III. Local Recurrences and Disseminated Disease

Histological Characteristics of Local Recurrences in Soft Tissue Sarcomas

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Although this is disputed, it seems logical to assume that local recurrence of an adult soft tissue sarcoma, following primary treatment, is likely to be associated with an impaired clinical outcome and poorer survival. If recurrence correlates with an increased risk of metastasis, it is pertinent to wonder whether this reflects any biological change in the nature of the tumour or whether local recurrence represents simply a second opportunity for the same tumour to disseminate: the latter seems more plausible in most cases. In specialist centres, nowadays local recurrence is usually related to surgically difficult sites (e.g., retroperitoneum or head/neck) or to attempted limb salvage in anatomically complex circumstances. In other hospitals, sadly, recurrence is still most often the consequence of inadequate or inexperienced primary surgical management.

How do the histological appearances of local recurrence relate to the primary neoplasm? In most cases it has to be said that there is usually little or no change in morphology. The simple explanation for this is that, quite naturally, local recurrence is most common in high-grade sarcomas, especially the group of pleomorphic sarcomas in adults, and in these tumours the opportunity for histological “progression” is therefore limited. Conversely, if low-grade lesions, for example well-differentiated liposarcoma, recur, they often retain their bland morphology and non-aggressive growth pattern initially, but they have the capacity to change to a higher-grade lesion at a later stage (see below). The various types of histological change which may be seen in a local recurrences are described under separate headings below.

Gradual Progression in Grade

Some tumours tend to be progressively higher grade in recurrences, by moving along a gradual and continuous scale of diminishing differentiation. In other words, they tend to become progressively more cellular, more
pleomorphic, more mitotically active and more necrotic, but these changes are not abrupt. These changes are represented in a spectrum of histological appearances, along which it becomes increasingly difficult to recognise the initial, usually lower-grade, morphology. Tumours which may be characterised by this type of progression are myxofibrosarcoma (myxoid “MFH”), leiomyosarcoma and malignant peripheral nerve sheath tumour (malignant schwannoma). Myxoid liposarcoma also belongs in this category, but tends to become gradually more round-celled in type rather than pleomorphic. This gradual progression in grade usually correlates with a diminished prognosis and may lead to a dramatically increased risk of metastasis (e.g. following transition from pure myxoid liposarcoma to round cell liposarcoma).

**Abrupt Change to Higher-Grade Morphology**

This phenomenon is known as dedifferentiation and is generally defined as being when a low-grade, well-differentiated sarcoma shows abrupt transition, either in the primary tumour or a local recurrence, to a high-grade (usually anaplastic or MFH-like) morphology. In soft tissue lesions this phenomenon is much the most common in liposarcomas, but may also occur in leiomyosarcoma and has been very rarely described in dermatofibrosarcoma, rhabdomyosarcoma and chondrosarcoma. This type of change is also well documented in chondrosarcoma and giant cell tumour of bone and in chordoma. The most frequent clinical implication of this change is the acquisition of metastatic potential in a formerly indolent lesion. In the context of adult sarcomas, this underlies the crucial importance of primary wide excision in well-differentiated liposarcomas which, of themselves, have no capability to metastasise. It is commonly assumed that the appearance of dedifferentiated tumour correlates automatically with high-grade, very aggressive behaviour, but in fact the change in behaviour is often not so dramatic, perhaps because these tumours retain some molecular or genetic characteristics of the initially low-grade progenitor lesion. Therefore metastasis may be delayed.

**Acquisition of Differentiation**

Strange as it may seem, some locally recurrent sarcomas show a greater degree of differentiation than their primary counterparts. This is, however, uncommon and tends to occur only in certain specific circumstances. Firstly, some dedifferentiated tumours (as described above) may revert to their well-differentiated form: this seems to occur in about 10% of dedifferentiated liposarcomas, but not in other sarcomas. In these cases, eventual return to the dedifferentiated, more aggressive form is to be expected. Secondly,