

Case Report

LONG TERM OUTCOME OF A LUMBAR OSTEOLASTOMA: A CASE REPORT

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ABSTRACT

Background: The aim is to assess long term outcome of a lumbar osteoblastoma after total removal under radiodetection.

Case presentation: We report a case of lumbar osteoblastoma in young lady; we use the Enneking staging system for benign musculoskeletal tumors. The patient is an 18 years old girl, low back pain is the principal clinical sign; The patient is evaluated by simple x ray; CT scan and MRI showing a lumbar osteolytic lesion; we use in collaboration with the team of nuclear medicine, the surgical nuclear probe << Europrobe>>.The follow up is 10 years and there is no recurrence after clinical and imaging control.

Conclusion: The peroperative control using the nuclear probe allows the complete total excision of the tumor. Osteoblastoma is a benign tumor requiring a total removal to avoid recurrences.

Keywords: Osteoblastoma; radio detection; Technetium; nuclear probe

INTRODUCTION

The term osteoid osteoma was first used by Jaffe in 1935 to describe a benign bone tumor. Jaffe and Lichtenstein proposed in 1956 the term “benign osteoblastoma” for both tumors (Michael *et al.*, 2016; Li *et al.*, 2013; Poleksic, *et al.*, no date). Osteoblastomas and osteoid osteoma are usually considered as a same pathological entity because they are histologically similar.

Osteoblastoma is a rare benign primary bone tumors accounting about 3% of benign and 1% of primary bone tumors (Michael *et al.*, 2016; Yadav *et al.*, 2015; Li *et al.*, 2013). It occurs in the second to third decades of life. We report a case of bone tumor located on the lumbar spine. The investigations include plain x-rays, CT scan, MRI, technetium bone scan. Total removal of the tumor has been guided by surgical nuclear probe; we assess the outcome of the patient 10 years after the surgery.

CASE

We present a case of an 18 years old girl, student, who consulted for right sided lumbar pain, worse at night and persistent despite analgesics. On the lumbar plain x-rays the right L5 pedicle is not visualized. The Computed Tomography scan (CT) showed a complete lytic image eroding the cortex with calcifications (figure 1).



Figure 1: Axial CT showing a fully lytic image eroding the cortex (black arrow); The margin is not well defined confirming the aggressiveness of the tumor

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The margins were not well defined confirming the aggressiveness of the tumor. On the lumbar MRI there is no extension or effects of tumor on the spinal cord. The day before surgery, the nuclear medicine team injected a bone seeking agent which is uptaken by the osteoblasts (half life of 18 hours). The bone scan done one day before surgical intervention demonstrated an intense focal accumulation of the bone-seeking agent in the right lumbar 5 lamina (figure 2).



Figure 2: Technetium bone scanning demonstrates an intense focal accumulation of the bone-seeking agent on L5

We operated the patient and total excision of the lesion was achieved under the control of surgical nuclear probe. The signal coming from the osteoblastoma was detected and located easily by the surgical nuclear probe. After the initial resection, radioguided check allowed to complete the surgery and excise all possible remnants tissues. We performed a laminectomy and a right L5-S1 stabilization with posterior instrumentation (figure 3).

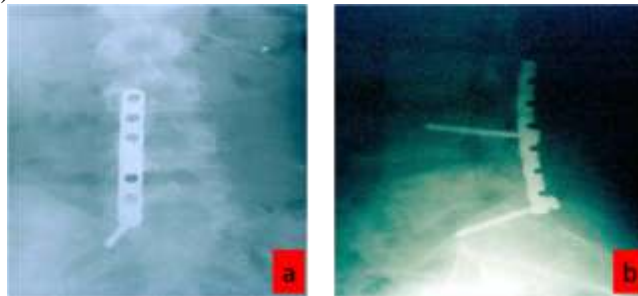


Figure 3: Lumbar X Rays (a: AP; b: lateral) showing the material of fixation after surgery

The histological exam revealed an osteoblastoma. After 10 years of follow up the lady is in a good health free of lumbar pain, she gets married and gives birth to a male baby. The lumbar X-ray shows the material of fixation in place, without recurrence of the tumor (figure 4).



