Editorials

The autopsy as a clinical investigation

In a survey of the attitudes of clinical consultants to autopsies (McGoogan & Cameron 1978), comments made by respondents to a questionnaire included the following:

'If the autopsy is declining, then I am not too concerned.'
'The reported fall in the autopsy rate is deplorable.'
'We are not usually seeking more information, since the entire living disease process has often been fully documented.'
'Abnormal anatomy does not commonly explain the cause of death, while abnormal function increasingly does.'
'The autopsy is one of the most important forms of quality control, and a good encouragement to honesty.'
'I am sure that the fall in the autopsy rate merely reflects the increase in diagnostic techniques that allow a definitive diagnosis, thus happily eliminating the need for autopsy.'

Any consideration of the hospital autopsy must take into account the attitudes of clinicians. As can be seen from these statements by consultant clinicians, these vary greatly. Physicians and surgeons must judge whether they indicate a change over the years: whether, in fact, clinicians may be – at least in part – responsible for the fact that hospital autopsy rates have fallen markedly in recent years (Cameron et al. 1977). One may also ask whether clinical practice is being adversely affected by the lower numbers of autopsies.

In the 1970s in the United States, there was a lengthy debate over the use of autopsy rates as a test for hospital accreditation. Few facts were available, and the debate often engendered more heat than light; it was a highly subjective and sometimes emotional expression of convictions, fears and prejudices. There has been no such stimulus to debate in the United Kingdom. However, we now have figures on which to base a more rational assessment. The first major study (Heasman & Lipworth 1966) dealt mainly with mortality statistics. This was used as a model by Waldron & Vickerstaff (1976), who assessed the correlation of clinical and autopsy diagnoses in more than 1000 cases (1.7% of hospital deaths) in West Midlands and Trent; clinical diagnoses were confirmed in 47.5% of cases. In a smaller series (less than 400 cases) in Sweden, Britton (1974) found that clinical diagnoses were confirmed in 57%. This is probably the most reliable investigation to date, because the author took pains to secure good clinical consultation, and because the series was based on an exceptionally high autopsy rate – no less than 96%. A recent investigation of more than 1000 cases in Scotland was based on a lower autopsy rate (25%) but the findings were supported by close consultation between clinicians and pathologists (Cameron & McGoogan 1981a). Correlation of clinical and autopsy diagnoses were considered under two headings: (1) main diagnoses; and (2) conditions contributing to death. It was found that autopsy altered the main diagnosis in 39%, and the contributory conditions in 66% of cases. With so low an autopsy rate, it cannot be assumed that these results are representative of all hospital deaths; there is no clue to the accuracy of diagnosis in the majority of cases which do not come to autopsy. However, an attempt to obtain autopsy on all deaths from certain units (Cameron et al. 1980) achieved an autopsy rate of 65%. As might be expected, the proportion of confirmed clinical diagnoses was higher. Nevertheless, 15% of main diagnoses and 42% of diagnoses of causes of death were not confirmed at autopsy. The significance of these diagnostic discrepancies, judged jointly by the clinical consultant and the pathologist, showed that in 15% of the series there were discrepancies which were clinically significant: diagnoses which, if suspected in life, would have warranted different investigations and/or different treatment.

These figures surely challenge some of the attitudes quoted above, particularly since it was found that confirmation of clinical diagnoses was no higher in the longer-term patients than in those who died shortly after admission. Pathologists would readily accept the limitations of 'abnormal anatomy', but can we really accept that modern clinical diagnostic techniques are so 'definitive' as to be regarded as hastening the demise of the autopsy? Can a living disease process ever be 'fully documented'? Should we not always be seeking more information?

1 Based on meeting of Section of Pathology, 10 March 1981
One senior physician, who believes we should, said: ‘I cannot comprehend the lack of curiosity in clinicians who fail to follow their cases to the autopsy room’. For him, the autopsy is a completion of his clinical investigations. No diagnosis is sacrosanct and clinical confidence is not a guarantee of diagnostic accuracy. The autopsy, if intelligently used, has an important monitoring and educative role; it offers the opportunity to identify those features which led the clinician to a correct diagnosis, and those which were misleading or overlooked, and resulted in an incorrect or missed diagnosis. One must not be beguiled by the glamour of modern technology into believing that, because a diagnostic technique is modern, sophisticated and expensive, it is ‘definitive’ and therefore unchallengeable. The autopsy is not the study of ‘dead meats’, but the scientific assessment of disease processes: not, as is commonly thought, a search for the cause of death, but a systematic assessment of the course and effects of the disease, and an opportunity to review the diagnostic problems it posed. This is a study which neither clinician nor pathologist can effectively carry out in isolation; it demands mutual consultation. Such consultation requires, as a minimum, that clinician and pathologist meet to review the case as a whole – clinical evidence, laboratory and radiological findings, as well as the evidence from autopsy and subsequent histology. At its best, it calls for ‘death conferences’ at which selected cases are presented for open discussion: a practice which has had more success in North America than in this country.

One implication of these studies is that no active hospital should be content with having autopsies on only about one-quarter of its deaths. In the American debate, Murray Angevine (1974) – who incidentally did not favour the use of the autopsy in accreditation – said confidently: ‘Any professional staff with scientific curiosity will not be satisfied with such a low level of performance as 30%’. Are we no longer professional, or have we lost our scientific curiosity?

