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Osteoid Osteoma of Tibia Treated By Surgical Management Novel Method: A Case Report

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Abstract: Osteoid Osteoma is common benign tumor of the bone. It is commonly seen in the 2nd & 3rd decades, more often between 5-30 years with predilection to males. It involves the appendicular skeleton & the spine more often, rarely the flat bones & unheard in the membranous bones. Predominantly nocturnal pain is the classical symptom relieved with analgesics. Many forms of treatment are available but the classical method of treatment is surgical excision. We at Hassan institute of medical sciences report such a case of osteoid osteoma of tibia in a 17 year old male treated with surgical excision. Patient was pain free with no signs of recurrence after one year too.
Keywords: osteoid osteoma, tibia, night pain, nidus, analgesic relief, surgical management.

INTRODUCTION

Osteoid osteoma is a common osteoblastic tumor benign in nature & common among the young individuals. It usually affects the diaphysis of appendicular skeleton, commonly the femur & tibia. Patient usually presents with dull aching pain which increases during night. The increased pain is due to increased production of prostaglandins. Nidus is the culprit producing extra amounts of prostaglandins. Radiological survey usually shows a nidus within woven bone with a rim of sclerotic bone. The lesion is also mistaken for subacute osteomyelitis or osteoblastoma. But the size of the lesion in osteoid osteoma is usually small varying 1 to 3 cms [1-3]. Isotope scanning shows a double density sign confirming the lesion. Numerous methods of treating osteoid osteoma have been described but the conventional surgical excision of the nidus have proved successful which remains the main stay in managing the lesion. We have reported a case of osteoid osteoma of tibia managed by surgical excision & also review the other methods of management.

CASE REPORT

A 17 year old male came to our orthopaedic out-patient department at Hassan institute of medical sciences with complaints of pain & swelling of the right leg since 3 weeks. He had no history of trauma in the past. He was treated at a local hospital with various different types of analgesics but the patient had only temporary relief of pain. Patient had typical nocturnal pain which was relieved by NSAID's for few hours. Of late the patient had pain during the day time too. Patient had difficulty to walk normally and unable to do any sports activities in his school. From the last two days patient had severity in doing his acts of daily living like sitting on floor or squatting. Patient also had loss of appetite & weight.

On examination there was tenderness of the right tibia at the junction of lower & middle 1/3rd area. A mild swelling was noted measuring about 5 cms with diffuse borders at the same area. It looked like a raised area rather than a swelling [Fig-1]. Muscle wasting was noted at the calf region. Movements of the knee & ankle joints were normal with full & free range. Tenderness aggravated with deep pressure on the bone. There were no engorged veins or visible pulsations.

Routine blood investigation was done which was normal except for a small elevation in the ESR. Conventional radiography showed a small lytic area in the tibia middle 1/3rd area with a speck of nidus in the centre surrounded by a rim of sclerotic bone. The situation was subcortical in nature. Computed tomography was done which showed the lesion to about 2 cms in the middle 1/3rd of tibia with a central nidus a round sclerosis. This also mimicked subacute osteomyelitis. However the radiologist confirmed it to be osteoid osteoma.

The patient was posted for surgery after adequate fitness & clearance from anaesthetist & physician. An anteromedial approach was used [Fig-2].

Fusiform shaped elevation of the bone was noted and bone was shaved using a small guage & an osteotome. The nidus was visualised shortly after several shavings of the cortex [Fig-3]. The nidus was completely excised making a small window in the bone & sent for histo-pathological examination & wound was thoroughly washed & closed in layers [Fig- 4 & 5]. The window made was small & hence did not need any additional support of bone graft. Patient was symptom free post-operatively. He was mobilised after his post operative pain reduced at 36 hrs. Routine 3 doses of antibiotic (Cefaperazone 1.5grams) & analgesics as required were given to the patient. Patient was in-patient for 5 days in our hospital. Suture removal was done on 14th day & wound had healed by primary intention. No form of splintage of POP was used. He was advised to be careful & to avoid sports activities or other strenuous acts for 6 weeks time.

Fig-1: Osteoid osteoma of the diaphysis of tibia

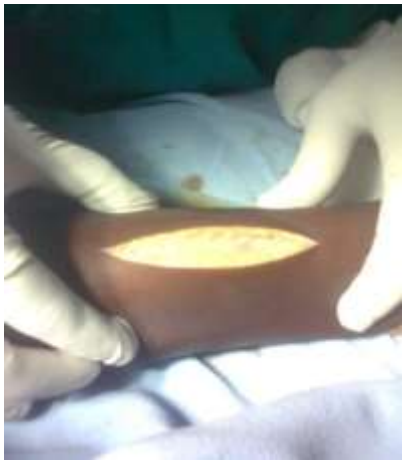

Fig-2:Anteromedial incision.

Fig-3: Nidus visualised

Fig-4: Nidus excised.

Fig-5:Closure of the wound.

Histo-pathological examination confirmed the diagnosis of the osteoid osteoma. Pre-operative pain status completely disappeared after surgery. The patient returned to normal activities by 2 months period. He was able to do all his activities like before.

His last follow-up was 2 years after surgery. He was completely asymptomatic & had now entered college without any significant complaints.

Surgical scar had healed; movements of the joint were full & free with complete return of his calf muscle bulk. No deformities or length discrepancies were noted.