Figure 4: Lumbar X Rays (a: AP, b: lateral) showing the material of fixation 9 years after: no recurrence of the tumor

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DISCUSSION

Osteoblastomas are rare bone tumors, they represent 1% of all bone tumors, and 30 to 40% are localized to the spine. They encompass 10% of all osseous spinal neoplasms (Michael *et al.*, 2016; Yadav *et al.*, 2015). Osteoblastomas tend to predominate in the pediatric population during the second decade of life (Michael *et al.*, 2016; Yadav *et al.*, 2015; MUJAGIĆ *et al.*, 2016; Can Solakoğlu, *et al.*, 2009) which is the case of our patient. The main reported symptom is progressive back pain less likely to be relieved by aspirin or other analgesics (Michael *et al.*, 2016; Yadav *et al.*, 2015; Emmez *et al.*, 2005; Can Solakoğlu, *et al.*, 2009). The tumors involved the posterior elements of the spine (Yadav *et al.*, 2015) like in our case. The most effective treatment for spinal osteoblastoma is total resection of the tumor, to avoid recurrence. In our case the lady is free of pain after 10 years follow up. Spinal decompression therapy needs to be adopted when spinal cord or nerve root compression is present. When the tumor exposure is difficult, a piecemeal resection has to be performed to achieve the necessary extent of resection. Spinal reconstruction is necessary to restore the spinal stability if the lesion involved pedicles facet joints, and anterior segment (Yadav *et al.*, 2015). Radiotherapy and chemotherapy, either alone or combined, may be useful in selected patients with recurrent, aggressive tumors, or in patients with a surgically non-resectable lesion (Yadav *et al.*, 2015; MUJAGIĆ *et al.*, 2016). Osteoblastomas have the possibility of malignant transformation to osteosarcoma, but malignant transformation has only been reported in rare cases (Yadav *et al.*, 2015; MUJAGIĆ *et al.*, 2016). In differential diagnosis of osteoblastoma, osteosarcoma, giant cell tumor and aneurismal bone cyst must be considered. Treatment depends on localization, size and stage of tumor at the time of diagnosis. While in stage 1 (latent phase) or stage 2 (active phase) osteoblastoma, intralesional curettage is advised; marginal or wide resection is required in stage 3 (aggressive phase). Although complete resection of the tumor is essential to prevent recurrence, long term follow up is essential because of high recurrence rate, reported as 10 to 15% of cases (Can Solakoğlu, *et al.*, 2009). Absolute excess risk estimates are necessary to put the risks into perspective with the benefits of the scans. Good evidence from the long-term study of the atomic bomb survivors in Japan suggests that cancer risk persists indefinitely after radiation exposure and most cancer types are inducible by radiation. The most recent risk projections suggest that, for children with normal life expectancy, the lifetime excess risk of any incident cancer for a head CT scan. (With typical dose levels used in the USA) is about one cancer per 1000 head CT scans for young children (<5 years), decreasing to about one cancer per 2000 scans for exposure at age 15 years. For an abdominal or pelvic CT scan, the lifetime risks for children are one cancer per 500 scans irrespective of age at exposure. These absolute excess lifetime cancer risks (to age 100 years) are very small compared with the lifetime risk of developing cancer in the general population, which is about one in three, and are also likely to be small compared with the benefits of the scan, providing it is clinically justified.

Frequent calls have been made to decrease doses, following the as low as reasonably achievable (ALARA) principle and only scan when justified as in the current image gently campaign. In the UK, the Ionizing Radiation (Medical Exposure) Regulations mean that a CT scan should only be done when clinically justified, which might explain the low levels of CT use in the UK compared with other countries that do not have such regulations. The immediate benefits of CT outweigh the long-term risks in many settings and because of CT's diagnostic accuracy and speed of scanning, notably removing the need for anesthesia and sedation in young patients, it will remain in widespread practice for the foreseeable future. Further refinements to allow reduction in CT doses should be a priority, not only for the radiology community but also for manufacturers. Alternative diagnostic procedures that do not involve ionizing radiation exposure, such as ultrasound and MRI might be appropriate in some clinical settings (Mark Pearce, *et al.*, 2012).

CONCLUSION

Osteoblastomas are primary osseous neoplasm with a predilection for the spine. They are rare tumors which may be aggressive, with a tendency to local recurrence and sometimes metastasis. Aggressive

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radical resection is the preferred treatment for these osseous tumors. That can be achieving through a radio guided surgery.

Conflict interest: none

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