Service Priorities and Programmes

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Submitting author: Dr Sunny Kin Sun TSE
Post title: Associate Consultant, Queen Elizabeth Hospital, KCC

Diagnostic performance of imaging-guided percutaneous core-needle biopsy of musculoskeletal tumours in children in a tertiary orthopaedic oncology centre

KS Tse (1), SS Cheng (1), KC Lai (1), WSW Chan(1), MK Chan (1), CL Chan (2), KL Mak (3), ST Fong (3), YC So (3) KW Tang (1), SCH Chan (1)
(1) Department of Radiology and Imaging, Queen Elizabeth Hospital (2) Department of Pathology, Queen Elizabeth Hospital (3) Department of Orthopaedics and Traumatology, Queen Elizabeth Hospital

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Introduction

Imaging-guided percutaneous core-needle biopsy has been demonstrated to be an effective and less invasive method in tissue sampling and diagnosing musculoskeletal tumours in adult population. It carries the advantages of high safety profile, lower invasiveness, and comparable diagnostic efficacy when compared to open biopsy, the gold standard. Nevertheless, there are no data on its efficacy in local paediatric population.

Objectives

This retrospective study aimed to evaluate the diagnostic yield and accuracy of CT- and US-guided percutaneous core-needle biopsy of musculoskeletal tumours in patients at/below 18 years old, in a local tertiary orthopaedic oncology hospital. The tumour characteristics and technical factors affecting the diagnostic performance, as well as safety profile were also evaluated.

Methodology

All consecutive patients referred to the Department of Radiology and Imaging for CT- and US-guided percutaneous core-needle biopsy of suspected musculoskeletal tumours, performed between January 2008 and December 2013, were recruited. Those patients subsequently diagnosed infection or inflammation, and lost to follow up were excluded. The pathological diagnosis from each core-needle biopsy case was correlated with the final histology obtained from operation or open biopsy; and on the other hand, it was correlated with the diagnosis from clinico-radiological follow up in those patients who did not undergo operation. Diagnostic yield examined the proportion of biopsies producing specific pathological diagnosis. Diagnostic accuracy examined the concordant rate of the biopsy result and final diagnosis. Factors

affecting the yield and accuracy were analyzed by student's t test for numerical variables, and chi-square test for categorical variables.

Result

There were 53 cases of CT- and US-guided percutaneous core-needle biopsy of musculoskeletal lesions within the study period. Total 46 cases were eligible and included. 25 cases were performed under US guidance, and 21 cases under CT guidance. The median age was 14 years old (ranged from 0 to 18 years). The diagnostic yield of US-guided biopsy was 84%, and CT-guided biopsy was 86%. The diagnostic accuracy of US-guided biopsy was 76%, and CT-guided biopsy was 81%. The diagnostic yield and accuracy of malignant tumours were statistically higher than that of benign tumours ($p=0.02$ and $p=0.002$ respectively). There was no association between the imaging modality and diagnostic yield/accuracy. No complication related to the procedure was encountered. To conclude, imaging-guided percutaneous core-needle biopsy of musculoskeletal tumours is an effective and safe examination, and can be regarded as the first-line investigation in tissue sampling in children.