Recent Advances In Imaging Of Bone Tumours

Essay
Submitted for partial fulfillment of
Master Degree in Orthopedic Surgery

Presented By
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(M.B.B.Ch)

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التقنيات الحديثة في التصوير الإشاعي
لأورام العظام

رسالة

مقدمه من الطبيب/ **مصطفى يسري السيد مصطفى**
بكالوريوس الطب و الجراحة

توطئة للحصول على درجة
الماجستير في جراحة العظام

تحت إشراف

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CONTENTS

Aim of the study

The aim of this study is to review recent advances in imaging of bone tumours and their importance in detection and early dignosis of different types of bone tumours.

Introduction

The development of medical imaging has progressed remarkably over the past fewdecades. Medical imaging such as radiography, computed tomography (CT), magnetic resonance imaging (MRI), positron emission tomography (PET),can be used for detection, localization, visualization, and characterization of tumors.(1)

Imaging is essential for the diagnosis of all tumours that are not accessible to clinical evaluation . Although a precise histological diagnosis must be made before treatment is instigated , a diagnosis of ‘malignancy' is frequently made based on imaging information alone . Bone is one of the sites in which imaging plays a key role in diagnosis.(2)

Accurate staging of patients with malignant disease is a fundamental part of their management and a major challenge for imaging . It is only by appreciating the local regional and systemic extent of the disease process that oncologists are able to make rational decisions regarding the most appropriate treatment strategy.(3)

In the evaluation of primary bone tumours , the roles of radiologists and histopathologists are complementary . The morphological features of primary bone neoplasms are best demonstrated on plain radiographs.(4)

A number of advances have occurred in CT, CT is the mainstay of measuring changes in tumour volume with imaging.(4)

MRI has a number of imaging benefits , including superb soft tissue contrast, multiplanar and 3D image acquisition capability, freedom from bony artefacts, and high signal specificity. Other advantages include the absence of exposure to ionizing radiation (an important factor when imaging children , pregnant women, and the young with curable tumours) and the ability to acquire biological and physiological information. (5)

The purpose of imaging bone metastases is to identify the presence and extent of disease, evaluate complications such as spinal cord compression or fractures, and to monitor therapeutic response. (4)

Technetium (Tc)-99m- labeled diphosphonate scintigraphy is used in the staging of bone tumors to evaluate for the presence of metastases. (6)

FDG PET has been shown to be useful for detection of local recurrence,(7) and metastatic disease in patients who have sarcoma. (8)

Radionuclide bone scans have been a reliable tool for detecting multifocal osseous lesions and remain the mainstay for evaluation of osseous metastases. (9)

The increasing and more widespread use of advanced and improved imaging techniques in the earlier process of oncologic work-up will result in the delineation of smaller lesions . This suggests that primary tumors , metastatic nodes , and distant metastases are diagnosed when they are smaller. This will result in a shift in treatment of cancers to an earlier stage. (10)

الملخص العربى

إن التطور في التصوير الإشاعي شهد تقدما كبيرا في العقود الأخيرة.

و يعتبر التصوير الإشاعي أساسا لتشخيص الأورام التي لا يمكن تشخيصها إكلينيكيا و تعتبر العظام من الأماكن التي يلعب التصوير الإشاعي دورا أساسيا في تشخيص أورامها.

تقسيم أورام العظام الخبيثة يعتبر جزءا أساسيا من العلاج اللازم لها ويمثل ذلك تحديا كبيرا للتصوير الإشاعي لأورام العظام.

التشخيص الأمثل لأورام العظام يعتبر دورا مشتركا بين كلا من التصوير الإشاعي و التحليل الهستوباثولوجي.

من أنواع التصوير الإشاعي لأورام العظام:

- الأشعة العادية.
- الأشعة المقطعية بالكمبيوتر.
- الأشعة بالرنين المغناطيسي.
- الأشعة بالموجات فوق الصوتية.
- المسح الذري للعظام.

إن التقدم و التوسع في تطوير تقنيات التصوير الإشاعي واستخدامها في المراحل المبكرة للأورام يساعد على اكتشاف الأورام الأولية و الثانويات في المراحل المبكرة وهذا يؤدي إلى نقلة كبيرة في علاج الأورام في مراحلها المبكرة.

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