Tissue Diagnosis for Musculoskeletal Tumours

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Musculoskeletal tumour is much less common compared to tumours of epithelial origin. Most of these tumours are benign, with only about 1% malignant in nature. A general orthopaedic surgeon may only come across a malignant primary bone or soft tissue tumour a few times in his entire medical career. The current recommendation is for these conditions to be investigated and treated in centres with musculoskeletal oncology service [1].

Careful clinical evaluation with appropriate plain radiography can provide adequate information for definitive diagnosis and treatment for most cases, especially the benign tumours. For some other cases, further investigations will be necessary. Magnetic resonance imaging (MRI) can provide excellent details on anatomical location of a tumour and delineate vital structures that may have been distorted by the lesion [2]. For primary malignant tumours, computerized tomography scanning is still the gold standard for evaluation of pulmonary metastasis, and bone scan can allow early detection of distant metastasis to other bones. Whole body MRI has recently been recommended for tumour staging but the potential benefit for musculoskeletal tumour is not that convincing [3]. PET may be very helpful for follow up detection of tumour recurrence but its role in diagnosis and staging of musculoskeletal tumours is still being evaluated [4].

Tissue biopsy remains the most important investigation to confirm the diagnosis of a lesion especially when malignancy is suspected. A poorly performed or inappropriately placed biopsy may compromise the subsequent management of a patient. Mankin *et al* [1] has shown that patients investigated outside centres with oncology serviced have higher complication rates related to investigation and treatment of the condition. Potentially salvageable limb may have to undergo amputation as a result of wrongly placed biopsy. Percutaneous needle biopsy was once considered inappropriate for investigating malignant tumours because of potential complications including tumour cell spread by haematoma [5]. With better understanding of tumour pathology and improvement in surgical techniques, needle biopsy has gradually gain popularity over open method of tissue biopsy. Although the specificity and sensitivity of needle biopsy is less than incisional or excisional biopsy [6], it has become the preferred method because of safety and simplicity. The study on incidence of malignant infiltration of osteosarcoma biopsy tract by Roa *et al* demonstrated that risk of local tumour infiltration is higher in open biopsy wounds compared to that if needle biopsy. CT guided needle biopsy has been recommended to improve the accuracy of diagnosis and it can be performed as outpatient basis [7]. Ultrasonoraphy can also help the clinician to avoid areas of necrosis for soft tissue tumours and bone tumours with significant soft tissue extension [8]. The rate can be improved by performing frozen section of the needle biopsy sample and the surgeon may proceed directly to open biopsy if there is any uncertainty [9]. Subsequent needle biopsy or open biopsy can be performed with no major draw back in the definitive treatment or outcome. Cost consideration and limitation of resources are the main reasons for many institutions not adopting these additional measures.

Surgery is still the main mode of treatment for both benign and malignant musculoskeletal tumours. Over the last few decades, chemotherapy has contributed tremendously towards improving the cure rate of bone tumours especially for osteosarcoma [10]. Surgery is still the best way to obtain local control of the tumours. We have come a long way from the period where the whole tissue compartment has to be removed [11]. The technique of wide excision beyond the reactive pseudo-capsule of the tumour instead of radical excision allows many limbs to be salvage with a comparable rate of long term survival [12]. Local recurrence at the biopsy wound has been reported [13]. The study by Rao et al provides us direct evidence of tumour seedling, even after completion of neo-adjuvant chemotherapy. The article also describes several factors that are associated with higher risks of biopsy tract infiltration. This information will help surgeons to plan their surgical margins for effective local tumour control.

Recent researches in genetics for musculoskeletal tumours have generated many interesting findings. Chromosomal and genetic abnormalities have been associated with specific tumours and may dictate its behaviour. Development in this field may eventually lead to gene therapy for the treatment and even prevention of major medical diseases [14]. We are hoping to see more studies and publications in this field, and believed that this is the key to the next major advancement in the treatment of musculoskeletal tumours.

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