Leading article

Retroperitoneal sarcoma

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Soft tissue sarcoma accounts for less than 1 per cent of all malignant tumours and 10–15 per cent are located in the retroperitoneum. In the UK there are probably fewer than 250 new diagnoses of retroperitoneal sarcoma (RPS) each year. Most available data come from retrospective series and tertiary referral units but, despite this degree of pre-selection, there is broad agreement about clinical presentation, prognostic factors and survival[1–5]. Gastrointestinal stromal tumours are not classified as RPS, and are not discussed here.

Patients presenting with RPS are usually in their mid-fifties and the condition is equally common in men and women. The usual symptoms are abdominal swelling and/or discomfort, and about 80 per cent of patients have a palpable mass. Although the gastrointestinal and urinary tracts are often displaced, they are rarely invaded, and so gastrointestinal and urinary symptoms are unusual.

Sarcomas in the retroperitoneum differ from sarcomas of the extremities in several important ways. RPS carries a much worse prognosis (5-year survival rate approximately 30 *versus* 65 per cent). This is because they are generally bigger, not amenable to conventional radical radiotherapy[6,7], and arise at anatomically complex and surgically inaccessible sites. Even after complete macroscopic excision, local recurrence affects 60–70 per cent of patients and is usually the cause of death. Local recurrence in patients with extremity sarcomas is much less common (15 per cent) and can be controlled, by amputation if necessary; metastatic spread to the lung is the usual cause of death[7]. In the retroperitoneum, two histological subtypes predominate: liposarcoma (60 per cent) and leiomyosarcoma (20 per cent). In the extremities the histological findings are much more diverse. Leiomyosarcomas in the retroperitoneum are usually of intermediate or high grade, and carry a dismal prognosis.

The staging investigation of choice is contrast-enhanced computed tomography (CT) of the thorax, abdomen and pelvis. The diagnosis is usually either apparent or can be suspected. The size, location, relationship to adjacent organs, presence or absence of transperitoneal spread or liver metastases (uncommon) can be determined. Preoperative biopsy is not routinely necessary unless there is doubt about the diagnosis[7]. Liposarcomas demonstrate a characteristic appearance with a predominantly fatty component. Uncommonly, a RPS may be deemed irresectable on the basis of CT findings, typically when there is gross involvement of the inferior vena cava, aorta, superior mesenteric vessels or liver, in which case a biopsy is mandatory to confirm the diagnosis. Because RPS accounts for only one-third of retroperitoneal tumours, other diagnoses must be considered, although most renal, adrenal and pancreatic tumours will have been identified before referral. Intra-abdominal non-Hodgkin's lymphoma is not uncommon and may present as a midline mass, which can displace or encase the aorta, cava or iliac vessels. Metastatic germ cell tumours can pose a dilemma[7] and should be suspected in younger male patients with midline lesions; the diagnosis can be proven by testicular ultrasonography and measurement of tumour markers. Patients with large benign tumours, especially of neurogenic or ectopic adrenal origin (functioning or non-functioning), are sometimes referred on suspicion of the lesion being a RPS. Diagnosis may require biopsy or a period of observation to confirm the benign nature of the tumour. Magnetic resonance imaging may be required under some circumstances.

The prognostic factors that are known to govern survival in RPS are resectability (meaning complete macroscopic excision) and tumour grade[1–5]. Operative risk relating to co-morbidities must be considered. Primary resectability is not dependent on tumour size, histological subtype or grade, and may be influenced by surgical experience. Complete excision offers the only chance of cure, but achieving negative histological margins at all points on the circumference of a RPS is extremely difficult. Recurrence is, ultimately, incurable, unless complete excision of the recurrence can be achieved. Palliative surgery (leaving some irresectable disease) for recurrent liposarcoma of low or intermediate grade can be rewarding in terms of symptom control and longevity. When complete surgical excision is possible, the time to first recurrence and the rate of progress of recurrence are determined by the grade of the tumour.

Liposarcomas[4,5] can grow to an enormous size without being recognized. They usually arise in the

paravertebral area, particularly in the perirenal fat. Rotation and displacement of kidney, colon and other organs are classical radiological features. The radiological appearance of the tumour itself varies according to grade. Low-grade lesions are entirely or predominantly fatty. Higher-grade lesions show increased density and contrast enhancement on CT. Often a variety of grades can be identified within the primary tumour volume. To achieve a complete excision, multiple organ resection may be necessary (usually kidney and colon), but this does not influence the disease-specific survival rate. Recurrent tumours are frequently associated with de-differentiation to a higher grade. Long-term survivors invariably have low-grade tumours that can be excised completely, and the sarcoma-specific 5-year survival rate for such patients is about 60 per cent.

Postoperative conventionally fractionated radiotherapy administered to an equivalent total dose of 60–66 Gy is usually given for extremity sarcomas at high risk of recurrence. Unfortunately, in the retroperitoneum the total dose of radiotherapy is limited by the tolerance of surrounding organs, especially the kidney, bowel and spinal cord; to avoid complications, it is rarely used. Doses of radiotherapy to the retroperitoneum that are realistic are unlikely to be sufficient to eradicate subclinical residual disease. Attempts have been made to compensate for these difficulties by irradiating only the sites at greatest risk[8] and by using expanders to displace vulnerable organs from the field[9]. In the future, newer techniques, such as intraoperative radiotherapy[10], intensity-modulated radiotherapy[7] and protons, might enhance delivery to dose levels proven to be effective in extremity sarcomas. Chemotherapy offers little palliative benefit at this site for well differentiated or de-differentiated liposarcoma, although retroperitoneal leiomyosarcoma may be chemosensitive.

At present, there is no evidence that regular imaging to detect recurrence is of any benefit after complete excision of a RPS. Because recurrent RPS is essentially incurable, palliative surgery should be advised only when a recurrent tumour is symptomatic or if it is thought that further delay will compromise the chance of useful surgical palliation. Each successive operation is more difficult and dangerous than the last, and the number of palliative procedures should be reduced to a minimum. At the Royal Marsden Hospital, current practice is to assess the patient at intervals of 6 months with chest radiography, using CT only when a recurrence is palpable or the patient is newly symptomatic.

One of the important surgical lessons of the last decade has been an understanding of the relationship between the number of patients treated by a surgical service and the outcome following complex operations. Outcome is generally improved when the service manages a large number of similar problems. For this reason, the treatment of RPS should be limited to a few experienced multidisciplinary units; this will also reflect favourably on training and research.

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