This is to a large extent in the hands of clinicians: in the UK physicians and surgeons determine whether autopsy is requested on patients who die from natural causes. Cases are selected in accordance with clinical interests or because they are intrinsically difficult or puzzling. Those in which the diagnoses are assumed to be reasonably accurate are often neglected; the clinician’s confidence or bias may ensure that some cases which most need to be examined escape autopsy. It would be unrealistic to aim for autopsies on all hospital deaths, and any attempt to introduce random selection would remove the clinician’s right to have cases of special interest examined. However, it should be possible to arrange that autopsies be carried out on a sample – say 20% – of deaths in addition to those which would be asked for in any case. This would give the clinician an opportunity to check diagnoses he may not have questioned and, in particular, to discover conditions he had not even considered: it has been referred to as a ‘partial audit’ (Cameron et al. 1980).

This would make demands on both clinician and pathologist. The clinician must be prepared to ask specific questions. Equally, the pathologist must take pains to answer them and, where appropriate, to extend his investigations beyond routine dissection and histology. Some pathologists may be less than enthusiastic about spending time on ‘routine’ hospital autopsies, and may fail to accord them the priority that their importance merits. Some, however, in inadequately staffed departments, would find that the additional workload would present real problems. When we look to the future, these problems are likely to grow, since it appears that the number of training posts is inadequate to maintain even present levels of consultant staffing (Anderson & Tighe 1980); the President of the Royal College of Pathologists has warned that, unless there is an increase in SHO and Registrar posts in pathology, there will be a serious decline in consultant services in the future (Anderson 1981). If it is accepted that this is a matter of professional standards, the means to correct it must be found (Arnott 1981).

Some may contend that difficulty in obtaining permission will block any attempt to increase autopsy numbers. The evidence suggests otherwise: some clinical units achieve a 90% autopsy rate, while others in the same geographic area are apparently content with 5% to 10%. If the will is there, it can be done.

A greater use of the autopsy could certainly make a valuable contribution to that continuing education which is claimed to be a feature of the doctor’s life. It would also have no small effect on the accuracy of death certification and hospital statistics. Both are wildly inaccurate in Scotland, yet autopsy results at present make little impact on them (Cameron & McGoogan 1981a,b). Such figures are simply unacceptable for use in research or planning.

The author’s experience is in Scotland, and it would be inappropriate to comment on the English system. It may, however not be out of place to ask two questions:

1. Why did the number of coroners’ autopsies in
England and Wales increase from 43,000 in 1949 to 145,000 in 1979 (Anderson 1981)?

(2) Why has there been a progressive increase in the autopsy rate for deaths certified by the coroner (McMahan et al. 1977) so that now it stands at about 99%? By contrast, in Scotland only about 25% of cases referred to the Procurator Fiscal come to autopsy (Mason 1979).

The purposes for which a coroner's (or a fiscal) autopsy are carried out are quite different from those of a hospital autopsy, and in England and Wales, where the major part of this work is carried out by NHS staff, this must be a considerable drain on NHS resources.

The autopsy has a variety of important roles: in teaching and research, in mortality statistics and epidemiology, and these must not be neglected. For the present, however, I have concentrated on the autopsy as a clinical investigation — the natural sequel to investigations during life. Unless clinicians and pathologists demand a more energetic and intelligent use of it, we are unlikely to change the present unsatisfactory situation.

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Microsurgery: renewed sensation

The microscope was first applied to surgery in the early part of the 20th century, when Maier & Lion (1921) undertook labyrinthine surgery in the experimental animal. In the same year Carl-Orloff Nylen (1954), a Swedish ENT surgeon, using a monocular instrument carried out fenestration in a rabbit’s ear and became the first surgeon to use the microscope in human practice on a case of chronic otitis and a few cases with pseudoistula symptoms. In the following year Nylen’s chief of surgery, Holmgren (1923), used a Zeiss stereoscopic instrument in humans and developed special operations not only for otosclerosis but also for other diseases within the temporal bone.

The use of the microscope in other surgical fields was remarkably slow to develop, it being nearly three decades before Perritt (1950), working in Chicago, recognized the potential of the microscope in ophthalmology. This potential has been fully realized in this speciality (Pierse 1974), where virtually all ocular surgery is now carried out under magnification, with dramatic improvement of prognosis. A patient’s hospital stay for cataract extraction, for example, has been reduced from approximately three weeks to three days.

It is worth considering why other branches of surgery were so slow to follow the example of ENT and ophthalmological surgeons. The natural resistance to change has been compounded in other branches of surgery by the need for magnification over a wider operative field than the restricted areas of the middle ear or the eyeball. The limited mobility and field restriction inflicted on the surgeon by a microscope require adaptive training, and great care is needed to ensure that the use of the instrument does not lead to contamination of the operative field. Various modes of prevention in this latter respect include unwieldy covers, gas sterilization of the whole instrument and meticulous cleaning combined with the use of sterile covers for moving parts. Foot controls partly overcome the need for the surgeon to handle the instruments during an operation.

The operative microscope consists of a body, a stand and a coupling arm. The stand may be of a

1 Based on paper read to Section of Surgery,
3 December 1980

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