Department Of Orthopaedics & Traumatology
Queen Mary Hospital
University Of Hong Kong Medical Centre
Newsletter
A New Millennium
Vol. 2, Issue 1, March 2000

## Editorial Board



**C/o Department of Orthopaedics & Traumatology**
5/F Professorial Block, Queen Mary Hospital,
Pokfulam, Hong Kong.
Tel : (852) 2855 4654
Fax : (852) 2817 4392
Email : ortho1@hkucc.hku.hk

## Professor J.C.Y. Leong

I think you will agree with me that the Editorial Board has done an excellent job in the first year of its work. Three issues have been published, and feedback from readers have been positive and encouraging.

The main catch words for the moment are "The New Millennium" and "New Directions". Our Department's development has always been evolutionary rather than revolutionary. I believe that continuous improvements on several fronts have taken place in the last 20 years. Nevertheless, a new millennium triggers incentive to forge ahead. For the last 8 to 10 years, our Department has put a lot of resources and effort into basic research, which we believe is most important for the advancement of our specialty. There have been significant tangible results in the field of biomechanics, especially of the spine and the upper limb. But perhaps the most exciting and important areas of basic research in the next decade or so, may be in the areas of *biomaterials, tissue engineering, molecular biology research in musculoskeletal tissues, genetics and functional genomics.* Our Department has already made some headway towards these areas of research, and will augment our effort in the new millennium.

For *biomaterials research*, collaboration has already been started with the Shanghai Biomaterial Research & Test Centre, of the Shanghai Second Medical University and the Research Institute of Polymeric Materials, Tianjin University. For *molecular biology and genetic research*, very fruitful collaboration is underway with the Department of Biochemistry and the Institute of Molecular Biology of our University, and the Department of Orthopaedic Surgery of Manchester University, United Kingdom. Much can be and needs to be done in these areas of research. That should excite any healthcare scientist or professional who is interested in the musculoskeletal system.

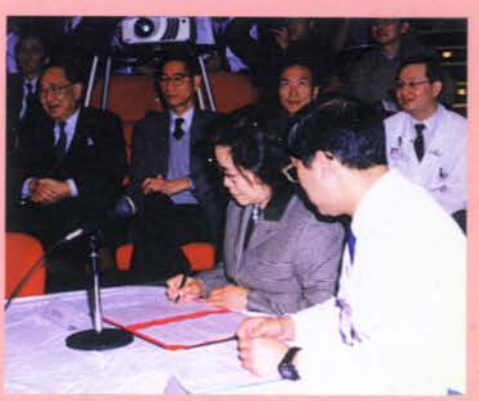
## News in Flash

Professor SP Chow has been appointed as Pro Vice-Chancellor of the University starting on 1st January 2000. He shall be in charge of Human Resources and special projects such as Traditional Chinese Medicine. He still maintains about 50% of his activities with the Department of Orthopaedic Surgery.

Congratulations to Drs WB Wong, KH Ng, Boris Fung and Daniel Yip who successfully passed the Exit Examination of the Hong Kong College of Orthopaedic Surgeons. They are now officially orthopaedic specialists.

Telecommunication conference has the benefit of providing a medium for interactive academic discussion despite great distances between centres. An inaugural teleconference between the Department of Orthopaedic Surgery of the University of Hong Kong and the Peking Union Medical College was held on 22nd January 2000 at the Duchess of Kent Children's Hospital. Professor Grace Tang, Dean of Faculty of Medicine, was invited to sign the Memorandum of Collaboration of the newly established Joint Centre for Spinal Surgery at the Peking Union Medical College.

**A Combined Advanced Orthopaedic Spinal Workshop and Department Research Day** will be held on 7th and 8th July 2000 by the Department. The Workshop will focus on the popular trends, current controversies and new technologies of spinal surgery. The workshop will feature a wide variety of learning strategies including didactic lectures, live surgery, hands-on practice with cadaver and saw bone models, operative demonstration and much more. Details of the Workshop will be finalized soon.



Professor Grace Tang, Dean of Faculty of Medicine, signing the Memorandum.

# Tumours of the Extremities

Dr James KF Kong, Medical Officer
Dr Jimmy Wong, Senior Medical Officer
Dr P Chien, Consultant
Department of Orthopaedics & Traumatology, Queen Mary Hospital

Lumps around the extremities are common. It is true to say that most of the lumps around the extremity are benign, e.g. ganglion. Malignant tumours, of either soft tissue or bone origin, are rare in the extremities. But it is important to be aware of the possibility of malignancy when a lump of the extremity is encountered in a clinical practice. The diagnostic strategies and management of the soft tissue and bony tumours will be discussed.

