Blunt-tipped needles reduced the incidence of glove puncture during abdominal closure


Objective
To determine whether the use of blunt-tipped needles compared with cutting needles reduces the incidence of glove puncture and needlestick injury during abdominal closure in general surgery.

Design
Randomised controlled trial.

Setting
Surgical unit in England.

Patients
85 patients who were having elective colorectal surgery between October 1993 and October 1994. 3 surgeons did the surgery.

Intervention
Patients were allocated to standard mass closure of the abdomen with the surgeon using a number-1 polydioxanone suture with either blunt-tipped (n = 46) or cutting (n = 39) needles. Immediately before closure, the surgeon put on new gloves. After closure, gloves were examined both by inflating them with air and then immersing them in water and by filling them with water. During the second half of the study, gloves were also tested using an electrical detection device that sounded an alarm if the glove was punctured.

Main outcome measure
Glove-puncture rate.

Main results
Fewer glove punctures occurred using blunt-tipped needles compared with cutting needles (6.5% vs 36%, P < 0.001). ([This absolute risk reduction of 29.5% means that 3 patients would need to have abdominal closure with the surgeon using a blunt-tipped needle (rather than a cutting needle) to prevent 1 additional glove puncture, 95% CI 2 to 8; the relative risk reduction was 82%, CI 46% to 94%].)* None of the punctures led to needlestick injury. Most glove punctures were in the nondominant hand (12 with a cutting needle and 2 with a blunt needle).

Conclusion
The use of blunt-tipped needles compared with cutting needles by surgeons for abdominal closure during surgery reduced the incidence of glove puncture.

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*Numbers calculated from data in article

Commentary
The study by Hartley and colleagues confirms the high rate of glove punctures that occurs during general surgical procedures (1). Most glove punctures are not immediately recognised; therefore, they pose a risk for prolonged cutaneous exposure to blood and, thus, to blood-borne disease that can be transmitted from patient to surgeon (2). Relatively few interventions in randomised clinical trials have been shown to reduce the risk for glove punctures, with the exception of the use of blunt-tipped needles and double gloving (3).

Two methodological issues, however, are relevant to the interpretation of this study. First, the authors describe a method of closure during which the needle is guided with the finger of the non-dominant hand. Therefore, the results of this study may not be relevant to surgeons who do not use this method of closure. Second, because the surgeons were (presumably) not blinded to the type of needle they were using, they may have changed their surgical technique. The change in technique rather than the type of needle might explain the decreased glove-puncture rate in the group of patients allocated to the blunt needle. Further, no needlestick injuries (which pose a much greater risk for the transmission of blood-borne disease) occurred in either group. The advantages of few glove punctures, which was not assessed in this study, might include a reduced risk for disease transmission from surgeon to patient and a potentially lower wound-infection rate, although no evidence exists to show that decreasing the rate of glove puncture decreases the risk for transmission of disease. Nevertheless, the use of blunt needles (along with double gloves) should be adopted for every mass closure when using the closure technique described in this study.

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