection

Sookhai S, Redmond HP, Deasy JM. **Impervious wound-edge protector to reduce postoperative wound infection: a randomised, controlled trial** [Letter]. Lancet. 1999 May 8;353:1585.

Question

In patients having abdominal surgery, does the use of an impervious wound-edge protector reduce postoperative wound infections?

Design

Randomized {allocation concealed*},† blinded (outcome assessor),* controlled trial with 30-day follow-up.

Setting

Cork, Ireland.

Patients

352 patients (56% women) who were having transabdominal surgery for gastrointestinal disease. Follow-up was complete.

Intervention

All patients received systemic antibiotic prophylaxis and povidone-iodine skin preparation and were allocated either to an impervious wound-edge protector ($n = 170$) or to no wound-edge protector ($n = 182$). The protector was an impermeable plastic drape attached to the abdomen with adhesive patches. A hole in the middle of the protector ringed by semirigid plastic protected the abdominal wound edge from viscera, viscera contents, contaminated instruments, and gloves.

Main outcome measures

Postoperative wound infection (presence of purulent discharge, culture-positive wound discharge, pain or tenderness, localized swelling, erythema, or cellulitis occurring within 30 d of surgery). The wounds were categorized for extent of contamination: clean-contaminated (minor interruption in aseptic technique or minor spillage from the gastrointestinal tract), contaminated (major interruption in aseptic technique or substantial spillage), and dirty (gross fecal spillage).

Main results

The use of impervious wound-edge protectors decreased the rate of postoperative wound infection {$P < 0.001$}‡ (Table). Within the 3 contamination groups, wound-edge protectors decreased the rate of infection in patients with contaminated wounds {$P < 0.001$}‡ but not in patients with clean-contaminated {$P = 0.12$}‡ or dirty {$P = 0.15$}‡ wounds (Table).

Conclusion

In patients having abdominal surgery, the use of an impervious wound-edge protector reduced postoperative wound infections.

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*See Glossary.
†Information supplied by author.
‡*P* values calculated from data in article.

Impervious wound-edge protector vs no protector for wound infection rates at up to 30 days after abdominal surgery§

Wound status	Impervious wound-edge protector	No protector	RRR (95% CI)	NNT (CI)
All wounds	14%	30%	54% (30 to 71)	7 (4 to 13)
Clean-contaminated wounds	7%	13%	45% (–16 to 74)	Not significant
Contaminated wounds	24%	67%	64% (33 to 81)	3 (2 to 6)
Dirty wounds	75%	94%	21% (–9 to 57)	Not significant

§Abbreviations defined in Glossary; RRR, NNT, and CI calculated from data in article.

Commentary

Wound infections are an important cause of morbidity after abdominal surgery. Perioperative antibiotic prophylaxis reduces the risk for infection in clean-contaminated surgery; other prophylactic strategies are less well defined. The study by Sookhai and colleagues suggests that use of a plastic wound-edge protector can further reduce risk for infection. The data are both statistically significant and biologically plausible: The greatest benefit occurs in contaminated wounds, where the bacterial load in previously uninfected subcutaneous tissues is the greatest.

Should we change surgical behavior? I believe not, although the findings merit further evaluation. Wound infection rates in this series are high. The authors' baseline rate of 13% in clean-contaminated wounds is substantially above the 3.3% rate reported by the U.S. National Nosocomial Infection Surveillance System study (1). Furthermore, previous randomized trials of wound protectors have failed to show a reduction in wound infection rates (2, 3). Finally, the economic benefit postulated by the authors is almost certainly inflated.

An abbreviated report such as this research letter is a tease that leaves the reader intrigued but unconvinced. One wants further details on inclusion and exclusion criteria, the definitions used, the methods of surveillance, the analytic plan, and the outcome data describing the nature and timing of the wound infections that developed. On the basis of this elliptical report, the practice appears reasonable when the probability of contamination is high, for example, when operating in penetrating abdominal trauma or on an obstructed gastrointestinal tract. Wider application should await the result of a more rigorously designed multicenter study.

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