Mature renal teratoma and a synchronous malignant neuroepithelial tumour of the ipsilateral adrenal gland

The main primary childhood renal neoplasms are nephroblastoma, mesoblastic nephroma, clear cell sarcoma, and rhabdoid tumour. Other primary renal neoplasms include primitive neuroectodermal tumour (PNET), renal cell carcinoma, and angiomyolipoma. Nephroblastoma is the most common renal tumour in children. It is a complex embryonal tumour of metanephric blastemal derivation, which often contains diverse epithelial and stromal tissues. Diagnostic problems are often encountered when tumours contain a variety of heterologous elements. The term teratoid nephroblastoma has been used to describe a variant of nephroblastoma with a predominance of heterologous tissues. It is this variant that can be confused with a teratoma. Renal teratomas are rare and most have been dismissed as cases of teratoid nephroblastomas or retroperitoneal teratomas secondarily invading the kidney. The differentiation between these two neoplasms in the kidney is often problematic.

Neurogenic tissues in the kidney can be found in primary tumours or as part of metastatic tumours. The primary tumours are nephroblastoma, which may contain ganglion cells, neuroblast, and neuroglial tissue, and PNET. Adrenal neuroblastomas can directly invade the adjacent kidney. We describe the pathology of a right renal mass in a 3 year old child and discuss the differential diagnosis.

A 3 year old girl presented with abdominal pain and diarrhoea. On examination she was found to have signs of pulmonary tuberculosiis and was started on antituberculous treatment. Subsequently, a large, firm, tender, right flank mass clearly separate from the liver was detected and she was referred to the Regional Paediatric Surgical Unit for further investigation and management.

On admission, the child was apyrexial, emaciated, and weighed 13 kg. She had bilateral coarse cracksles and a wheeze. The abdomen was distended and a non-tender 3 cm hepatomegaly was palpated. Furthermore, a 10 x 12 cm non-tender, firm, non-pulsatile right flank mass was detected.

Results of routine laboratory tests were as follows: haemoglobin, 90 g/litre (normal, 112–143); white blood cell count, 8.2 x 10^9/litre (normal, 5.5–15.5); and platelet count, 224 x 10^9/litre. Urinary catecholamine values were as follows: noradrenaline, 0.279 µM/mM creatinine (CRT) (normal, 0–0.035); dopamine, 0.67 µM/mM CRT (normal, 0–0.035); and homovanillic acid, 11 µM/mM CRT (normal, 0–0.035); dopamine, 0.67 µM/mM CRT (normal, 0–0.035); and homovanillic acid, 11 µM/mM CRT (normal, 0–0.035); dopamine, 0.67 µM/mM CRT (normal, 0–0.035); and homovanillic acid, 11 µM/mM CRT (normal, 0–0.035). Renal and liver function tests were normal.

Computed tomography (CT) scan of the abdomen revealed a large tumour involving the right side of the abdomen. There were also multiple hepatic lesions consistent with metastases. A fine needle aspiration biopsy of the mass was performed. After a cytological diagnosis of neuroblastoma the child was started on the appropriate chemotherapy protocol consisting of vincristine, actinomycin, cyclophosphamide, and adriamycin. She suffered seizures while on chemotherapy, which was subsequently decreased to 75% dosage. A CT scan of the brain was normal.

The child died two weeks after commencement of chemotherapy. A necropsy was performed.

Necropsy revealed an enlarged right kidney measuring 16 x 10 x 8 cm and weighing 1200 g. There was a well demarcated tumour mass in the upper pole of the kidney, which measured 7 x 6.5 x 5 cm (fig 1). The upper pole mass was encapsulated (fig 1; arrows), predominantly firm in consistency, and had yellow and white areas. There was a small area of soft, friable tumour present within the mass, close to the junction of the adjacent kidney. On the capsular surface the upper pole mass was clearly demarcated from the remaining kidney. It was not possible to recognise normal renal tissue because the remaining kidney was diffusely swollen, pale, soft and contained focal areas of necrosis (fig 1). The right adrenal gland was not identified despite serial sectioning. There was extension of the tumour into the right renal vein and inferior vena cava. Tumour spread into the ureter was also seen. There were multiple, greatly enlarged para-aortic lymph nodes containing metastatic tumour. Metastatic tumour deposits were present in the liver, vertebrae, and both lungs. In addition, caseous nodules were identified in the lungs and hilar lymph nodes. The left kidney and adrenal gland were normal. The rest of the postmortem examination was normal.

