Computed tomogram of the thorax showing aneurysmal dilatation of the thoracic aorta containing thrombus.

aortography as a false aneurysm of the aortic arch which had originated at the left subclavian artery.

At thoracotomy an apparent hole in the aorta was oversewn with removal of slough from a false aneurysmal cavity adjacent to the upper lobe of the left lung. Cultures from pericardial tissue, the wound drain, and stools grew *Salmonella enteritidis*. He was given intravenous ampicillin 2 g four times a day. While apparently recovering, he suddenly collapsed and died 18 days after surgery from a massive haemoptysis. At necropsy it was impossible to identify the source of blood loss. The left lung contained a ragged cavity partly lined with thrombus in its upper lobe, with no evidence of vascular patency into this area. There was a small true aneurysm between the left carotid and subclavian ostia where a suture line was intact. The aorta showed moderate to severe atherosclerosis.

Although *Salmonella* thoracic aortitis is rare,¹ salmonellas have been incriminated in 18–35% of infected aneurysms.^{2,3} The elderly are particularly liable to the complications of salmonella bacteraemia, with 25% developing an endothelial infection.⁴ Clinical presentation may be with chronic sepsis unresponsive to antibiotics,³ or with features of a primary focus, such as osteomyelitis.

Alternatively, the symptoms may relate to the presence of an aneurysm or its rupture. Frequently there may be no such signs, even after rupture.³ A review of 34 cases of infected aortic aneurysms reported fever in all cases, positive blood cultures in 53%, and preoperative rupture in 79%. In 73% of cases the

patient was over 60 years old.³

The tendency for Gram negative infections to progress rapidly and rupture² makes urgent surgery imperative following diagnosis. If not treated surgically, mycotic aneurysms are invariably fatal.⁵ Successful management requires prompt diagnosis, appropriate antibiotics based on culture sensitivities, and intraoperative Gram stain with culture of the aorta and contents. Wide resection of infected tissue is necessary, with extra-anatomic grafting through clean tissue planes.² Cholecystectomy has been advocated if *Salmonella* is identified preoperatively, as the biliary tree is often a sanctuary for organisms and for continued sepsis.⁵

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- 1 Cooper CB, Flinn J. *Salmonella* typhimurium and rupture of the thoracic aorta. *Thorax* 1987;42:391–2.
- 2 Jarrett F, Darling RC, Mundth ED, Austen G. Experience with infected aneurysms of the abdominal aorta. *Archives of Surgery* 1975; 110:1281–6.
- 3 Bennett DE, Cherry JK. Bacterial infection of aortic aneurysms—a clinical pathological study. *Am J Surg* 1967;113:321–6.
- 4 Cohen PS, O'Brien TF, Schoenbaum SC, Medeiros AA. The risk of endothelial infection in adults with salmonella bacteraemia. *Ann Intern Med* 1978;89:931–2.
- 5 Ewart JM, Burke ML, Bunt TJ. Spontaneous abdominal aortic infections. Essentials of diagnosis and management. *Am Surg* 1983; 49:37–50.

is indeed worthy of discussion.² The true incidence of these accidents, however, is and probably always will be impossible to assess. Not all cases are diagnosed, nor are they reported: it seems remarkable that not one case of peritoneal metastasis after needle biopsy has even been reported. The variability of survival is also of great importance: 20% of the reported subcutaneous metastases are detected after four years or more.²

Good indications of the true incidence were given by Smith,³ who showed that the actual risks of metastasis after needling were very low (of the order of 0.5/10 000). Bleeding and sepsis after needle biopsy are at least 10 times more common than metastasis.

Puzzled by the question of the number of metastases and being unable to obtain a satisfactory scientific answer, we thought it more relevant to examine the circumstances in which they occurred and found that the occurrence of metastasis seemed to be associated with large needles, core biopsy devices, high numbers of passes, and absence of normal parenchyma covering the tumour.²

Accordingly, we evolved a golden rule for needle biopsy: one pass with a fine needle (22 gauge or larger) through normal parenchyma.² This seems to be well advised because we were unable to find any report of metastasis in such circumstances.

When it can be calculated, the risk of metastasis seems to grow exponentially—for instance, increasing the needle diameter by a factor of two increased the seeding by a factor of 60² (without improving diagnostic efficiency).^{4–6}

In our opinion *good practice* is that needle biopsies of solid masses should be performed by (i) trained teams, (ii) only when taking decisions about the patient's management, (iii) through normal parenchyma, whenever possible, respecting anatomical boundaries, (iv) always with a fine non-cutting needle, (v) the sampling has to be done under suction, which must be maintained when withdrawing the needle, (vi) the sample quality has to be checked later to keep the number of passes to the very minimum.

