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Digital photography and the autopsy

As a proponent of digital photography I am gratified to see it being increasingly used by pathologists. Here Gary Rushton and Graham Russell make the case for its use in the post-mortem room.

Introduction

The total number of autopsies performed in the United Kingdom has gradually fallen. Currently, most autopsies are medico-legal cases performed for the coroner. The consented hospital autopsy has effectively become extinct in many institutions. As a result, the opportunity to retain organs and tissue for histology at the time of the autopsy has also declined. The fall in autopsy histology was confirmed in the recent NCEPOD publication, *The coroner's autopsy: do we deserve better?*¹

Histology is an important part of the autopsy process. In most cases, it will provide a more accurate cause of death than macroscopic observation alone, leading to better death certification and epidemiological statistics. Histology also produces an important permanent record of the autopsy findings and can be used for teaching and audit to ensure that high quality standards of clinical and autopsy practice are maintained. Indeed, best-practice autopsy guidelines from The Royal College of Pathologists state that "sampling of all the major organs is recommended for all autopsies".²

The introduction of the Human Tissue Act 2004 has understandably tightened the laws governing tissue removal, retention and use. However, the increased bureaucracy and complicated issues that surround consent all impact on autopsy histology practice and may contribute further to the decline of the hospital autopsy. In addition, autopsy histology is influenced by regional variation in coroners' practice following implementation of the

Coroner's Rules Amendments 2005. This disparity was highlighted in a recent article by Delaney and Roberts,³ with the authors concluding that "these variations have potentially important implications for clinical practice".

Clinicians are already largely apathetic when it comes to the hospital autopsy. However, a doctor has a level of duty to a patient in death comparable to that in life and as pathologists it is our duty to convey the importance of the autopsy to our clinical colleagues. We must provide guidance on issues surrounding consent and improve the potential value of the autopsy with timely reports and good clinico-pathological correlation. The use of photographs in an autopsy report showing the relevant gross pathology can provide a permanent record of the autopsy findings in the absence of autopsy histology. Photographs may also help to address the inconvenience and unpleasantness that many clinicians express about visiting the mortuary to view the findings of the examination.

Photography, medicine and death

The use of photography in clinical medicine has been increasing for many years. Numerous applications have been identified, with its use in endoscopy, colposcopy, dermatology and ophthalmoscopy being good examples. Photographic images can also be used for teaching purposes.

Photography is now increasingly employed in routine daily pathology practice in most cut-up rooms, producing high quality digital images of macroscopic specimens. This provides a permanent record of the case long after disposal of the specimen and produces images that can be shown at multidisciplinary team meetings to aid clinical understanding. The images can be used to indicate the sites of tissue sampling or the extent of disease and thus form part of the final pathology report. Photography has an important role in forensic and medico-legal autopsy practice, providing a permanent pictorial record of evidence.

Photography's association with death can be traced back to the late 19th century. This original technology was enthusiastically embraced by late Victorian England and meant that family pictures were available for the masses. It did not take the

Figure 1: Alcoholic liver cirrhosis



Figure 2: An acute myocardial infarct identified by pallor and haemorrhage of the myocardium



Figure 3: The thrombosed coronary artery that caused the myocardial infarct shown in Figure 2



Victorians long, however, to discover a novel use for photography, namely photographing the dead to produce a memento of the deceased.⁴ By today's standards, except in the obstetric and paediatric setting, regularly photographing the dead seems rather macabre but was accepted common practice in the late 19th and early 20th centuries.

Practical autopsy photography

Like the early Victorians, who understood the value of a permanent photographic record at the time of death, pathologists recognise and appreciate the similar function performed by autopsy histology. In the absence of retained histology, photography can be utilised to produce a permanent visual record of the autopsy findings and the images archived in the medical records of the deceased. Although it is said that a picture can paint a thousand words, photography can only partly substitute for the documentary function of histology, not its value in microscopic diagnosis.

Photography can also act as a supplementary teaching aid. In pathology, the macroscopic images of the many different disease examples identified at autopsy can be used to educate medical students and pathology trainees, particularly those trainees in areas where it is difficult to gain adequate autopsy experience. Again, it must be emphasised that photography cannot and should not replace the unique experiences and knowledge obtained in the autopsy suite that are developed using other sensory modalities, such as touch and in some cases smell!

