CORRESPONDENCE

Glove puncture in the post mortem room

Weston and Locker document the high incidence of glove puncture in the post mortem room and advocate "frequent glove changes and hand washing throughout the post mortem examination."¹ An alternative is to wear thicker gloves which are less easily punctured. I have used for some time now Long Nitrosolve gloves (Marigold Industrial) over a standard pair of thin surgical gloves. The heavy gloves are resistant to puncture and also afford protection against splashes almost up to the elbow. They feel clumsy at first but one soon becomes used to them. They can be washed and reused several times and so are also economical.

R LINDLEY
Cellular Pathology,
Pathology Laboratory,
All Saints Hospital,
Chatham,
Kent ME4 5NG

¹ Weston J, Locker G. Frequency of glove puncture in the post mortem room. *J Clin Pathol* 1992;45:177-8.

Pathologists should be grateful for the data provided by Weston and Locker on the prevalence of glove punctures incurred during necropsies. But I worry about their conclusions.

They show an 8% prevalence of glove punctures across health care workers in the mortuary, and a 3-4-fold increased risk of puncture if a technician eviscerated the body compared with a pathologist. However, I think that more than "education... to promote awareness" is required. The suggested remedy—frequent changing of gloves during the procedure—is analogous to shutting stable doors after bolting horses.

The writers state that a small trial of double gloving was performed but that no significant protection was provided, without giving us the actual figures. Since 1989 I have performed more than 400 necropsies on HIV seropositive adults and children, always wearing two pairs of gloves: inner "surgical" gloves and outer, thicker household rubber gloves. Other pathologists regularly performing HIV seropositive necropsies with whom I have discussed the issue also favour such double gloving.

I have not rigorously tested my used gloves, but on the subjectively uncommon occasions when the outer glove was punctured, the inner glove appeared to have prevented any contamination of the skin. Given my prejudices, and the fact that most of my necropsy work is on infectious disease cases, I would now be unwilling to partake in a controlled comparative trial of single versus double gloving.

May I recommend discussion of the following proposals for necropsies:

1 Medicine and pathology have irrevocably

changed since the HIV epidemic arrived: thus one should assume that every cadaver is potentially infected.

2 Universal precautions, involving the use of double gloves, impermeable disposable gowns, masks, hats, and eye protection, should be used during all necropsies. This applies to both technicians and pathologists.

3 We should move to minimise the chance of glove puncture by adopting non-pointed instruments; round-ended scissors are obvious, and non-pointed scalpel blades are available.

4 We should re-evaluate dissection procedures in the light of the questions being asked; for example, in HIV seropositive cases removal of the prostate does not usually produce further relevant information and could be omitted.

S LUCAS
Department of Histopathology,
University College and
Middlesex School of Medicine,
University Street,
London WC1E 6JF

I read with interest the article by Weston and Locker regarding the frequency of glove puncture in the post mortem room. I am sure that few practising histopathologists could argue with their finding that glove punctures, both noticed and unnoticed, are extremely common, and a similar observation was made by Babb *et al* in 1989,¹ although actual wounds are, in my experience, comparatively rare in experienced staff. This has undoubtedly always been the case in post mortem work and consequently, were it to pose a real rather than a potential health risk, there should be good evidence available. In their morbidity survey of post mortem room staff, Hall *et al* found no recorded days of absence for skin disorders or cuts and lacerations among pathologists and a very low number for technicians.² Consequently, I would conclude that unnoticed glove puncture is not an important health hazard and would not justify the major expense incurred by using two pairs of gloves for each post mortem examination. It would appear from the available evidence that the risks associated with glove puncture are theoretical rather than real and do not justify multiple glove changes during necropsy examination. The potential for infection is adequately dealt with by normal post mortem room hygiene procedures.

PJ DUNN
Department of Pathology,
Royal Infirmary,
Castle Street,
Worcester WR1 3AS

¹ Babb JR, Hall AJ, Marlin R, Ayliffe GAJ. Bacterial sampling of post mortem rooms. *J Clin Pathol* 1989;42:682-8.

² Hall AJ, Aw TL, Harrington JM. Morbidity survey of post mortem room staff. *J Clin Pathol* 1991;44:433-5.

Drs Weston and Locker comment:

We note that Lindley and Lucas advocate wearing heavy duty gloves over surgical gloves for post mortem examinations. We have ordered some Long Nitrosolve gloves to try out. Dr Lucas suggests that his inner gloves protect him from skin contamination if his outer gloves are punctured. However, as we point out in our paper 31.8% of glove punctures go unnoticed and this is where the danger of prolonged skin contact with potentially infected material lies.

