Topical antibiotics help to reduce sternal infections

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See related article on pages 1631-40.

Sternal wound infections continue to be a source of morbidity, mortality, and increased medical costs in patients undergoing cardiac surgery. Furthermore, the US Center for Medicare and Medicaid Services will no longer reimburse hospital costs incurred in the treatment of sternal wound infections after cardiac surgery.

In their review of 14 studies, published in this issue of the *Journal*, Kowalewski and coworkers¹ found that implantable gentamicin collagen sponges significantly reduced the risk of both deep and superficial sternal wound infections by 40%.¹ Mortality was not influenced by implantable gentamicin collagen sponges, however, and these beneficial effects were attenuated in patients receiving bilateral internal thoracic artery grafts, who as a group had a higher incidence of sternal wound infections. These results are at odds with those of the Implantable Gentamicin Collagen Sponge on Sternal Wound Infections Following Cardiac Surgery Trial (SWIPE-1), which failed to show a beneficial effect for implantable gentamicin collagen sponge therapy.² This may have been due to a failure in that trial to follow the manufacturer's sponge implantation protocol, which resulted in longer exposure of the gentamicin sponge in a saline solution before application, thus lowering the concentration of gentamicin in the sponge.^{3,4}

The results of the meta-analysis of Kowalewski and coworkers¹ reinforce the concept that the application of topical antibiotics to the sternum during cardiac surgery significantly reduces the incidence of sternal wound infections. In addition to gentamicin, topical vancomycin has also been shown to reduce significantly the incidence of sternal wound infections.⁵ Recently my own group reported that topical vancomycin applied to the sternal edges in conjunction with perioperative antibiotics and tight glycemic control eliminated all sternal wound infections in 1075 patients undergoing cardiac surgical procedures,

among whom 34% had diabetes mellitus, with 35% of the patients diabetes dependent on insulin.⁶

Concerns have been raised that the use of topical antibiotics might lead to the emergence of resistant organisms. Although this was not addressed by Kowalewski and coworkers¹ in the study published here, my coworkers and I found that topical vancomycin did not result in persistently elevated postoperative antibiotic levels after 6 days and did not potentiate the emergence of drug-resistant infections or contribute to postoperative renal toxicity at 1-year follow-up.^{6,7}

The use of perioperative antibiotics, the maintenance of glycemic control with intravenous insulin infusions, and the avoidance of bone wax have all contributed to a decreased incidence of sternal wound infections.⁸⁻¹² This meta-analysis by Kowalewski and coworkers,¹ along with my own group's studies and those of others, now suggest that topical antibiotics applied to the sternal edges may further reduce or even eliminate all sternal wound infections. Strong consideration should be given to using some form of topical antibiotics in all cardiac surgical patients undergoing median sternotomy.

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