Perforated surgical gloves associated with surgical site infection risk

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Surgical gloves that develop holes or leaks during a procedure appear to increase the risk of infection at the surgical site among patients who are not given antibiotics beforehand, according to a report in the June issue of *Archives of Surgery*, one of the JAMA/Archives journals.

Despite substantial efforts to maintain sterile conditions during surgery, pathogens can still be transmitted through contact with skin or blood, according to background information in the article. To prevent skin-borne pathogens on the hands from being transferred to patients, surgical staff wear sterile gloves as a protective barrier. When gloves are perforated by needle puncture, spiked bone fragments, sharp surfaces on surgical instruments or another cause, the barrier breaks down and bacteria can be transferred. The frequency of glove perforation increases in surgical procedures lasting more than two hours and has been found to range from 8 percent to 50 percent.

Heidi Misteli, M.D., of University Hospital Basel, Basel, Switzerland, and colleagues studied a series of 4,417 surgical procedures performed at the facility between 2000 and 2001. Of these, 677 involved glove perforations, whereas surgical gloves remained intact during 3,470 procedures. Antimicrobial prophylaxis, (antibiotic therapy given before surgery to prevent infection) was used in 3,233 of the surgeries, including 605 in which perforated gloves were detected.

A total of 188 instances of surgical site infection (4.5 percent) were identified, including 51 (7.5 percent) in procedures performed with

perforated gloves and 137 (3.9 percent) in procedures where gloves remained intact. In procedures involving antimicrobial prophylaxis, glove perforation was not associated with surgical site infection after other, related factors were considered. "In the absence of surgical antimicrobial prophylaxis, glove leakage was associated with a surgical site infection rate of 12.7 percent, as opposed to 2.9 percent when asepsis was not breached," the authors write. "This difference proved to be statistically significant when assessed with both univariate and multivariate analyses."

Measures to decrease the risk of glove perforation—including double gloving and replacing gloves after a specified period of time—are effective and safe and should be encouraged, although implementing them in clinical practice is sometimes difficult, the authors note.

"Although surgical antimicrobial prophylaxis has been demonstrated to prevent surgical site infection after clean surgery in several randomized controlled trials, there is no current consensus regarding its use in this area," they conclude. "The present results support an extended indication of surgical antimicrobial prophylaxis to all clean procedures in the absence of strict precautions taken to prevent glove perforation. The advantages of this surgical site infection prevention strategy, however, must be balanced against the costs and adverse effects of the prophylactic antimicrobials, such as drug reactions or increased bacterial resistance."

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