The cost of a good-quality digital camera has fallen considerably and the cameras are very light-

weight and simple to use. Most have a 'macro' mode with automatic adjustment for light conditions and are capable of producing high-quality images. The images can be rapidly downloaded and stored on computer and readily accessed when needed.

As far as possible, the organ, tissue slice or image field should be dried and cleaned in order to eliminate light reflection and improve the overall quality of the photograph. We have found that organs or tissue slices placed and photographed on a dark, contrasting background produce crisp images. We use green scouring pads as a background, they are ubiquitous, cheap, disposable and do not show damp seepage. The inclusion of some form of measurement scale within the image for size validation is recommended.

For health and safety reasons, some care and thought when using the camera is required in order to prevent contamination of the equipment (and the operator!). One recommendation that works well in our practice is the use of two pairs of gloves. The outer dirty gloves are removed to leave clean gloved hands underneath that can then be used to handle the camera and take the photograph. Alternatively, a willing mortuary assistant can be invaluable. Camera stands and remote foot controlled operation pedals are available and may be of use.

Confidentiality and consent

The correct identification of an image is best achieved by placing a label bearing the autopsy number within the photographic field of view before capturing the image. Using the deceased's name to identify an image should be avoided at all times. All images should then be transferred to computer as soon as practicable, in an anonymised format. Storage of the images on one computer, perhaps in the mortuary, is preferable for security and practical reasons. The images should also be backed up on a central server or on encrypted or password-protected computer discs to reduce the risk of losing valuable data. The camera memory card should then be cleared and the camera charged so that it is ready for subsequent use. It is advisable to store the camera securely in the mortuary so that it is always available.

The General Medical Council (GMC), British Medical Association and Institute of Medical Illustrators have all issued guidelines and recommendations regarding consent and its implications surrounding audio and visual recordings.⁵⁻⁷ These documents also provide additional useful advice and references. The guidelines issued by the GMC say that "permission is not required to make recordings (defined as originals or copies of video and audio recordings, photographs and other visual images of patients) of internal organs" nor obtain "consent to use them for any purpose, provided that, before use, the recordings are effectively anonymised". The guidance states that "when

Figure 4: Fatty infiltration of the right and left ventricles in a case of arrhythmogenic right ventricular cardiomyopathy



Figure 5: A characteristic wedge shaped splenic infarct

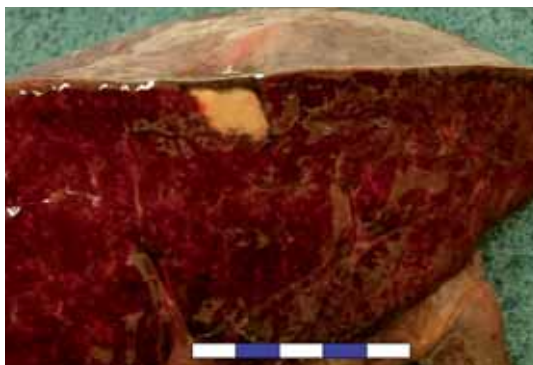


Figure 6: Laryngeal petechiae as a result of suicidal hanging



conducting a hospital post-mortem examination, you must seek permission from a close relative or carer before making any recording from which the deceased may be identifiable". It continues: "if the death is the subject of a medico-legal investigation, the proposed recording should be discussed with the coroner or Procurator Fiscal (in Scotland) who has authorised the investigation". Where consent is granted, it is probably best practice to document this in the autopsy report.

Conclusion

The gradual changes in autopsy practice and other influencing factors have reduced the quantity of histology taken at autopsy over the past few years. This is likely to have severe implications for training, subsequent case review and the overall quality of autopsy practice. Although not a substitute for histology, digital photography can address some of these problems by providing a permanent visual record of the autopsy findings. In addition, the use of photographs in autopsy reports may add value to the autopsy process for clinicians and encourage them to ask for more hospital autopsies. Clearly, the use of digital photography at autopsy should be actively encouraged in all mortuary suites.

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