

Short Report

Proximal femur osteoid osteoma in children: Diagnosis and management: A case series

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Sri Lanka Journal of Child Health, 2022; **51**(3): 444-447

DOI: <http://dx.doi.org/10.4038/sljch.v51i3.10248>

(Keywords: Osteoid osteoma, Proximal femur, Percutaneous CT guided thermos-ablation, Biopsy)

Background

Osteoid osteoma is the commonest benign osteogenic lower limb tumour with 25% involving the proximal femur¹. A radiologist, with improvised skills on musculoskeletal imaging and its sequencing with higher imaging will greatly help in addressing the lesion and its location to narrow down the diagnosis^{1,2}. However, the location of the lesion in proximal femur (intra or extracapsular) and its atypical clinical presentation sometimes surprises with tissue diagnosis warranting a biopsy at pre-procedural level to establish a working diagnosis³⁻⁶. However, management of osteoid osteoma by techniques like computed tomography (CT) guided percutaneous radiofrequency ablation or percutaneous bone drilling have yielded promising results⁷⁻¹⁰.

Method

A prospective case series was conducted at the Sri Ramachandra Institute of Higher Education and Research, Porur, India, from November 2016 to June 2019. All children below 18 years of age with hip pain and x-ray / CT scan suggestive of osteoid osteoma located in proximal femur, planned for percutaneous CT guided radio-frequency ablation, were included. Lesions other than proximal femur sites, different planned intervention and inconclusive diagnosis were excluded.

Visual analog scoring (VAS) for pain before and after the procedure was recorded. Written informed consent was obtained from parents of all children included in the case series.

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(Received on 03 February 2022: Accepted after revision on 18 March 2022)

The authors declare that there are no conflicts of interest

Personal funding was used for the project.

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Results

There were 11 children who fulfilled inclusion criteria during study period. Mean age was 11 years; six (55%) were females and 5 (45%) were males. Left lower limb was affected in 7 (63%) cases and the right in 4 (37%). Location of lesion was lesser trochanter in 5 (45%) cases, neck of femur in 4 (36%) and sub-trochanteric area in 2 (18%). All subjects were planned for percutaneous CT guided thermos-ablation. No biopsy was done prior to procedure. VAS scoring pre-procedure averaged 8; post-procedure average score was less than 1. Better pain relief was observed in older than younger children.

Discussion

In our case series of 11 children, all presented with a varying timeframe of hip pain with medical management for two months or more, with multiple consultations, and with no history of significant trauma to the same site. Diagnosis was established with typical clinical presentation and radiological parameters like x-ray and CT scan for location of the lesion (nidus) with adjunct blood parameters. VAS scoring was recorded for all patients, pre- and post-procedural intervention. Biopsy and bone scans were not done in our study.

All 11 children underwent percutaneous CT-guided thermos-ablation under general anaesthesia in prone or floppy lateral position in the CT scan room; the operating site was marked pre-operatively, and under CT guidance, location of the lesion and its approach over the skin were marked. Through a stab incision of less than 0.5cm, a trephine biopsy needle was passed from the skin advancing to the lesion through the near cortex of bone with gentle manual pressure by turns and after confirmation with CT scan, needle was removed and the thermos-ablation electrode was inserted through the same path of biopsy needle, confirmed with CT imaging for its location at the nidus site, then connected to RF generator, and thermos-ablation was done at 90°C for about 5-6 minutes; electrode was then removed and a small sterile bandage applied at the skin site (Figures 1-5). After extubation, child was shifted to the ward for observation and the next day VAS

scoring was recorded and child was discharged with gradual resumption of activities.

Young age, atypical clinical presentation, and intra-capsular location of lesion, as of differential peri-biological behaviour happening around the intra-capsular region of the femoral neck, lead to pitfalls in diagnosis and warrants a multidisciplinary approach to establish histopathological diagnosis before any interventional procedure. Biopsy remains debatable for osteoid osteoma; medical management warrants observation with non-steroid anti-inflammatory drugs (NSAIDs) and sequelae resolve naturally in due course, whereas surgical management requires histopathological analysis of lesion to support and justify the procedural intervention^{4,7}.



