Case Report

An alternative method for the treatment of osteoid osteoma

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ABSTRACT

Osteoid osteoma is a small, self-limiting osteogenic tumor. The success of the treatment depends on complete resection or destruction of the nidus. Open excision or en bloc excision was the classical treatment of osteoid osteoma before the development of minimally invasive percutaneous methods. Computed tomography guidance is required in the operating room in most of the percutaneous procedures. This enables accurate localization of the tumor and tumor excision can be performed with less bone tissue resection. We performed an alternative treatment that enables surgeons working in clinics where this equipment does not exist, to perform easy resection of the tumor through a mini incision. Mini incisional surgery seems to be an efficient and reliable treatment for osteoid osteoma.

KEY WORDS: Osteoid Osteoma, Treatment, Minimal surgical procedure.

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INTRODUCTION

Osteoid osteoma is a benign, painful bone tumor with a diameter of <1cm.[1] The pain worsens at night and at rest; the pain is dramatically relieved with non-steroidal anti-inflammatory drugs (NSAIDs) and not related to physical exercise.[2] This tumor comprises approximately 10% of all benign bone tumors. It is most common in the second decade and it is twice more common in males than females.[3] Osteoid osteoma can be treated by conservative and surgical methods. With conservative treatment, it takes almost three years to become asymptomatic. Complete resection or destructive interventions of the nidus are the surgical treatment options.[2]

In this study, a method in which the nidus was completely resected through a small incision in a patient with osteoid osteoma in the proximal left femur has been described.

CASE REPORT AND TECHNIQUE

A 14-year-old male patient presented with the complaint of pain in the left leg that had been persisting for six months. The pain radiated from the left thigh to the left leg. The thigh pain was continuous throughout the day and worsened at night, and could be relieved by aspirin or NSAID. On physical examination, there was limitation of movement in the hip joint, and atrophy in the left thigh and leg. Examinations of the other systems,

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body temperature, ESR, WBC, hemoglobin, serum electrolytes, and alkaline phosphatase levels were all normal. Plain radiographs showed thickening in the medial cortex of the proximal third of the left femur. Computerized tomography (CT) scans demonstrated a round-ecliptic radiolucent calcified medial intracortically-located nidus <1cm in the proximal 1/3 of the femur. After the radiological examination, the lesion was diagnosed to be an osteoid osteoma. Surgery was recommended.

The nidus was completely resected in two stages using our method. In the first stage, the lesion's localization was defined preoperatively using CT-assisted Kirschner wire guidance in the radiology unit. The local anesthetic (2% lidocaine) was injected into the dermis, subdermis and the periosteal layer. Following anesthesia, the Kirschner wire was guided under CT guidance to the targeted nidus in femur from the lateral to the medial thigh (Figure-1). The location of the nidus was defined in CT with the exit point of the Kirschner wire in the medial part of proximal femur, and the operation was planned together with Radiology department.

In the second stage, the patients underwent the operation without removal of the Kirschner wire. A mini incision of approximately 7cm was made in the proximal third - medial thigh. The medial femur was reached through the fascia of the musculus adductor longus and gracilis, and then through adductor magnus and adductor brevis. The tip of the Kirschner wire was found and the localization of the bone which would be resected was defined (Figure-2). The lesion was resected using an osteotome with 7x10 mm bone cortex (Figure-3). The macroscopic examination of the resected material revealed an abnormal bone tissue. The osteoid osteoma-related pain completely resolved after the operation. There were no postoperative complications. It was seen in the CT that the nidus was

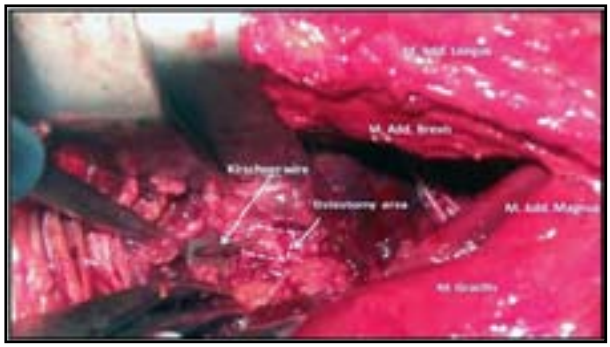

Figure-2: The tip of the Kirschner wire was found and the localization of the bone which would be resected is defined.

