

The role of the autopsy in medical education

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The autopsy can make an important contribution to medical education. The decline in the hospital autopsy rate threatens this role. This article examines the educational opportunities that the post-mortem still provides.

INTRODUCTION

Non-medicolegal autopsy rates in Britain have been declining for several decades (Start et al, 1993), leading to fewer opportunities for medical students and clinicians to learn from the correlation between clinical and post-mortem findings. In an era of complex diagnostic imaging and computer-assisted learning methods, the value of the post-mortem as an educational tool has been questioned (Carlidge et al, 1995; Marwick, 1995).

Despite the potentially valuable contribution that these new techniques may be able to offer, there are still many benefits for both undergraduate and postgraduate students to be obtained from attendance at post-mortem examinations.

The autopsy provides opportunities for students to learn about macroscopic and microscopic pathology, clinical pathophysiology, clinicopathological correlation, anatomy and histology. In addition, the autopsy may stimulate discussion about legal and ethical issues, death certification, quality control in medicine, and the inherent uncertainty associated with clinical diagnosis (Hill and Anderson, 1991).

EDUCATIONAL ASPECTS OF THE AUTOPSY

Anatomy is increasingly being taught using computer-assisted techniques and photographic atlases, with less reliance on the dissection of cadavers. Autopsies provide an opportunity to revise normal anatomy, and can be

particularly useful in providing a three-dimensional counterpart to the two-dimensional representations in print and multimedia resources. Attending many autopsies also demonstrates the wide variety of normal anatomy that may be encountered. Students and clinicians whose understanding of normal anatomy is based on the detailed dissection of one cadaver may not appreciate the variability between individuals in some areas of human anatomy.

CLINICOPATHOLOGICAL CORRELATION

Ideally clinicians and students from the team responsible for the clinical care of the patient should attend either the entire post-mortem or (in most cases more practically) a demonstration of the post-mortem findings. The pathological findings should be presented in a way which integrates them with the clinical features of the case, and discussion should include differential diagnoses and clinical management. Students and clinicians should have the opportunity to be shown the relevant post-mortem histology slides at a later date.

UNCERTAINTY AND THE AUTOPSY

One of the most important lessons to be learned from post-mortem examinations is the level of uncertainty inherent in much of medicine. Despite great advances in imaging and other diagnostic techniques, many studies have shown that a significant number of autopsies still demonstrate unexpected causes of death and other clinically unantic-

pated pathologies, and that these numbers do not appear to be decreasing (Kirch and Schafii, 1996).

Studies have examined the rates of significant discordance between clinical diagnoses and autopsy findings, and most show major discrepancies in between 5 and 40% of cases (McPhee, 1996).

The discordance between clinical and autopsy findings does not necessarily reflect culpability on the part of the clinicians. Uncertainty is an inescapable part of clinical medicine. It is useful for students to recognize that any diagnostic test has a sensitivity and specificity, and that any clinical opinion may be subject to error. It is difficult to demonstrate this if diagnoses are not tested against the ultimate diagnostic investigation of post-mortem examination. Despite studies highlighting the frequent discordance between clinical and post-mortem diagnoses, confirmation of a clinical diagnosis provides useful feedback to clinicians.

In addition, many post-mortems demonstrate multiple pathologies. Textbook descriptions of diseases usually present signs and symptoms in isolation from other complicating pathologies; however, in practice many patients, particularly the elderly, have more than one disease process occurring at any one time.

Witnessing such autopsies encourages students and clinicians to be aware of the frequency of multiple pathology and warns students not to become clinically blinkered in a patient with a known disorder. If the cause of death has not been clinically suspected before death, the autopsy is

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an excellent opportunity to learn lessons about an atypical presentation of the disease.

AUDIT AND ETHICS

Audit has been defined by the Department of Health as:

'the systematic critical analysis of the quality of clinical care including the procedures used for diagnosis and treatment, the resources used and the resulting outcome and quality of life for the patient' (Royal College of Pathologists, 1997).

By continuously auditing discrepancies in diagnosis discovered at post-mortem examination and feeding back the results to clinicians, preferably with regular autopsy review meetings, the value of audit and the benefits of a constructive audit cycle can be effectively communicated to students and staff.

Medical student attendance at autopsies can provide an opportunity to discuss ethical and legal aspects related to death, such as death certification, the role of the coroner, and the differences between the hospital and coroner's autopsies. Such issues should also be covered in the formal curriculum, but ad hoc discussion of these subjects as they relate to an individual autopsy can provide useful reinforcement.

PROBLEMS WITH USING AUTOPSIES IN MEDICAL EDUCATION

A survey of doctors involved in teaching pathology to medical students reported five main problems in the use of the autopsy as a tool for medical education (Hill and Anderson, 1991):

1. Insufficient time in the pathology course
2. Competing departmental and professional responsibilities
3. Departmental inertia or disinterest
4. Logistics
5. Insufficient numbers of autopsies.