In our opinion the case² referred to accumulated risk factors, and should, in no way, be used to affirm that the rate of metastasis after needle biopsy, and especially fine needle aspiration, is higher than is usually thought. It could serve, instead, to emphasise the risk factors and how they can be avoided. Large cutting needles, in particular, should not be used when cancer is suspected.

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- 1 Denton KJ, Cotton DWK, Nakielnny RA, Goepel JR. Secondary tumour deposits in needle biopsy tracks: an underestimated risk? *J Clin Pathol* 1990;43:83.
- 2 Roussel F, Dalion J, Benozio M. The risk of tumoral seeding in needle biopsies. *Acta Cytol* 1989;6:936–9.
- 3 Smith EH. The hazards of fine needle aspiration biopsy. *Ultrasound Med Biol* 1984;10:629–34.
- 4 Bedenne L, Mottot C, Courtois B, et al. L'aiguille Tru-Cut est-elle plus efficace que l'aiguille fine dans le diagnostic des lésions hépatiques? Etude comparative de 45 ponctions guidées par l'échographie. *Gastroenterol Clin Biol* 1990;14:62–6.
- 5 Roussel F, Genevois A, Lestrat JP, Benozio M. Ultrasound guided FNAC in pancreatic masses: interest of co-performing by radiologist and cytopathologist. *Acta Cytol* (in press).
- 6 Cochand Priollet B, Chagnon S, Ferrand J, Blery M, Hoang C, Galian A. Comparison of cytologic examination of smears and histologic examination of tissue cores obtained by fine needle aspiration biopsy of the liver. *Acta Cytol* 1987;31:476–80.

Drs Denton and Cotton comment:

We are grateful to Dr Roussel for his comments, and we agree with several points, including his assessment of risk factors.

While it is true that most of the measures given should reduce the risk of needle track metastasis, we would dispute his suggestion of maintaining suction while withdrawing the

MATTERS ARISING

Risk of metastasis during fine needle aspiration

Denton *et al* expressed the opinion that there is a systematic underestimation of the risk of metastasis during needle biopsy.¹ This topic

needle. Numerous well recognised texts state that this causes loss of the aspirate into the body of the syringe, after which the aspirate will have to be repeated.¹

Metastasis to the track remains one of the rarer complications of needle biopsy or aspiration, but without further observation the effectiveness, or otherwise, of measures to reduce the risk will remain uncertain.

- 1 Melcher D, Lindan J, Smith R. *Practical aspiration cytology*. London: Churchill Livingstone, 1984.

Histomorphometry and immunohistochemistry of beef sausages

On reading the letter by Dr Boon concerning histological studies of beef sausages,¹ it occurs to me that, in view of the culinary nature of the specimens, microwave fixation might afford optimal results. Perhaps he should consider a collaborative study with his namesake, Dr ME Boon,² an authority on this technique.

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- 1 Boon AP. Histomorphometry and immunohistochemistry of beef sausages. *J Clin Pathol* 1990;43:435.
2 Boon ME, Kok LP. *Microwave cookbook of pathology: The art of microscopic visualisation*. Leiden: Coulomb Press, 1987:84-92.

Use of Tipp-Ex for surgical resection margins

We would like to draw attention to the recent letter¹ in which Tipp-Ex fluid was recommended as a convenient marker for surgical resection margins. Dr Harris has been "economical with the truth" in stating that processing equipment is "unaffected" by Tipp-Ex fluid. We have found that Tipp-Ex fluid rapidly blunts microtome knives. In the interests of economy and laboratory harmony we would like to set the matter straight.

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- 1 Harris MD. Tipp-Ex fluid: convenient marker for surgical resection margins. *J Clin Pathol* 1990;43:346.

BOOK REVIEWS

Exercises in Ultrastructural Pathology. Ed M Sobrinho-Simoes. JM Nesland, JV Johannessen. (Pp 227; £45.) Taylor & Francis. 1990. ISBN 1-56032-017-6.

