A Novel Technique for the Treatment of a Rare Atypical Osteoid Osteoma of the Talus

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STATEMENT OF PURPOSE
We herein present a case of delayed diagnosis of an atypical talus osteoid osteoma involving an under reported location of the talus body. In addition, we utilize a novel technique for adulthood bone grafting mixed with an Acellular Connective Tissue Matrix (ACTM) as a viable treatment option.

LITERATURE REVIEW
Osteoid osteoma is a small benign, self-cannibalized tumor of bone that was first described by Jaffe in 1935. (1) It often occurs in the diaphysis of long bones, such as the femur or tibia and represents approximately 10% of all benign bone tumors. (2) It is more commonly seen in males, with peak incidence in the first 3 decades of life. (3) The etiology is unknown, but a genetic factor may be involved. The pain associated with osteoid osteoma is typically relieved by anti-inflammatory medications. In addition, clinical presentation can be misleading, and the lesion is often incidental in nature. Radiographic findings may be subtle and non-diagnostic, with imaging studies sometimes failing to reveal significant findings. This case study details our treatment of a rarely reported atypical osteoid osteoma of the talus.

CASE STUDY
21-year old Spanish-speaking Hispanic male with a non-complaint prior medical history presented with a 3-month history of left medial ankle pain that was initially painful with weight bearing. Follow up imaging with computed tomography at four months postoperatively revealed no change in the size or intensity of the lesion (Fig. 1). Patient was able to return to his prior level of activity.[1]

RESULTS
A. 21-year old Spanish-speaking Hispanic male with a non-complaint prior medical history presented with a 3-month history of left medial ankle pain that was initially painful with weight bearing. Follow up imaging with computed tomography at four months postoperatively revealed no change in the size or intensity of the lesion (Fig. 1). Patient was able to return to his prior level of activity.

FIGURES

REFERENCES
Osteoid osteoma typically presents with localized pain that is most severe at night and can be relieved by pain medication and anti-inflammatory agents. Depending on the location of the bony lesion, patients may present with local swelling and tenderness, bony deformity, joint limitation or motion, or in some instances, no symptoms. (4) Because of its often subtle clinical presentation, the diagnosis of peripheral osteoid ostetomas will be a challenge for most clinicians. (5) While clinical symptoms and pain progress and fail to improve, medications and conservative care, surgical treatment options need to be considered. For this case, a standard talus osteotomy was performed with elimination of excision and debridement of the defect in an attempt to achieve pain relief.


Due to the unconfirmed diagnosis with advanced imaging, the patient was consented for staged excision and curettage of the lesion. The patient agreed to the procedure with ACTM augmentation. The patient initially underwent a medial malleolar osteotomy again fixated with 4.0 mm screws. Pathology results were consistent with atypical presentation of an osteoid osteoma of the talus with clean margins. The patient was subsequently consented for bone grafting and repair of the talus. The patient was subsequently referred to our clinic for surgical evaluation after medical history use was referred to our clinic for surgical evaluation after medical history use. The patient elected to undergo ACTM augmentation of the talus with hydroxyapatite particles. Biomaterials. 2007;28:400-412.


The biocompatibility of Acellular Connective Tissue Matrix (ACTM) with human osteoblasts in vitro and the adhesion, proliferation, and osteogenic ability of osteoblasts on ACTM have been demonstrated in previous studies. However, the biocompatibility of ACTM in vivo has yet to be adequately studied. ACTM is a hydrophilic acellular extracellular matrix, which is derived from human dermal fibroblasts. ACTM has been used in orthopedic surgery for over 15 years and has been demonstrated to promote osteogenic activity in vivo. The present study investigated the effect of ACTM on osteoblast activity in vitro and in vivo. The results of the present study demonstrated the following: (1) The presence of ACTM significantly promoted osteoblast proliferation and differentiation in vitro and in vivo. (2) The osteoblast activity on ACTM was greater than that on the control surface. (3) The osteoblasts on ACTM exhibited increased alkaline phosphatase activity and increased osteogenic activity in vivo. (4) The osteoblasts on ACTM exhibited increased bone formation in vivo.

This case study details our treatment of a rarely reported atypical osteoid osteoma involving the talus body. To our knowledge, examples of these tumors being treated in the talus body are rare and there is no standard surgical excision and repair utilizing an ACTM. Extended curettage is the most common mode of treatment of the talus-based bone tumours with a reported success rate of 90% (5). Figure of biopsy ingrowth, and clinical observation and improvement of bone grafts or substitutes, bone graft substitutes like calcium phosphate and hydroxyapatite are available but their performance with inflammatory and immunological reactions is concerning, and their efficacy is also questionable (4,15).

Autografts are three diseases transmission or immunological reactions and have ideal properties of osteoconduction, osteoinduction, and osteogenesis. However, the potency of autografts is limited and the healing process is slow. In addition, complications related to the use of autografts have been reported, including donor site morbidity and loss of bone height. To help overcome these variables, augmentation with an extracellular matrix has been shown to be effective in promoting bone regeneration and remodeling. (6,7) Acellular Connective Tissue Matrix (ACTM) is a non-steroidal anti-inflammatory, non-steroidal anti-inflammation, and non-steroidal anti-inflammation. The medial malleolar osteotomy was again fixated with 4.0 mm screws. Pathology results were consistent with atypical presentation of an osteoid osteoma of the talus with clean margins.

Involvement of toll-like receptor 4 (TLR4) in the pathogenesis of osteoid osteoma. (8) These tumors are a rare entity with limited studies and research, particularly when presented in the setting of a cortical bony lesion. The medial malleolar osteotomy was again fixated with 4.0 mm screws. Pathology results were consistent with atypical presentation of an osteoid osteoma of the talus with clean margins.

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