## CLINICAL EVALUATION

While it is often easy to recognize the common ganglion with its common location around the wrist and its characteristic clinical sign of trans-illumination or a haemangioma with its obvious features (Fig 1), it is sometimes not so easy to differentiate a malignant mass from a benign lesion when it is a solid mass. Therefore it is important to have high a index of suspicion. In general, one should consider any mass below the deep fascia as potentially malignant, particularly if the mass is firm and immobile. Tumour-registry studies in Scandinavia have shown the masses in the extremity that are deep and larger than 5 cm in diameter have a much higher probability of being malignant lesions (Fig 2). A solid mass in the upper extremity in particular should raise a high index of suspicion.

Fig 1. Clinical diagnosis of this pigmented vascular lesion as haemangioma is not difficult.

Fig 2. This intra-operative picture showed a large solid firm right arm mass well over 10 cm, which should be considered as malignant until proved otherwise.

Tumours can be classified into benign or malignant; and if they are malignant, primary or secondary. Sometimes inflammatory or infective lesions can mimic malignant lesions. So it is important to include them as the differential diagnoses.

Patients are usually seen with either a painless or painful mass. An in-depth history with particular emphasis on the following questions should be recorded:

1. How long has the mass been present and is it enlarging?
   In general, a rapid growing mass suggests a malignant tumour. In adults with benign lipomas, there is usually a long history of slow enlargement.
2. Is the mass causing pain?
   Malignant lesions may produce dull-aching, constant and nocturnal pain. Nocturnal pain is an important feature, which suggests either an aggressive or inflammatory lesion.
3. Is there history of trauma?
   Heterotopic ossification may follow after trauma. In addition, foreign bodies may result in soft tissue infection.
4. Is there history of cancer?
   Carcinoma of lung, pancreas and breast as well as lymphoma commonly metastasizes to skin and subcutaneous tissue.
5. Are there any systemic signs and symptoms?

The physical examination should include the region of interest, the regional and major lymph nodes and the abdomen.

## MANAGEMENT

Prior to treatment, the following information needs to be obtained: (1) pathological diagnosis (2) local extent of tumour (3) extent of distant spread of tumour if malignant. These principles apply equally well in both soft tissue and bone tumours. The first is obtained by biopsy and the latter two by clinical staging. It has to be emphasized that in suspected sarcoma, biopsy is performed only after staging is completed, and it should only be done by the surgeon who will perform the definitive surgery.

### Local Extent of Tumour

Plain radiographs are made in two planes. These are carefully studied with special attention to (1) the anatomical site of the lesion (2) zone of transition between the lesion and the host bone (3) any mineralization within the soft tissue lesion and changes in underlying bone (Fig 3).

Fig 3. Radiograph showing periosteal reaction and permeative pattern of the bone erosion in the proximal humerus with Ewing's sarcoma.

The anatomical site is crucial to the diagnosis of bone tumours. Some tumours have a predilection for the axial skeleton whereas others occur mainly in the long bones. The zone of transition is also important. If the zone of transition is wide or poorly demarcated, without clear boundaries, or if it has a permeative appearance, then it is likely to be aggressive. Benign soft tissue lesions that may contain mineralization include heterotopic ossification, lipomas, chondromas and haemangiomas. Synovial sarcoma, liposarcoma and soft-tissue osteosarcoma are the principal malignant lesions that may have extensive mineralization.

Magnetic resonance imaging has replaced most of the imaging modalities such as ultrasound and computed tomography. MRI demonstrates the extraosseous and intraosseous extent of a bone tumour and involvement of a joint. It also detects skip metastases, which are neoplastic foci that are located at distance from the primary tumour. Malignant tumours, in contrast to benign tumours, are likely to appear as heterogeneous masses on both pulse sequences and often oedema is seen to surround the mass on T2-weighted images (Fig 4 and 5).

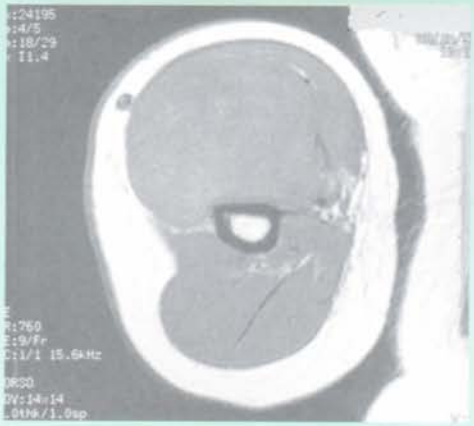


Fig 4. MRI scan of the arm mass shown in Fig 2. T1 signal showed a swelling within the flexor compartment of the arm.