Histological examination of the well demarcated upper pole mass showed a tumour composed of multiple heterologous tissue elements. Tissues derived from all three germ layers—ectoderm, mesoderm, and endoderm—were present. The yellow areas corresponded to mature adipose tissue microscopically. In addition, striated muscle, smooth muscle, and fibrous tissue were present, as were small islands of neuralgial tissue. The epithelial component was variable and consisted of small tubular structures lined by cuboidal epithelial cells with clear cytoplasm. Also present were larger cystic structures lined by respiratory epithelium. Adherent to these cysts were small closely packed acini composed of mucin containing epithelium. A prominent feature was the presence of several cysts lined by keratinising stratified squamous epithelium with hair follicles and hair shafts (fig 2). Small round tumour cells diffusely infiltrated the remaining kidney. These were arranged predominantly in solid sheets, but focal neuroectodermal canals and rosettes were also identified (fig 3). In addition, there was microscopic evidence of metastases in the lungs, liver, ovaries, and vertebrae. The metastatic tumour in all sites consisted of the primitive small, round cell component. Sections taken from the region of the right adrenal gland showed a diffuse infiltrate of small round blue cells, but no residual adrenal gland tissue was identified. There were no nephrogenic rests in the kidney.

A panel of immunohistochemical stains was performed on the small cell malignant tumour to detect cytokeratins (AE1/AE3, CAM5.2), synaptophysin, neurone specific enolase (NSE), chromogranin, WTI, desmin, muscle specific actin, S100 protein, glial fibrillary acidic protein, O13, leucocyte common antigen, and epithelial membrane antigen. The small round cells showed immunoreactivity for NSE, synaptophysin, and chromogranin. The cells were non-reactive for the remaining markers. Histology confirmed tuberculosis of the lungs and lymph nodes. Acid fast bacilli were identified.

To diagnose a renal teratoma, the primary tumour should be unequivocally of renal origin and the tumour should exhibit unequivocal heterotopic organogenesis clearly recognised as evidence of attempts to form organs other than the kidney. It is the second criterion that often presents a problem. The question is: what constitutes unequivocal organogenesis? The presence of bone, cartilage, muscle, fat, nephrogenic tissue, and mature epithelium cannot on their own be regarded as...
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termediate, because the mature teratoma was well
composed of both neural and non-neural elements. First, it might be a primitive
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the cost effectiveness of a practice for which there is no current grade A recommendations.

The important issue that Dr Murphy raises relates to why thrombophilia tests are performed; are they to explain why an individual develops thrombosis or are they to optimise clinical decisions? In other words, are they for the sake of science or medicine. If testing is performed to explain why an individual develops thrombosis then the discriminate approach suggested by the 1990 guidelines quoted by Dr Murphy will increase the proportion of tested patients who are found to have a laboratory abnormality. However, if testing is performed to optimise clinical decisions then there is no rational basis for such a recommendation given the data that are currently available. There is no evidence that the predictive value of thrombophilia testing is any way superior in the categories of patients outlined above to that in other patients with venous thromboembolism. For example, a patient with a first event after the age of 45 years in the absence of a family history might still be at risk of recurrence in the future. Therefore, the issue is whether testing patients with venous thromboembolism for laboratory evidence of thrombophilia has predictive value. The presence of a raised titre of antinuclear antibodies indicates a higher risk of early recurrence and therefore might be considered an indication for continued anticoagulation (grade B). Because lupus anticoagulant activity is also indicative of antiphospholipid activity it might also be considered an indication for continued anticoagulation. The predictive value of testing for heritable thrombophilia might be better in patients with homozgyous or combined heterozygous defects (grade B). In my own practice I find testing valuable for assessing risk in family members, particularly females patients who are considering pregnancy or oestrogen/progestagen contraceptive pill use. If a thrombophilic defect has been detected in the symptomatic index family member then that specific defect can be looked for in the relatives who are requesting counselling. This obviates the need for an expensive comprehensive screen in all of the family members and avoids confusion as to whether an abnormal result is relevant or not.

