

Eye protection during mastoid surgery

T. E. MITCHELL, F.R.C.S., R. G. COURTENAY-HARRIS, F.R.C.S., A. J. INNES, F.R.C.S

Abstract

A questionnaire was sent to all Full Members of the British Association of Otolaryngologists to ascertain whether and what type of eye protection surgeons and theatre nurses wear during mastoid surgery. Despite Department of Health recommendations only 58 per cent of surgeons and 19 per cent of theatre nurses routinely wear any form of eye protection.

Key words: Eye protective devices; Mastoid, surgery

Introduction

There is continuing concern about the risk of transmission of blood borne infections such as hepatitis B and human immunodeficiency virus (HIV) from patients to health care workers. Surgeons and theatre nurses are at risk from needlestick injuries and contamination of traumatised skin or mucous membranes. A case of HIV seroconversion after conjunctival contamination has been reported (Gioannini *et al.*, 1988).

It is recognized practice to perform the initial drilling of bone during mastoid exploration without the use of an operating microscope (Ransome, 1986). The Department of Health (1990) recommended that the mucous membranes of the eyes, mouth and nose should be protected during procedures in which there was a risk of blood splashes. Our aim was to establish whether surgeons and theatre nurses routinely followed these recommendations during mastoid surgery.

Method

A questionnaire was sent to the 514 Full Members of the British Association of Otolaryngologists in August 1994. This asked whether the surgeon wears eye protection, including his, or her, usual spectacles, when using a high speed drill during mastoid surgery, what type of eye protection is used and whether the assisting theatre nurse wears eye protection.

Results

Three hundred and seventy (72 per cent) completed questionnaires were returned. Table I shows the responses for the surgeon. Only 215 (58 per cent) always wore eye protection and 67 (18 per cent)

admitted that they never wore any form of eye protection. Only 71 (14 per cent) stated that the theatre nurse always wore eye protection (Table II).

Discussion

Transmission of hepatitis B or HIV from a patient to a health care worker may occur if infected blood or body fluids are directly inoculated into the circulation or there is contact with a breach in the skin or intact mucous membranes. During mastoid surgery there is a risk of contamination of the conjunctiva with particles of bone, blood and middle ear fluid, which has been shown to contain HIV in infected individuals (Sooy *et al.*, 1987).

Blood splashes onto spectacles have been described during general surgical (Brearley and Buist, 1989), orthopaedic (Giachino *et al.*, 1988), minor surgical procedures (Hurren, 1993) and in the

TABLE I

Eye protection	Always	Usually	Sometimes
Usual spectacles	136	12	10
Protective spectacles	46	18	36
Visor	5	2	6
Usual spectacles + protective spectacles	5	1	1
Usual spectacles + visor	4	1	1
Protective spectacles + visor	3		
Microscope (for all drilling)	7		
Usual spectacles + occasionally protective spectacles	4		
Usual spectacles + occasionally visor	4		
Unspecified	1		
Total surgeons	215	34	54

Sixty-seven surgeons never wear any form of eye protection.

From the Department of Otolaryngology, Norfolk and Norwich Hospital, Brunswick Road, Norwich, NR1 3JR, UK.
Accepted for publication: 14 April 1995.

TABLE II

Eye protection	Always	Usually	Sometimes
Theatre nurse	71	74	120

One hundred and two theatre nurses never wear any form of eye protection.

accident and emergency department (Mackay *et al.*, 1994). Prior *et al.* (1993) demonstrated contamination of protective spectacles with blood during a range of ENT procedures including mastoidectomy. Figure 1 demonstrates how this contamination occurs.

If eye protection is not worn conjunctival contamination may occur and blood splashes may be so small that they do not stimulate a blink reflex (Mackay *et al.*, 1994). Even if the blood is cleared by tears through the nasolacrimal duct into the nasal cavity, there is a theoretical risk of transmission via the nasal mucosa (Giachino *et al.*, 1988). Hepatitis B can be transmitted via the conjunctiva in primates (Bond *et al.*, 1982) and a case of HIV infection in a nurse following conjunctival contamination has been reported (Gioannini *et al.*, 1988).