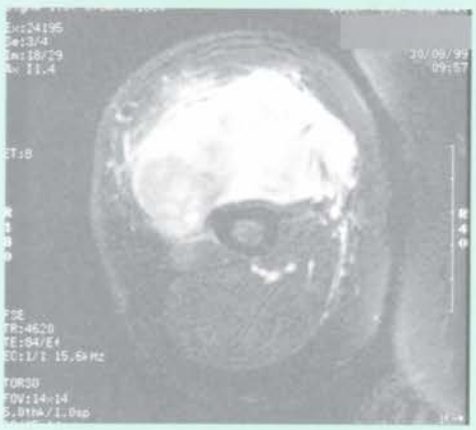


Fig 5. Heterogenous T2 signal was very suggestive of a malignancy which was later proved histologically as malignant fibrous histiocytoma.

## Distant Extent of Tumour

Since the lung is the most common site of metastatic disease in these patients, computed tomography of the lung is an essential part of staging for a patient with suspected malignant soft tissue tumour.

Scintigraphy is a sensitive but non-specific tool for the assessment of bone tumours. It is used to detect polyostotic bone disease or bone metastases. Nevertheless, it cannot distinguish benign from malignant lesions and it cannot accurately determine the extent of a tumor.

## Biopsy

Biopsy and pathological evaluation of a tumour are the last events in the evaluation and staging process. Needless to say, *it should be performed by the surgeon who will do the definitive surgery.* It may be a closed procedure performed with needles or trephines or an open procedure involving incision or excision of the tumour mass. There are certain general principles when performing a biopsy and the aims are (1) the incision is longitudinal so that track can be excised en bloc with the tumor, (2) no additional compartments or neurovascular structures are contaminated (3) the specimen is taken from a soft-tissue mass to lessen the risk of pathological fracture (4) frozen section may be taken intraoperatively to confirm the diagnosis and to ensure adequate specimen has been taken.

## Staging System for Bone and Soft-tissue Sarcoma

The staging system described by Enneking et al is considered an operative staging system. The stages in this system are based on three factors: histopathological grade (G), site (T) and the presence or absence for metastasis (M). The anatomical site (T) may be either intracompartmental (A) or extracompartmental (B). At present, this information is obtained preoperatively by imaging and further confirmed by operative findings.

## Treatment

A therapeutic strategy that includes operative treatment, chemotherapy and irradiation can be devised once the diagnosis, the local extent and the distant extent of the tumour are known. The type of resection can be defined as intralesional (curettage), wide (normal tissue outside the pseudocapsule) or radical (the entire compartment). From an oncological point of view, whether the margin is achieved by a local procedure or by amputation is irrelevant. With the advent of chemotherapy, radiotherapy and brachytherapy (Fig 6), limb salvage with resection of tumour and reconstruction is often possible. Different techniques of reconstruction are evolved (autograft, allograft, osteochondral graft, osteoarticular graft and allograft-prosthesis composite) in order to preserve the limb (Fig 7 and 8).

Fig 6. Patient with brachytherapy tubes in the thigh.

Fig 7. Reconstruction using massive allograft is one of the methods in limb salvage tumour surgery.

Fig 8. Radiograph showing allograft replacement of the proximal humerus fixed with double plates after excision of a Ewing Sarcoma.

Lastly but not all, it is empirical for a medical practitioner to refer these patients to specialists upon any clinical suspicion of malignant musculoskeletal tumours.

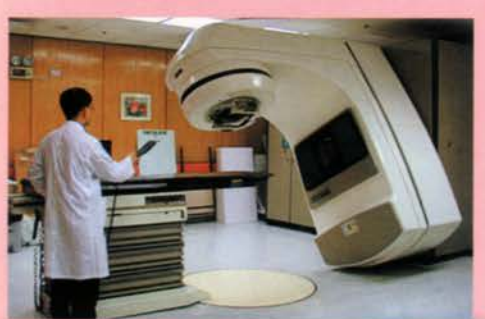
**Answers to Radiographic Quiz**

AP view of the right femur shows ill-defined lytic lesions at the medial distal metaphysis of the right femur. There are associated overlying cortical erosion and periosteal reaction. The zone of transition of the involved area is wide. No associated soft tissue mass is apparent. Sclerotic lesions are present more distally in the medial distal femoral metaphysis. Features are those of an aggressive lesion, such as malignant neoplasm or osteomyelitis. In the absence of systemic symptoms, malignant neoplasm is the most likely diagnosis. In a patient of this age, osteosarcoma must be the considered first. The lesion was subsequently confirmed histologically to be osteosarcoma (chondroblastic type).

# The role of a clinical oncologist in the management of soft tissue and bone sarcoma

Dr Ray TT Chan
Medical Officer & Honorary Clinical Assistant Professor
Department of Clinical Oncology
Faculty of Medicine
University of Hong Kong

The Department of Clinical Oncology is a comprehensive cancer centre formed by an amalgamation between the Hospital Authority Clinical Oncology Services at the Queen Mary Hospital and the Department of Radiation Oncology of the University of Hong Kong.