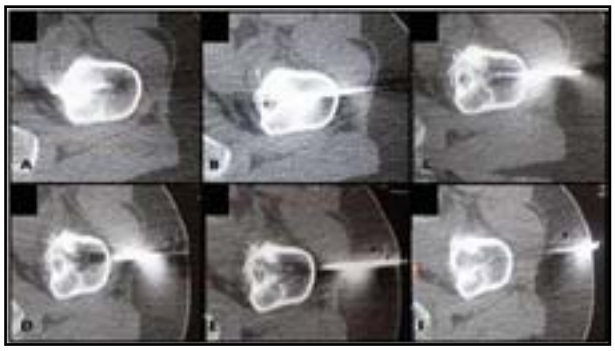

Figure-1: The Kirschner wire was guided under CT guidance to the targeted nidus in femur from the lateral to the medial thigh.

completely removed. The histological examination of the specimen showed the lesion to be an osteoid osteoma.

DISCUSSION

Osteoid osteoma was first defined in 1935 by Jaffe.[4] It usually involves appendicular bones such as the femur, tibia and the humerus.[5] The most common site is the proximal femur.[6] Osteoid osteoma has been classified by Edeiken as cortical, cancellous or subperiostal, according to the location of the nidus. The most common type is the cortical type. Radiological presentation of osteoid osteoma, consists of a annular or oval, lucent lesion of until 10 mm in diameter, called the "nidus", surrounded by a zone of reactive sclerosis.[2] It is an osteolytic tumor surrounded by reactive bone formation. Direct radiography, CT, magnetic resonance imaging, scintigraphy and biopsy can be used in the diagnosis of osteoid osteoma. Osteoid osteoma can be treated conservatively or surgically.[6,7]

Kneisl et al concluded in 1992 that administration of NSAIDs could be as effective as operative excision for the treatment of osteoid osteoma. They advocated conservative treatment, particularly for complex lesions with potentially significant

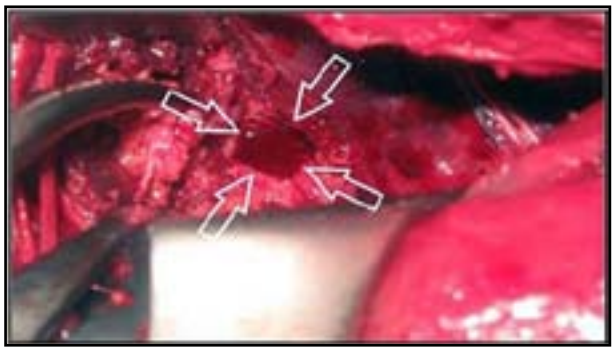

Figure-3: The lesion is resected using an osteotome.

morbidity.[8] However, long-term NSAID use may have significant adverse effects. Therefore, surgery enables more efficient outcomes in the treatment of this disease in a shorter time. The total excision or destruction of nidus is a way of successful treatment of patients with osteoid osteoma. The excision of nidus can be performed by "en bloc" excision of the lesion with the surrounding bone[1], by nidus excision with the bone frame covering the nidus[2] or percutaneous intralesional destruction of nidus with CT guidance. Intralesional destruction is performed by drill, radiofrequency, laser or ethanol.[9-12] Additionally excision of nidus can be unroofing by gradual removal of the overlying reactive bone and excision with curettes and burrs.[1] CT-guided resection or destruction has increasingly gained popularity in previous years.

The most important disadvantage of en bloc excision is inadequacy or failure of the surgical excision of the nidus due to inaccurate localization of the lesion and risk of postoperative fracture due to excess bone cortex resection.[5] Yet, with the method described here, defining nidus localization preoperatively will prevent excess bone resection and the risk of fracture, and will reduce the risk of failure in nidus excision. Despite opinions in the literature that osteoid osteoma can be resected with assisted by C-arm fluoroscopy [13] as in our case, the success rate of the operation can decrease in cases where the nidus cannot be observed in x-ray and C-arm fluoroscopy. The lesion is removed by nidus excision or percutaneous intralesional destruction of the nidus with CT guidance. Intralesional destruction is performed by drill, burr, radiofrequency, laser or ethanol.[9-13]

Exposure of the medial proximal part of the femur, i.e. the region of the lesser trochanter and that part of the femur distal to this, is not easy because of the presence of blood vessels and veins medioventrally and of the thick muscle layer medially and mediodorsally. Thus, in presented technique, determination of the region of osteoid osteoma and excision of the lesion are easier than other technique.

Although this method seems to be the most suitable treatment method, the technical equipment of an operating room may not be adequate for this kind of surgery. Furthermore, in this method in which tomography is used in the operating room, the operation team can be exposed to radiation.

CONCLUSION

In this paper, as the patient's lesion was defined previously in the radiology unit by Kirschner wire, imaging methods were not required during the operation. This technique seems to be an easy and practical method for surgeons working in clinics that possess inadequate equipment.

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