Like all clinicians responsible for the judicious use of scarce health care resources Dr Murphy has to decide whether thrombophilia test results influence his clinical practice. If they don’t then there is no necessity to do them.

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Book reviews

Illustrated Pathology of the Spleen. Wilkins E, Wright D. 1996. 0 521 62227 2. Illustrated Pathology of the Spleen by Bridget Wilkins and Dennis Wright is a beautiful book. It is a pleasure to hold it and browse through it because of its size, layout, and the quality of the print and figures. But that is only the exterior. At least equally important is the contents. These match the style.

The authors aim with this book to demystify the spleen by putting forward a systematic, analytical approach to the interpretation of splenic pathology. The authors succeed by using numerous illustrations and the book is indeed a combination of an atlas and a textbook.

The book is well written and very readable. Most textbooks are reference works where one can look up a specific problem. This book is also a guide. The problem with splenic pathology is where to start, what to look for. The first two chapters ("Introduction" and "Normal structure, development and functions of the spleen") serve as a firm basis on which the approach to the study of splenectomy specimens is built. The last chapter ("Summary: some key points in splenic differential diagnosis") provides an easy approach for some common situations. These three chapters include about 50 pages of text and illustrations and the evening it will cost studying them is a worthwhile investment. The other chapters deal with the disorders expected in the spleen, such as haematopoietic and infectious diseases, but there is also a chapter on post-traumatic and incidentally removed spleens, illustrating the practical approach of the authors.

Are there no complaints? Of course there are a few points that can be made. Not all of the illustrations are perfect; for instance, splenic marginal zone lymphoma, a difficult to recognise lymphoma is not very well illustrated, especially the important low power figures, which is not very informative. The references are well chosen, run into 1998, but the number is rather low. The importance of plasmacytosis ("splenitis") is not described. Nevertheless, the value of the book clearly outweighs these remarks and the book is recommended for each practising pathologist who occasionally is confronted with splenic pathology and feels uncomfortable when there is histology that does not look familiar.

A VARGAS


This book is volume 126 in the "Contributions to nephrology" series. Its stated purpose is to review the author’s work on IgA nephropathy and to provide the most up to date findings on the subject. The first of these aims is certainly achieved, but in providing a broad up to date review it is sadly lacking. As a result of focusing on the author’s own work, the text is unbalanced with many important omissions. The reference list is relatively short for a book of this length (274, compared with 711 for the IgA chapter in Henprett’s Pathology of the Kidney) and is out of date in several areas.

The chapters that are potentially of most interest to pathologists are those on histopathology, pathogenesis, and mechanisms of progression. The first of these is a brief eight pages. The introduction to light microscopy (LM) strangely includes a huge page summarising a study that reported the absence of DNA polymerase-α positive cells in IgA nephropathy. Hoping that the next section, on LM classification of IgA nephropathy, would make sense of what is currently a confused area, I was disappointed to find that only three systems were discussed, all from Japan (Shirai’s, Sakaguchi’s, and Sakai’s), with no attempt to rationalise disparate schema or to differentiate disease activity from chronicity. The chapters on pathogenesis improve on this poor start, but again are eratic; in some areas, such as alterations in glomerular filtration, it tabulates large amounts of raw data, while omitting other important pieces of recent work. As a result, it is unlikely to satisfy researchers in this field.

Although nephrologists might find some useful information in this book, pathologists will find it of limited value.