Linear accelerator

Computer planning in radiotherapy

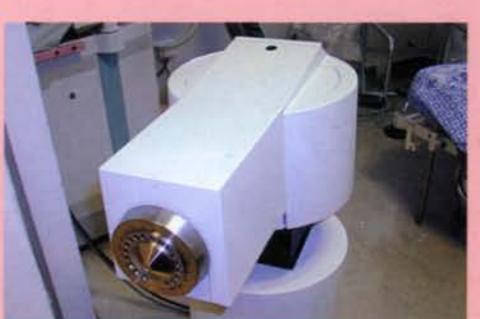
We work in close collaboration with other oncologic experts and in the field of orthopaedics, we offer a comprehensive range of treatment options for patients with osteosarcoma and soft tissue sarcoma highlighting the importance of multidisciplinary management especially in the role of limb-salvage treatment.

In the area of bone sarcoma, we offer standard chemotherapy (neo-adjuvant and adjuvant) utilising a 40-week program of high dose methotrexate alternating with a combination of adriamycin and cis-platinum. In appropriately selected patients, the chance of limb-salvage surgery is much enhanced with such a practice. Together with the expertise of our orthopaedics colleagues and the backup of a bone bank, our own results of limb-preservation surgery is comparable to international standard.

As for patients with advanced osteosarcoma, palliative chemotherapy and radiotherapy may be effective in alleviating symptoms and hence may improve quality-of-life which is an important emphasis of our daily practice here at Queen Mary Hospital. To that end, we have established an in-house Palliative Care Consultative Services which entail a dedicated clinical oncologist with specialist palliative care training and a highly trained team consisted of nurse-specialists, clinical psychologist, physiotherapist, occupational therapist and pharmacist. We offer both inpatient as well as outpatient consultations and to reduce our patients' burden, a domicilliary care team is also being sent on patient home-visit weekly.

The multidisciplinary nature of our modern day oncologic services is also exemplified in the management of patients with soft tissue sarcoma. Radiotherapy is tailored individually according to pertinent clinical variables. A combination of post-operative external beam radiotherapy and brachytherapy (or, in selected patients, one or the other modality alone) will improve the rate of local control as well as that of limb preservation and last but not least, the cosmetic and functional outcome of such patients. Our practice of chemotherapy in soft tissue sarcoma also reflects our dogma of evidence-based practice. We do not advocate routine adjuvant chemotherapy as the expected benefits are small when compared to the side effects and potential long-term morbidities. On the other hand, there is probably a role for palliative chemotherapy and in selected patients, it does provide symptomatic relief and we would clinically select patients accordingly.

In short, the multidisciplinary approach in sarcoma here at the Queen Mary Hospital is reflected by the close collaboration between different medical and paramedical experts. This holistic service, we believe, represents the cornerstone on which future improvement on the outcome for such patients are built.



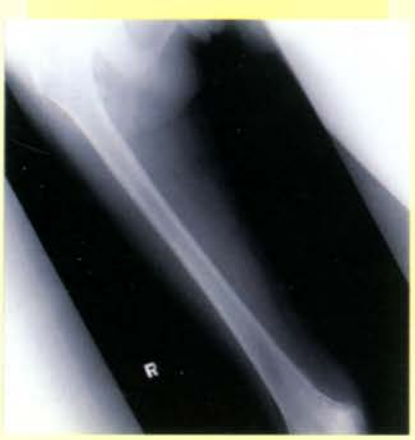
High dose-rate afterloading brachytherapy machine

# Radiographic Quiz

Dr. A. C. W. Chin
Department of Radiology
Queen Mary Hospital

A 14-year-old girl presented with right leg pain for a few weeks. There was no history of trauma. She was otherwise well with good past health and no systemic symptoms.

What are the radiological findings on this AP view of the right femur? What is the diagnosis?




# Donations

The DH Chen Foundation has donated HK$3.5 million to set up a Centre for Paraplegic Walking at the Department of Orthopaedic Surgery, Queen Mary Hospital.

The DePuy International Limited has donated HK$1.5 million to support clinical research related to Knee Replacement Surgery with Dr Peter KY Chiu as Principle Investigator.

The Shun Hing Education and Charity Fund Limited has donated HK$1 million to set up the Dr William MW Mong Development Fund in Orthopaedic Surgery, in recognition of the work and contribution of the Department towards Orthopaedics and Traumatology.

Correspondence: Editorial Board, **News**letter,
Department of Orthopaedics & Traumatology, 5/F Professorial Block, Queen Mary Hospital, Pokfulam, Hong Kong.
Tel: (852) 2855 4654 Fax: (852) 2817 4392 Email: ortho1@hkucc.hku.hk