Avoiding diagnostic pitfalls in mimics of neoplasia: the importance of a comprehensive diagnostic approach

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ABSTRACT Any medical diagnosis should take a multimodal approach, especially those involving tumour-like conditions, as entities that mimic neoplasms have overlapping features and may present detrimental outcomes if they are underdiagnosed. These case reports present diagnostic pitfalls resulting from overdependence on a single diagnostic parameter for three musculoskeletal neoplasm mimics: brown tumour (BT) that was mistaken for giant cell tumour (GCT), methicillin-resistant Staphylococcus aureus osteomyelitis mistaken for osteosarcoma and a pseudoaneurysm mistaken for a soft tissue sarcoma. Literature reviews revealed five reports of BT simulating GCT, four reports of osteomyelitis mimicking osteosarcoma and five reports of a pseudoaneurysm imitating a soft tissue sarcoma. Our findings highlight the therapeutic dilemmas that arise with musculoskeletal mimics, as well as the importance of thorough investigation to distinguish mimickers from true neoplasms.

Keywords: diagnosis errors, musculoskeletal, neoplasms, tumour-like conditions

INTRODUCTION

As clinicians’ diagnoses have profound impact on patients’ health, it is in the patients’ best interest that diagnoses are as accurate as possible. In musculoskeletal oncology, it is not uncommon to have similar presentations of different conditions in terms of clinical, radiological and histological findings. This complicates the decision of how to manage the condition since several different diagnoses need to be entertained. For example, in tumour-like conditions, a benign entity can simulate a malignant neoplasm and vice versa. To differentiate one from the other is of paramount importance, as a wrong diagnosis is potentially hazardous to the patient. The key to achieving this is familiarising oneself with such mimics and considering all diagnostic parameters before proceeding to definitive management. Herein, we present multiple instances involving tumour-like conditions where the initial diagnosis was made based solely on one outstanding diagnostic parameter. We discuss the factors contributing to these diagnostic complications with the aim of making clinicians more aware of and sensitive to the possible pitfalls in their diagnoses, thus improving their practices.

CASE REPORTS

Case 1

A 36-year-old woman who was previously healthy presented to her district hospital with a painful lump on the proximal left leg. It was first noticed two years prior to consultation and was associated with generalised myalgia and mechanical low back pain. She had no previous history of trauma, fever, cough or constitutional symptoms. Physical examination revealed a tender, hard mass, 5 cm × 5 cm mass with no overlying skin changes on the anterior aspect of her proximal left leg. The range of motion of her left knee was limited due to pain. Examination of her back elicited tenderness at the L4 and L5 region with no neurologic signs.

Fig. 1 Case 1. Plain radiograph of the left tibia shows a lytic lesion at the epiphysis of the proximal tibia (arrow), with the lesion poorly demonstrated on anteroposterior view.

Anteroposterior and lateral radiographic views of her left tibia and fibula performed at the same hospital showed a well-defined, eccentric, lytic epiphyseal lesion of the left tibia (Fig. 1). Spinal radiographs revealed generalised diffuse osteopenia of thoracolumbar vertebra, with no evidence of fracture. Magnetic resonance (MR) imaging of her left knee showed an enhancing, expansile mass in the anterior metaphysis of her left tibia extending to epiphyses anteriorly, with low signal intensity on T1-weighted and heterogeneous intermediate intensity on T2-weighted images. The clinical impression was that she had a giant cell tumour (GCT) and she was subsequently referred for further management.

At our centre, the patient underwent a core needle biopsy of the left tibia, and the tissue sample was sent for culture and histopathological examination (HPE). Tissue HPE showed a proliferation of spindle stromal cells with nuclei features similar to those of a giant cell and osteoclastic giant cells around blood vessels, suggestive of a giant cell-like lesion. When we correlated the patient’s history of generalised bone pain with the generalised diffuse osteopenia on her radiograph, brown