We do not mean to imply that changing gloves frequently and especially at the end of the evisceration protects against hand contamination, but that it prevents *prolonged* skin contact with contaminated material via an unnoticed glove puncture.

Dr Dunn's opinion that the extra cost incurred by frequent glove changes during postmortem examinations is not justified concerns us. The paper cited reports that one case of tuberculosis and two of hepatitis B occurred in 76 mortuary technicians over 12 months. There were also 21 minor lacerations. While this may not cause much immediate morbidity, the consequences of infection with HIV or indeed with hepatitis B or tuberculosis due to an unnoticed glove puncture would be incalculable. We agree that to date the risk of infection via an unnoticed glove puncture may have been slight rather than real, but as the prevalence of HIV increases this trend could well reverse and is not a risk worth taking. All possible protective measures should be practised. This view also seems to be held by Dr Lucas.

Diagnostic value of fibronectin determination in cerebrospinal fluid

Torre *et al* recently reported increased concentrations of fibronectin in the cerebrospinal fluid (CSF) of patients with bacterial meningitis, but not with viral meningitis, determined by a commercial turbidimetric immunoassay.¹ Their results correspond to our study on the differential diagnostic value of CSF fibronectin determination using an enzyme linked immunosorbent assay,² although their mean (SEM) control concentrations were somewhat higher (6.7 (1.3) mg/l as opposed to 3.3 (0.3) mg/l) and their mean concentrations in bacterial meningitis were far lower (13.9 (6.1) mg/l compared with 64.0 (6.3) mg/l in our study. Their observation of decreased fibronectin concentration (2.2 (1.8) mg/l) in viral meningitis is very interesting as we did not find any decrease in various neurological disorders including lumbar disk disease, multiple sclerosis, acute demyelinating polyradiculoneuropathy, Guillain-Barré, neurologically asymptomatic HIV infection, tick-borne encephalitis, and diffuse leptomeningeal neoplasia. However, we detected very high concentrations of CSF fibronectin not only in bacterial meningitis but also in tick-borne encephalitis (26.7 (4.4) mg/l),² neuroborreliosis (27.0 (3.6) mg/l),² and notably in leptomeningeal neoplasia (58.4 (16.0) mg/l).¹ Clinical data will help to distinguish infectious from neoplastic cerebrospinal disease in most patients but increased CSF

fibronectin concentrations will not contribute to the differential diagnosis in complicated clinical settings where definite proof by positive CSF cytology should be sought. However, a few cancer patients in our study had a completely normal routine CSF examination including cytology, glucose, lactate, albumin, IgG, and IgM, but they had increased CSF fibronectin and later turned out to have leptomeningeal metastases, as shown by cytology. Therefore, determination of CSF fibronectin may be a useful diagnostic and monitoring tool in the staging and follow up of patients with disseminated cancer.

M WELLER
National Institute of Health,
Clinical Neuroscience Branch,
Bethesda, MD
USA

- 1 Torre D, Zeroli C, Issi M, Fiori GP, Ferraro G, Speranza F. Cerebrospinal fluid concentration of fibronectin in meningitis. *J Clin Pathol* 1991;44:783-4.
- 2 Weller M, Sommer N, Stevens A, Wiethölter H. Increased intrathecal synthesis of fibronectin in bacterial and carcinomatous meningitis. *Acta Neurol Scand* 1990;82:138-42.
- 3 Weller M, Stevens A, Sommer N, Wiethölter H, Dichgans J. Cerebrospinal fluid interleukins, immunoglobulins, and fibronectin in neuroborreliosis. *Arch Neurol* 1991;48:837-41.

Use of computers in anticoagulant clinics

The guidelines on oral anticoagulation published by the British Society for Haematology (BSH) acknowledged that computers may have a role in both the analysis of therapeutic quality control and in the clerical support of an anticoagulant clinic.¹ Their use in the production of dose schedules for individual patients was not recommended until reliable patient database programmes had been developed.

Until August 1990 our anticoagulant clinic had been performed by either a consultant haematologist or a medical senior house officer. Each patient had been allocated a target International Normalised Ratio (INR) range according to the BSH guidelines. In an attempt to improve our anticoagulant control we introduced a previously reported computer programme for determining the dose of oral anticoagulant.²

Mean ($\pm$ ISD) INR for patients whose target INR ranges are 3.0-4.5 (O) and 2.0-3.0 (●). On average each point represents the results from 66 patients for the range 3.0-4.5 and 139 patients for the range 2.0-3.0.

