Acta Orthopaedica et Traumatologica Turcica xxx (2017) 1–4

Contents lists available at ScienceDirect

Acta Orthopaedica et Traumatologica Turcica

journal homepage: https://www.elsevier.com/locate/aott

The giant cell tumour of the proximal phalanx of the thumb treated by a 2-stage operation

Paweł Reichert [a, *], Przemysław Kowalski [b], Jerzy Gosk [a]

[a] Department of Traumatology, Clinic of Traumatology and Hand Surgery, Wroclaw Medical University, Wrocław, Poland
[b] Department of Pathomorphology and Oncological Cytology, Wroclaw Medical University, Wrocław, Poland

ARTICLE INFO

Article history:
Received 9 April 2015
Received in revised form
23 July 2015
Accepted 11 November 2015
Available online xxx

Keywords:
Bone tumours
Giant cell tumour
Thumb

ABSTRACT

We present a 29-year-old woman who was treated for a giant-cell tumour of her thumb. Surgical treatment was performed in two stages. In the first stage, the tumour was removed and the first metacarpal and distal phalanges were fixed by an external fixator. In the second stage of reconstruction of the thumb, a cortico-cancellous bone graft from the iliac crest, an external fixator and double arthrodesis were used. This two-stage procedure provides the possibility for confirming the diagnosis and appropriate treatment choice and minimizes the risk of recurrence.

Introduction

Giant cell tumour (GCT) in bone is usually located in the ends of the long bone, accounting for approximately for 5% of primary bone tumour. Only 2–5% of GCTs are located in the hand.[1–3] In the hand region, GCTs are primarily located in the metacarpal bones; second, they are located in the phalanges and, rarely, they are located within the thumb. As Yanagisawa[3] reported, the location of the hand is associated with a young age that typically ranges from 20 to 30 years. We will present the diagnostic and therapeutic process for GCT of the proximal phalanx of the thumb. The treatment was performed with the following two surgical procedures: surgical resection of the tumour and reconstruction of the thumb with a cortico-cancellous bone graft, external fixator and double arthrodesis.

Patient and methods

A 29-year-old woman presented with swelling at the base of the thumb of dominant left hand. The patient had first observed symptoms 4 weeks before medical examination. The patient reported no prior injuries and no history of disease or other comorbidities. She gave birth to a daughter 4 months prior. She had no pain at rest, only swelling, and no redness. The range of motion at the metacarpophalangeal joint (MP) as well as at the interphalangeal joint (IP) was limited by pain and swelling. There was no disturbance in her sensation or blood supply. Radiologic evaluation showed a large, irregular, expansive lesion in the proximal phalanx of the left thumb (Fig. 1). The tumour was classified as second stage according to the Campanacci Radiological Grading System. MRI scans showed the tumour had a fairly homogeneous, intermediate signal on T1-weighted images. T2-weighted images demonstrated a hyperintense lesion of the entire proximal phalanx of the thumb (Fig. 2). The scintigraphy survey did not show neoplastic changes in other places. It revealed a significant increase in uptake within the affected tissue. Radiography and MRI supported a diagnosis of GCT. Due to the extent of the changes, suspicion of malignancy and risk of metastasis, we not use a fine needle aspiration biopsy; instead, we used as a basic standard in the case of suspected GCT in a typical location around the knee.

The surgery began with placement of the external fixator. The procedure was performed using the dorsal approach. The procedure involved unveiling of the distal part of the first metacarpal bone, proximal phalanx and base of the distal phalanx. The proximal phalanx was changed and expanded along the entire length. The tumour was fully excised. In the cross-section, there was a non-uniform structure with necrosis and dissolution characteristics in the central portion. The articular cartilage, from the distal first metacarpal bone and proximal portion of the distal phalanx, was removed. The procedure revealed normal, intact bone structure.

* Corresponding author.
E-mail address: pawelreichert74@gmail.com (P. Reichert).
Peer review under responsibility of Turkish Association of Orthopaedics and Traumatology.

http://dx.doi.org/10.1016/j.aott.2017.03.015

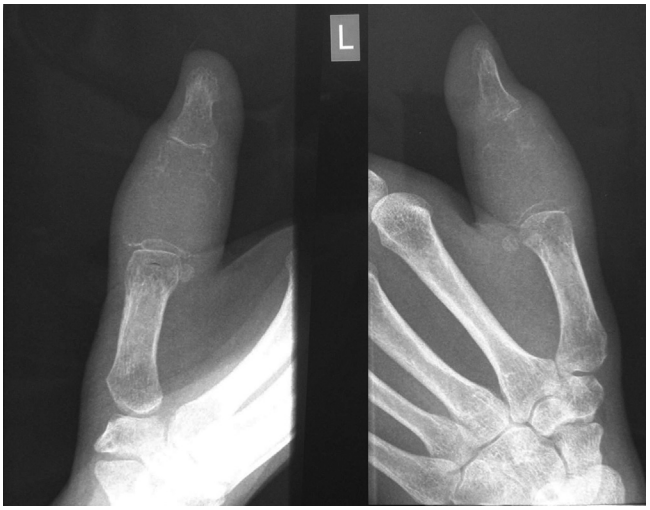

Fig. 1. Preoperative posterior - anterior x-ray both hands demonstrating the expansive lytic lesion of the proximal phalanx of the thumb.