DISCUSSION

Osteoid osteoma is a common benign bone tumor. Its incidence is around 10% of all benign tumors [4-6]**.** The age predilection is around the 2nd & 3rd decade, the adolescent & young adult age group most commonly around 10-30 years of age. However cases at 5th & 6th decade have also been reported [4]. Males are most often affected than the females. Male to female ration is 2:1 [7-10]. It is uncommon in black population. Our case was a 17 year old male.

Osteoid osteoma primarily affects the appendicular skeleton & the spine [11]. Within the bone it localises at the subperiosteal area. It normally is seen in the diaphysis of long bones of femur & tibia. However the metaphysis is also not uncommon. More than 50% of the osteoid osteoma of the long bones arise from femur & tibia. Commonest site is around the hip. Ankle, elbow, wrist & knee are less affected [12]. Epiphyseal involvement of this tumor is a rare occurance but reported [13, 14, 15]. 7%-10% of this tumor occurs in the spine mainly involving the posterior elements [16]. Membranous bones are not affected. Very rarely it may involve the skull too. In our case the lesion was in the diaphysis of the tibia located subperiosteal.

Patient presented with History of mild dull aching pain & a small swelling over the anteromedial aspect of the knee which increased during the night times which is typical in osteoid osteoma [17, 18]. This pain is classically relieved by Non steroidal anti-inflammatory drugs. The pain is due to increased amount of prostaglandin secretion which may amount to more than ten times the normal value. Hence there is an immediate & dramatic relief of pain [19]. Pain can also affect the neighbouring joint resulting in synovitis with radiation done the leg. The pain can also increase on consumption of alcohol & vasodialtion during sports activities. In our patient the pain was characteristically localised to the area with no radiation or joint involvement. The knee & ankle joint had full & free movements. However he had increased pain on days when he played sports. Though the radiographs prove negative without a lesion a strong suspicion about ostoid osteoma should be kept in mind based on the above clinical findings.

Diagnosis of osteoid osteoma can be established with radiographs & CT scan [20]. On an X-ray a typical nidus in the centre of an osteolytic area surrounded by an osteosclerotic rim of reactive bone can be visualised. The nidus is the culprit producing huge amounts of prostaglandins & the cause of pain. Removal of the nidus reduces the pain instantly. The woven bone surrounding the nidus along with the vascular channels is further bound by a thick sclerotic rim of bone. However initial radiographs may not show the nidus & may not prove the diagnosis. Hence repeated radiographs are advised [5]. Secondary radiograph changes may also be noted in form of osteoporosis & deformity. In our case osteoporosis or deformity was not observed. CT scan have a definite role in identifying small lesions especially the nidus [21]. Also the resolution is better in diagnosing the lesion. Furthur in complex anatomies can be better visualised with the use of radioisotope. Technitium 99m is generally used to note the double density sign. Focal accumulation of the radioisotope corresponding to the lesion is usually seen. This gives surgeon a better choice of understanding & managing the lesion [22]. MRI scanning is less useful here as bone is better delineated on a CT scan. But it can not only help note the intramedullary & soft tissue involvement but also help in staging of the tumor. However the cost factor is of concern. Also in intra-articular lesions MRI can be useful [23].

Aim in management of osteoid osteoma revolves in removing the nidus, eliminating the pain & achieving the normal anatomy without complications. Many methods of treatment are available. The usual form of managing this lesion is to surgically excise the nidus. Three main types of removal are decribed. Wide *en-block* resection along with the surrounding bone [1], deroofing the nidus by slowly shaving the overlying reactive bone & excision with curettes [20, 24] & percutaneous CT-guided core-drill excision or by radiofrequency, laser or absolute ethanol [25]. Wide en-block resection removes also normal bones & may make it week requiring additional support & delay in convalescence. Pecutaneous CT-guided removal needs expertise & is done in specialised centres. Deroofing the lesion slowly by gently scrapping the bone layer by layer is the ideal choice. While doing so the nidus may appear as a punctiform reddish cherry coloured spot within the white sclerotic bone. It can also be localised by noting the apex of the lesion & gently scrapping the diaphysis. The nidus usually lies underneath the apex. Sometimes a vessel may spurt out indicating the nidus below. We have also used this technique in removing the nidus. Postoperatively the patient was pain free & immediate mobilisation of the joint could be done. Ambulation can be allowed in this procedure soon after the operative pain reduces. There is also no need of bone grafts or internal fixation unlike *en-block*

resection. Recently percutaneous CT guided core drill excision has been tried with success. Also radiofrequency coagulation, interstitial laser photocoagulation or ethanol injection [20, 21, 25, 26] have been also tried with the advantage of removing thinner & lesser bone. This method can be used in pelvic area & rarely in the lumbar area. Also it has shorter hospital stay however needs expertise. Histologic confirmation could be determined in 40% of the lesions excised in percuatenous method. Follow-up of minimum one year is required to note its recurrence. We had followed up the case upto 18 months with no signs of local recurrence.

In conclusion osteoid osteoma is a tumor most often seen in skeletally immature bone. It is benign in nature with dull aching pain & swelling seen most often in diaphysis of appendicular skeleton. Increased pain during nights typical of this tumor is due to high production of prostaglandins. X-ray & CT scans are used to confirm the diagnosis. Surgical excision in form of deroofing the lesion is the ideal method of treating this condition. Follow-up of one year is a must as osteoid osteoma usually recurs within one year.

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