These problems make it impractical in most departments for pathology teaching to be solely based on autopsy experience; however, there are few

good reasons why attendance at autopsies can not be incorporated as an integral part of the clinical experience of students. Obviously it is not possible to guarantee a cardiac death to fit neatly into an autopsy slot in a cardiac teaching module, and even if a student regularly attends autopsies there is no guarantee that every major pathology will be witnessed.

Such concerns do not prevent medical student teaching in other branches of medicine, and it is generally accepted that clinical training in any department is based around the patients that are available at the time. There is no reason why autopsy-based pathology teaching should be abandoned because it is no more comprehensive than hands-on medicine or surgery teaching. In addition, the use of fixed museum specimens, photographs, and computer-based autopsy database collections can be used to supplement student's personal autopsy experience.

Another potential problem may be the reluctance of some medical students to attend autopsies. Although many medical students in Britain do not regularly attend autopsies, a survey of medical students at University College Hospital London and St George's Hospital showed that, of those medical students who had attended post-mortems, over 86% felt that they were a useful educational experience (Galloway and Galloway, 1999).

It is also clear, however, that some students find the autopsy a distressing experience (Benbow, 1990). It can be easy for pathologists and mortuary staff who are used to dealing with the dead to forget that an autopsy may be one of the first encounters a student has with death, and that the student may have been involved in the ante-mortem care of the patient.

To minimize the shock of a student's first autopsy attendance, adequate provision should be made early in the curriculum for learning about the purpose of the autopsy, and about how the procedure is performed. Consideration should also be given to providing students with an opportu-

nity to discuss their reactions after their first autopsy, and counselling facilities may be needed for some students who feel particularly affected by the experience.

Some medical students qualify without ever having witnessed a post-mortem examination. It is generally junior doctors who, in practice, are expected to request consent from relatives for hospital post-mortem examinations. A study in Sheffield showed that the majority of coroner's and hospital post-mortem requests are made by house officers and senior house officers (Start et al, 1996b).

There is a risk that doctors who have no personal experience of autopsies may not request post-mortems because of a lack of understanding of the role of the post-mortem, and the information that they provide to relatives about the procedure may be unintentionally misleading.

Following recent public concern regarding the procedures for obtaining informed consent for the autopsy and the subsequent retention of tissues for further examination, doctors requesting consent for an autopsy are in an unclear legal and ethical position. Clarification over these issues is urgently needed; however, relatives need to be clear that in some cases retention of tissues is diagnostically essential (Lucas, 1999).

Other commitments may make it difficult for clinicians to attend post-mortem demonstrations. Those responsible for organizing postgraduate clinical training need to be aware of the importance of learning from patients at autopsy. Attendance at educational events is becoming an accepted right and responsibility of all clinicians in training, and various schemes such as bleep-free teaching periods have worked well at many hospitals for a variety of educational programmes. Autopsy-based teaching should be included within such programmes.

Finally, students need to be trained in the communications skills necessary to discuss post-mortem procedures so that requests for post-mortems from bereaved relatives are handled sensitively (Start et al,

1996a). Time in the medical school curriculum should be devoted to issues surrounding death, including the autopsy, the role of the coroner, transplantation, death certification, bereavement and the relevant communication skills.

NEW TECHNOLOGIES FOR AUTOPSY TEACHING

The use of a still video camera for recording and disseminating autopsy information has been explored by a team in Cardiff (Hunt et al, 1997) who report a high level of acceptance by students. A team in Aberdeen have explored the use of ISDN-linked teleconferencing to allow interactive telepathology teaching of students in the United Arab Emirates (Brebner et al, 1997). A variety of other imaging techniques may be equally appropriate in different settings.

An advantage of capturing and storing autopsy images is that meetings with students can be arranged for mutually convenient times, and if possible shown in conjunction with histological images. Such techniques may help overcome potential health and safety objections to the presence of large numbers of students in a post-mortem suite, and logistical problems associated with the unpredictable timing of autopsies. With the increasing affordability of digital imaging and recordable compact and digital versatile disc facilities it is possible for students could keep a disc relating to the patients they have followed, ideally from clinical presentation to post-mortem, including clinical histories, radiographs, macroscopic pathology and histology.

These new methods of teaching have the potential to augment the value of the autopsy in medical education, but can be expensive in terms of start-up costs and require a substantial time investment from the pathologists involved. These new techniques should not be seen as devaluing first-hand autopsy experience, which provides a more immediate, interactive and three-dimensional learning tool.

CONCLUSIONS

This article has examined some of the educational opportunities provided by the autopsy, and has explored some of the problems associated with autopsy-based learning. By making the autopsy an integral part of undergraduate and postgraduate medical education, patient care may ultimately be improved. However, this opportunity is threatened by the decline in the non-medicolegal post-mortem rate. **HM**

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KEY POINTS

- The autopsy is a valuable resource for both undergraduate and postgraduate medical education.
- New technologies may augment the educational value of the autopsy but should not be seen as a replacement for traditional autopsy-based teaching.
- If autopsy rates continue to decline an important component of medical education may be undermined.