This is a most unusual book, the stated aim of which is to allow pathologists to test their skills at interpreting ultrastructural appearances. Thirty cases are set out individually with a brief clinical history and, initially, a single "diagnostic" electron

photomicrograph. A set of questions are posed and then the authors go through the light microscopic and ultrastructural features of the lesion in question, providing further illustrations (all in black and white) to back up their diagnoses. The 30 cases presented comprise 24 tumours, three forms of glomerulonephritis, two storage diseases, and one case which covers two different viral infections. This is probably a fair reflection of the distribution of diagnostic electron microscopy in most laboratories. Of the tumours, however, there is rather undue bias on neuroendocrine neoplasms (which are pretty repetitively ultrastructurally) and on sarcomas. The quality of pictures throughout is perfectly acceptable, although not stunning. The explanatory descriptions and clinicopathological discussion of each case are of good quality, if a little unimaginative. In more than half the cases the authors admit that the diagnosis could have been readily reached without resorting to electron microscopy which rather detracts from their claims about the value of this technique. Given the inevitably idiosyncratic choice of cases in a book of this type, it is hard to imagine the type of individual who might purchase it. Nevertheless, candidates frightened of being shown electron microscopy in the final MRCPPath might find this a useful and informal text to flip through at the last minute.

CDM FLETCHER

Hospital-Acquired Infection. Principles and Prevention. 2nd ed. GAJ Ayliffe, BJ Collins, CJ Taylor. (Pp 140; soft cover £12.95.) Butterworths. 1990. ISBN 0-723-61259-5.

The authors of this very useful and popular book are recognised experts in the field, and the text reflects their long experience and essentially practical approach. The reader seeking a comment on just about any aspect of hospital infection will find it here (although the search for it may not always be easy). The book suffers somewhat from the authors' attempt to address both a specialist and a non-specialist audience, which leads to certain sections containing statements which may be inadequate for the former and probably mystifying to the latter. There are also some instances where more positive or less ambiguous statements would be helpful, and certain sections would benefit from being amplified at the expense of others which are unnecessarily wordy and repetitive. I hope there will be a third edition and that the opportunity will be taken to convert what is already a good book into the excellent one that it could be.

DM HARRIS

Nucleic Acid Probes. A Primer for Pathologists. Margaret A Piper, Elizabeth R Unger. (Pp 174; soft cover \$35.50.) Raven Press. 1989. ISBN 0-89189-283-4.

This is a timely, inexpensive, and highly readable paperback that is potentially of value to workers in all pathology subspecialties. In the first chapter the authors give a simple outline of nucleic acid chemistry and cell biology and the second chapter is devoted to the general principles of practical procedures including Southern blot and in-situ hybridisation and the polymerase chain reaction. Naturally, given its length, this is not a bench book but, as the pun in the title suggests, a gentle and well illustrated introduction. The

brief section on restriction fragment length polymorphism analysis would be easily understood by undergraduates. The third chapter considers diagnostic applications with emphasis on leukaemia, lymphoma, and genetic disease. This reviewer now knows a lot more about T cell gene rearrangements, and reading about them was a pleasure.

At the end of the book there is a very useful glossary of technical terms and quite an extensive bibliography comprised predominantly of 1987 and 1988 references. I highly recommend this book.

M WELLS

Ehrlichiosis. Ed JC Williams, I Kakoma. (Pp 164; £45.) Kluwer Academic Publishers. 1990. ISBN 0-7920-0691-0.

Ehrlichiae are small pleomorphic obligate intracellular micro-organisms belonging to the family Rickettsiaceae and can cause infection in both humans and animals, notably dogs. The book is based on a symposium in Washington: DC in 1988 but has been updated to include more recent data from experts on Ehrlichiae and related pathogens. The first of 13 chapters is an account of the historical background and global importance of ehrlichiosis and is followed by chapters on their cultivation, structure, biological properties, and pathophysiology. Chapter nine describes human ehrlichiosis in the USA after which there are discussions on the evolutionary history of chlamydiae, research on cowdriosis (heartwater disease in cattle), and current strategies in research on ehrlichiosis. The last chapter is an epilogue which provides a useful summing up of the contents of this undoubtedly comprehensive and authoritative account of the subject. Nevertheless, I doubt whether this book will be useful to pathologists in hospitals in northern Europe, but it may interest our veterinary colleagues and those in warmer climates.

RN PEEL

NOTICES

Mediastinal tumours—Pandora's Box

National Heart & Lung Institute
In association with
Royal Brompton & National Heart
Hospital, London

3-4 December, 1990

A two day symposium designed for radiologists, respiratory physicians, surgeons, oncologists and pathologists, but should be of interest to others involved in the field of thoracic medicine. Topics will include thymomas, lymphomas, germ cell, neural endocrine and rarer connective tissue tumours. An emphasis will be made on imaging and therapy.

Further details are available from:
Postgraduate Education Centre
National Heart & Lung Institute
Dovehouse Street, London SW3 6LY
Direct telephone: 071-351 8172 (24 hrs)
Facsimile: 071-376 3442