Figure 1: X-ray of pelvis

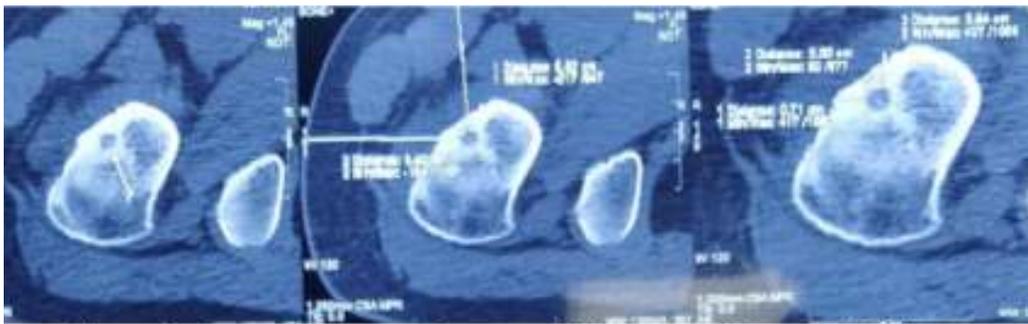


Figure 2: Computed tomography scan of right proximal femur with lesion

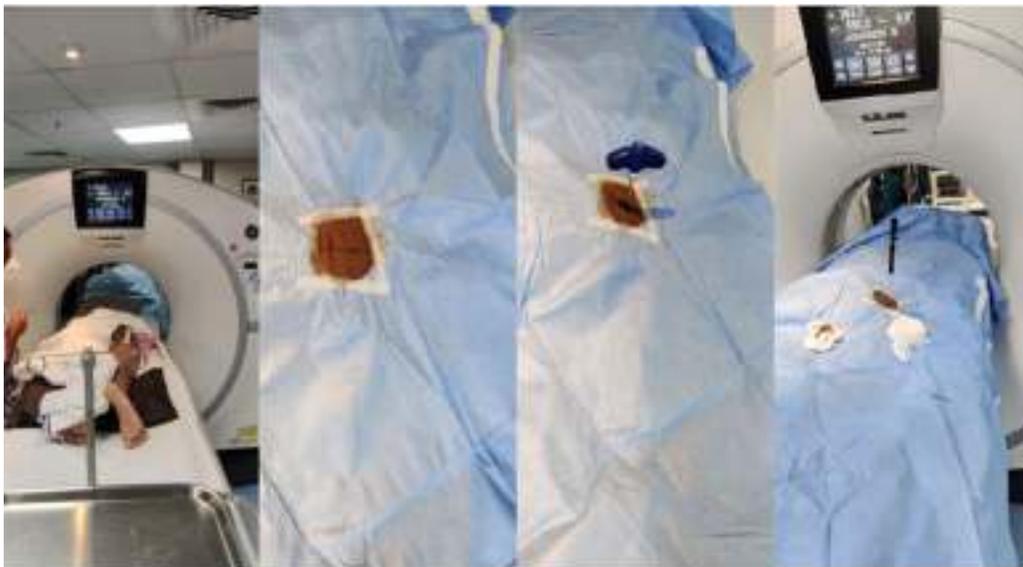


Figure 3: Positioning on computed tomography table with electrode

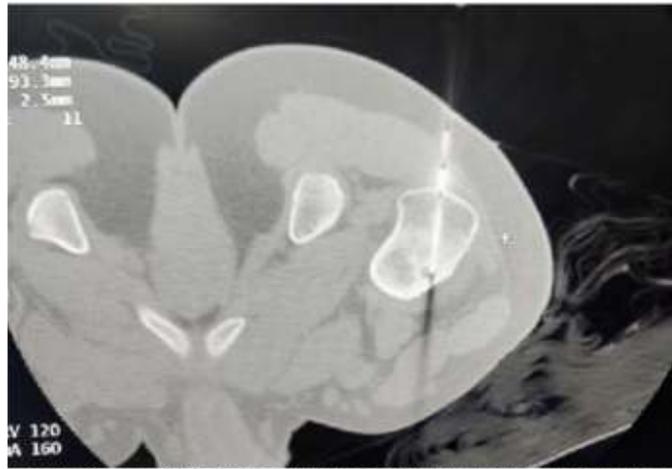


Figure 4: Computed tomography image with electrode at level of lesion



Figure 5: Thermo-ablation with electrode

Inconclusive situations arise more commonly in patients below 11 years of age with location of lesion in the intra-capsular basi-cervical part of femoral neck. On such locations, with different clinical and imaging opinions among clinicians and radiologists, biopsy is recommended⁸. Four intra-capsular neck of femur lesions aged below 11 years were excluded from our study due to different diagnoses among the consultants requiring single or multiple biopsy and change of intervention as necessitated. Percutaneous CT guided radio-frequency ablation in cases of typical presentation, with clinical and imaging conclusive of diagnosis, yields better results and patient compliance^{9,10}.

Chronic hip pain in children below 12 years of age with presentation suggestive of intracapsular femoral neck osteoid osteoma either clinically or radiologically should be screened for contributing pathologies.

Acknowledgements

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