Results over the past 12 months indicate that the INRs have shown a consistent improvement. The figure shows that the mean INR for each patient group has progressively moved nearer to the mid point of the therapeutic ranges—3.75 for the range 3.0-4.5 and 2.5 for the range 2.0-3.0, there being too few patients in the range 2.0-2.5 to analyse. The percentage of patients within the therapeutic range each month for these two groups has increased from 50% to 70% and from 48% to 65%, respectively.

As a result of the improved anticoagulant control the average recall between visits has also increased from 26 to 36 days and from 21 to 33 days for the two groups. The results have been achieved without any apparent increased risk of serious bleeding complications. All episodes of bleeding have been recorded on each patient's computer record which allows the number of such episodes to be monitored.

The use of this computer program for determining the dose of oral anticoagulants has improved our therapeutic control. The clinic is now also run by a staff pharmacist acting under the direction of a consultant haematologist, thus freeing up medical time.

Among other benefits which have ensued is the improved advice given to new patients, which is part of the program. This part of the program consists of a series of questions for all new patients. As directed by the computer, the pharmacist will question the patients to ensure that they know why they have been given warfarin, the dose and colour of their tablets, the side effects of warfarin together with which drugs should be avoided. This ensures that each patient is fully counselled regarding their anticoagulation. This program will allow comparisons of performance to be made between centres.

L KENT
MJ GALLOWAY
Department of Haematology
General Hospital
Bishop Auckland
Co Durham DL14 6AD

- 1 British Society for Haematology. Guidelines on oral anticoagulation: second edition. *J Clin Pathol* 1990;43:177-83.
- 2 Ryan PJ, Gilbert M, Rose PE. Computer control of anticoagulant dose for therapeutic management. *Br Med J* 1989;299:1207-9.

Audit of necropsies in a British district general hospital

In response to the recent article about audit of necropsies¹ we were prompted to carry out a retrospective study of the past 200 adult necropsies performed at the Mayday Hospital during 1990 and 1991.

Our criteria for grading diagnostic dis-

crepancies between the clinical cause of death and the post mortem findings differed from Harris and Blundell's study, as we used a single category for additional major pathology without "feed-back on tests" group.

The data were derived from the clinical and necropsy diagnoses obtained from post mortem request forms and necropsy reports. The diagnoses were then independently graded by three histopathologists (TPM, MJC, and SMT) using up to three of the criteria given below. The grades were then compared and only those agreed by at least two of the pathologists were accepted for each case. Results were later presented at the hospital clinical audit meeting (table).

There has been general agreement that necropsies have a central role in clinical audit, yet despite this the necropsy rate continues to fall in this era of audit.

Our study differs from that of Harris and Blundell in several ways. Both studies nevertheless emphasise the significant discrepancy between clinical and necropsy diagnosis. This discrepancy is sufficiently high to question the use of mortality statistics as derived from death certificates in the distribution of medical resources.

Many clinicians still question the relevance and validity of necropsy results. Our study, however, shows that most necropsies provide considerable information regarding the main terminal pathological process as well as revealing important findings that may not directly contribute to the cause of death.

The feedback from our study indicated that a summary of the main post mortem findings was desired by the clinicians even more than a full necropsy report. Despite the lack of resources in many hospitals it would not seem impossible to provide both a summary of findings and a concise necropsy report which would at least in part fulfill the Intercollegiate Working Party's recommendations on necropsy.²

In conclusion, necropsies must be considered as an essential part of clinical management and audit. Therefore, we actively support the use of necropsy and encourage our clinical colleagues in this matter. We also feel that additional resources—for example, secretarial and technical personnel—should be provided so that the underresourced pathology laboratories can provide the quantity and quality of necropsies as laid out by the Intercollegiate Working Party recommendations.

TP MEARS
MJ COPPEN
SM THOMAS
Mayday University Hospital,
Thornton Heath,
Surrey CR4 7YE

- 1 Harris MD, Blundell JW. Audit of necropsies in a British General Hospital. *J Clin Pathol* 1991;44:862-5.
- 2 Report of the Joint Working Party of the Royal College of Pathologists, the Royal College of Physicians of London and the Royal College of Surgeons of England. *The autopsy and audit*. London: RCP, 1991.

Table Comparison of necropsy findings between Harris and Blundell's study and ours

Findings	Harris and Blundell study	Mayday hospital
Major discrepancy in diagnosis	13%	32%
Major unsuspected diagnosis	30%	46%
Important clarification in diagnosis	63%	38%
Confirms presence of main diagnosis	86%	60%
No contribution	2%	0%
Major additional pathology	51%	47%