Thus occupational transmission of hepatitis B and HIV via the conjunctiva is a real risk. The Department of Health (1990) recommended that the mucous membranes of the eyes, mouth and nose should be protected from blood splashes and the Joint Working Party of the Hospital Infection Society and the Surgical Infection Study Group (1992) advised that extra precautions including eye protection should be taken when operating on patients known to be hepatitis B or HIV positive and in 'high risk' cases including orthopaedic procedures involving power tools. Recent articles have supported these recommendations (Lannigan *et al.*, 1989; Prior *et al.*, 1993).

Nevertheless only 58 per cent of those replying to our questionnaire routinely wear eye protection. Moreover the responses suggest that only 19 per cent of theatre nurses routinely wear eye protection. It is possible that this is an underestimate because the data have been provided by surgeons and not theatre nurses directly. Theatre nurses are likely to be at less risk than surgeons since they are generally further from the operative field. However, Lannigan *et al.* (1989) have demonstrated that irrigation fluid during temporal bone dissection may spread up to 41 cm from the point of drilling and we have noticed splashes on the theatre nurse's spectacles following mastoid surgery. We will be investigating this further in order to determine how frequently such contamination occurs.

The proportion of patients undergoing mastoid surgery who are hepatitis B or HIV positive is unknown but likely to be very small. However, in the absence of routine pre-operative testing, there is no way of accurately identifying this group. It is therefore illogical to wear eye protection for selected cases. In any event 18 per cent of surgeons admitted that they never wore any eye protection. A



FIG. 1

Particulate spray generated during drilling of the mastoid.

significant number of otolaryngologists are therefore putting themselves at risk to blood borne infection via conjunctival contamination. We strongly recommend that eye protection should be worn routinely by all surgeons and theatre nurses during mastoid surgery.

Acknowledgement

We would like to thank all those who completed and returned our questionnaire.

References

- Bond, W. W., Petersen, N. J., Favero, M. S., Ebert, J. W., Maynard, J. E. (1982) Transmission of type B viral hepatitis via eye inoculation of a chimpanzee. *Journal of Clinical Microbiology* **15**: 533-534.
- Brearley, S., Buist, L. J. (1989) Blood splashes: an underestimated hazard to surgeons. *British Medical Journal* **299**: 1315.
- Department of Health (1990) *Recommendations of the Expert Advisory Group on AIDS. Guidance for Clinical Health Care Workers: Protection Against Infection with HIV and Hepatitis Viruses*. HMSO, London.
- Giachino, A., Profitt, A., Taine, W. (1988) Contamination of the conjunctiva of the orthopaedic surgeon. *Journal of Bone and Joint Surgery* **70A**: 126-127.
- Gioannini, P., Sinnico, A., Cariti, G., Luccini, A., Paggi, G.

- Giachino, O. (1988) HIV infection acquired by a nurse. *European Journal of Epidemiology* **4**: 119–120.
- Hurren, J. S. (1993) Avoiding exposure to HIV and hepatitis. *British Medical Journal* **306**: 335–336.
- Joint Working Party of the Hospital Infection Society and the Surgical Infection Study Group (1992) Risks to surgeons and patients from HIV and hepatitis: Guidelines on precautions and management of exposure to blood and body fluids. *British Medical Journal* **305**: 1337–1343.
- Lannigan, F. J., Jones, N. S., von Schoenberg, M. V. (1989) An avoidable occupational hazard during mastoid surgery. *Journal of Laryngology and Otology* **103**: 566.
- Mackay, G., McFarlane, A., Gregori, A. (1994) Conjunctival exposure in casualty. *Hospital Update* **20**: 461.
- Prior, A. J., Montgomery, P. Q., Srinivasan, V. (1993) Eye protection in ear, nose and throat surgery. *Journal of Laryngology and Otology* **107**: 618–619.
- Ransome, J. (1986) The Ear. In *Rob and Smith's Operative Surgery*. 4th Edition. (Ballantyne, J. C., Morrison, A., eds.), Butterworths, London, pp 67–71.
- Sooy, C. D., Gerberding, J. L., Kaplan, M. J. (1987) The risk for otolaryngologists who treat patients with AIDS and AIDS virus infection: report of an in-process study. *Laryngoscope* **97**: 430–434.

Address for correspondence:
Mr A. J. Innes,
ENT Department,
Norfolk and Norwich Hospital,
Brunswick Road,
Norwich NR1 3SR.