I ROBERTS


This book is introduced as being “suitable for cytogenetic technologists and clinicians alike”, and at first glance, appears to provide a comprehensive overview of all aspects of clinical cytogenetics. However, on closer examination, the book is a rather curious mixture of information. The introductory chapters are perhaps the most confusing. The overview of the biochemistry of genetics is brief, to the point that of, to mention, knowledge of the processes of replication, transcription, and translation to understand the chapter, thereby rendering it largely surplus to requirements. The chapter on chromosome nomenclature and truncation of the Paris ISCN and because the authors are only too happy to refer the reader to suitable manuals for laboratory methodology, it would seem appropriate to do so for this topic also. There is a general lack of cohesion about the book, almost as though none of the authors had any knowledge of the contents of the other chapters. That said, several of the chapters on clinical cytogenetics provided very useful summaries, and several included comprehensive tables of data pooled from various sources to give an easily understandable reference for aetiology of several classes of chromosome disorder. The chapter on cancer genetics, although somewhat thoughtless in its presentation of tumour specific breakpoints, fails to expand on the specific biochemical and genetic results of the rearrangements specified. I felt that this was particularly remiss in the present climate of molecular genetic discovery, because only a few well selected and well described examples would be necessary to whet the reader’s appetite for further discovery. The reader should also be aware that the book suffers from shoddy proofreading. Diagrams are
Indeed, this CD ROM contains a large immunohistochemical, or ultrastructural picture database of the main lesions in the field of oral macroscopical and histopathological lesions. The images of interest are very easy to find using a list or keyword driven search. The quality of the photographs is variable, most of them are sharp, but others are not always focused or are very dark. The data sheet contains all relevant information about the picture but this information is often scanty. However, additional information about different lesions is supplied by separate text slides.

There are three fields containing a selection, image, and database window. It is a nuisance that the database window stays on the screen when another program (such as Word or PowerPoint) is used. The program is easy to use and it is very easy to copy the pictures to PowerPoint slides for use in presentations. In addition, they can be copied to a photo editor (such as Photoshop) so that the pictures can be edited.

In conclusion, this CD ROM contains a wealth of photographic material, which can be used for diagnostic or educational purposes. The layout, however, could be improved.

Calendar of events

Full details of events to be included should be sent to Maggie Butler, Technical Editor JCP, The Cedars, 36 Queen Street, Castle Hedingham, Essex CO9 3HA, UK; email: maggiebutler@pilotree.prestel.co.uk

BSCC Northern Spring Tutorial: Gynaecological Cytology
8 March 2001, Manchester, UK
Further details: BSCC Office, PO Box 352, Uxbridge UB10 9TX, UK. (Tel +44 01895 274 020; fax +44 01895 274 080; email lesley.couch@psilink.co.uk)

Urological Surgical Pathology for the Practising Pathologist
24–26 March 2001, Sanibel Harbour Resort and Spa, Fort Myers, Florida, USA
Further details: Department of Continuing Education, Harvard Medical School, 25 Shattuck Street, Boston, MA 02115, USA. (Tel +1 617 432 1525; fax +1 617 432 1562; email hms-cme@hms.harvard.edu)

Haematology Morphology
26–27 March 2001, St Mary's Hospital, London, UK
Further details: The Academic Secretary, Department of Haematology, St Mary's Hospital Campus of ICSM, Norfolk Place, London W2 1PG, UK. (Fax +44 020 7262 5418)

Histopathology of the Bone Marrow
28 March 2001, St Mary's Hospital, London, UK
Further details: The Academic Secretary, Department of Haematology, St Mary's Hospital Campus of ICSM, Norfolk Place, London W2 1PG, UK. (Fax +44 020 7262 5418)

CD-ROM review


In the UK between January 1989 and December 1999 there were 164 279 reports to the UKfeudalised Diagnostic Surveillance Centre of cases of gastrointestinal caused by rotaviruses—an average of 14 934 each year. Rotaviruses were discovered in animals in the early 1960s and in humans in the early 1970s. For several years, electron microscopy was the only widely available method used for diagnosing infection. Since the early 1980s, molecular, serological, and cell culture methods have come into use and fruitful research on these important pathogens has resulted. This excellent new book provides detailed protocols for these methods.

The central chapters begin with an up to date review of the relevant field, all of which are clearly written, informative, and excellently referenced. The editors have provided a short, but informative, introductory chapter aptly titled "Basic facts". In a chapter contributed by BV Venkataram Prasad and Mary Estes, on electron cryomicroscopy and computer image processing techniques, the structure-function studies of rotavirus particles are beautifully illustrated with computer generated three dimensional reconstructions of rotavirus particles. A chapter by Mary Ramsay and David Brown describes the epidemiology of rotavirus infections and con-