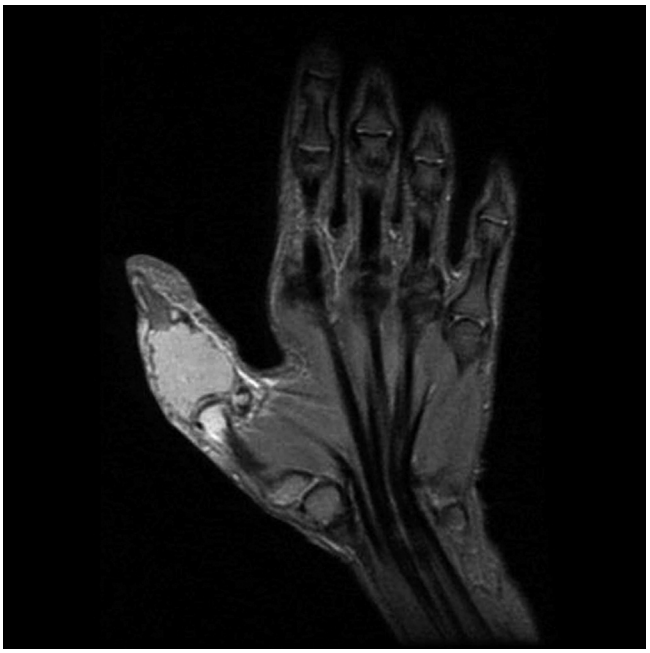

Fig. 2. T2 weighted coronal MRI demonstrating a hyperintense lesion of the whole proximal phalanx of the thumb.

We removed the bone's fragment, and the bone sample from the exposed first metacarpal bone and distal phalanx was sent for histopathological examination (to ascertain that the tumour was radically removed with a safety margin).

The immobilization was performed using an external fixator with two pins in the first metacarpal bone and one pin in the distal phalanx. The histopathological results revealed a GCT (Fig. 3), confirmed radical excision and ruled out the presence of tumour residue. After 2 weeks, the second operation was performed. Old scar tissue was removed, and the bone was decorticated. The external fixator was applied with small distraction; then, between the 1st metacarpal and distal phalanx, the cortico-canceolous bone graft from the iliac crest was inserted. The bone autograft was fixed using two Kirschner's wires (Fig. 4). The thumb was positioned in opposition and double arthrodesis was created. After 4 weeks, bone

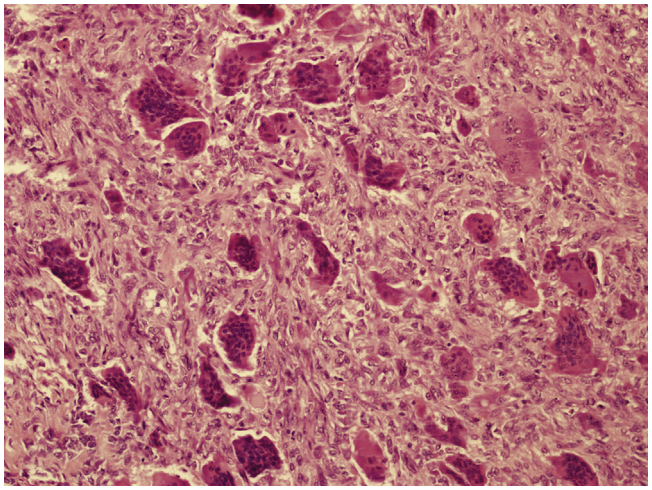

Fig. 3. Histologic appearance of a giant cell tumor (magnification 200, haematoxylin-eozin staining). Histologic specimen of the giant cell lesion.

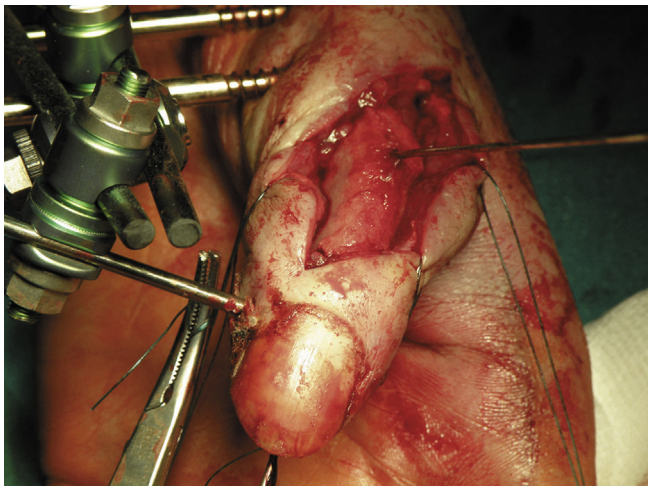

Fig. 4. Intraoperatitely picture, showing stabilization bone graft by K wire.

union was achieved and the external fixation was removed according to the procedure.

Results

At the 24-month follow up examination, the patient had no evidence of giant-cell tumour and had no range of motion in the MP and IP, but she had strong bone union (Fig. 5). The thumb was in opposition, allowing the patient to perform activities of daily living (Fig. 6). The DASH score was 9.5, and the VAS score was 1. There was no tenderness on palpation, and the touch and discriminatory sensations were comparable with the other hand.

Discussion

GCT was originally thought to be a type of osteosarcoma. Some authors have reported that the diagnosis could be made by excluding other possibilities. The radiologic differential diagnosis for such lesion includes aneurysmal bone cysts, benign chondroblastoma, non-osteogenic fibroma, simple bone cyst, and, in some cases, osteosarcoma, brown tumour of hyperparathyroidism, enchondroma, metastatic disease, chondrosarcoma, and giant cell

Please cite this article in press as: Reichert P, et al., The giant cell tumour of the proximal phalanx of the thumb treated by a 2-stage operation, Acta Orthop Traumatol Turc (2017), http://dx.doi.org/10.1016/j.aott.2017.03.015