Frequency of glove puncture in the post mortem room

J Weston, G Locker

Abstract
The post mortem room is a potential source of danger from contamination caused by glove punctures. The objective of this study was to assess the incidence of hand injury and hand contamination during post mortem examinations. A prospective study of injury and glove puncture rate was conducted during post mortem examinations performed in 1990 on adults in Northwick Park Hospital mortuary. Four pathologists and two assistants performed a total of 44 post mortem examinations on adults. All participants completed a questionnaire after each examination, recording the total number of gloves used and the number of hand injuries and glove perforations sustained. Just over 8·3% of gloves were punctured; 31·8% of these punctures went unnoticed. Evisceration was the procedure most likely to result in hand contamination.

The study highlights a significant risk which could be reduced by more care, frequent glove changes, and hand washing during post mortem examinations. In particular, gloves should be changed and hand washed when evisceration has been completed.

The protection of medical laboratory workers is of great importance and many precautionary measures have found their way into standard medical laboratory practice. One obvious safety measure is the donning of gloves before handling fresh human tissue.

The post mortem room is a potential source of danger to both pathologists and their assistants. Because pathologists are not required to protect patients from infection in the same way as surgeons are, they may neglect to protect themselves against contamination during post mortem examinations.

Like surgeons, pathologists use sharp instruments in the presence of free body fluids. Thus if they are injured they may run similar risks of contamination. Furthermore, a glove may be punctured in the course of a post mortem examination without actually incurring an injury, but a pre-existing skin lesion may become contaminated. This second risk may be compounded if the puncture goes unnoticed so that the glove is not changed and the hand not washed for some time. In particular, evisceration of the cadaver involves the use of sharp instruments and may expose jagged edges of bone that are potential sources of danger.

To quantify these risks, glove punctures and hand injuries were recorded during post mortem examinations of adults. The relative risk of the evisceration procedure was also assessed.

Methods
Four pathologists and two technicians took part in the study. One of the pathologists was of consultant grade with over 20 years of post mortem examination experience. The other three were juniors with between one and five

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References:
Summary of results

| Number of post mortem examinations | 44 |
| Total number of gloves used | 262 |
| Punctures | 22 |
| Unused gloves | 225 |
| Punctures | 1 |
| Eviscerated by technicians | 12 |
| Gloves worn by technician | 85 |
| Punctures by technician | 10 |
| Gloves worn by Drs | 76 |
| Punctures by Drs | 5 |

Number Rate $\chi^2$ test Significance

- Total number of post mortem examinations | 44 | 0.080 | 17.01 | $p < 0.001$
- Total gloves used | 262 | 0.004 | |
- Punctures | 22 | 0.222 | |
- Unused gloves | 225 | 0.066 | 5.68 | $p < 0.05$
- Punctures | 1 | |
- Eviscerated by technicians | 12 | |
- Gloves worn by technician | 85 | |
- Punctures by technician | 10 | |
- Gloves worn by Drs | 76 | |
- Punctures by Drs | 5 | |

Discussion

Only one of the post mortem examinations considered afforded a known risk of contamination (from tuberculosis). A significant number of glove punctures occurred, however, (8-3%; $p < 0.001$) at a rate of 0-5/exam. Of these, 31.8% went unnoticed. The magnitude of these results compare with those found during assessment of surgical procedures. Although gloves are impermeable to HIV and hepatitis B, punctured gloves are not. Pathologists have also contracted tuberculosis as a result of hand wounds.

Two injuries were sustained during the course of the experimental period. Both were relatively minor and were treated in accordance with current laboratory safety recommendations. The results presented here, however, show that evisceration is an especially risky procedure in terms of glove puncture. Many of these punctures went unnoticed. In these instances a pre-existing hand lesion may be bathed in infected material for several hours (because evisceration is the first procedure in the post mortem examination) and never treated according to current safety procedures. The risk of contamination from a puncture without concurrent injury may therefore be greater than a puncture associated with an injury.

The findings highlight a significant risk to mortuary workers which could be reduced in several ways. Education of both pathologist and technician is important to promote awareness of this risk. It has been suggested that double gloving reduces the risk of hand contamination to surgeons. We performed a small number of post mortem examinations wearing two pairs of gloves; in contrast to the findings of Gerberding et al, no significant protection was afforded.

In conclusion, the most important way of reducing the risk associated with glove punctures in the mortuary should be frequent glove changes and hand washing throughout the post mortem examination to reduce the risk of contamination as a result of unnoticed glove punctures. In particular, gloves should be changed and hands washed at the end of the evisceration procedure.
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