

## SAMPLE POSTER (CASE)

### UNDIAGNOSED UNICAMERAL BONE CYST IN A PEDIATRIC PATIENT TREATED WITH EXCISION AND ALLOGRAFT: A CASE REPORT John Smith, DPM, Jane Doe DPM, Herbert Hoover, DPM.

#### STATEMENT OF PURPOSE

The following case report outlines the treatment of a 10-year old female with chronic heel pain 1-year in duration. Prior to presentation to our office, the patient failed conservative treatment by 4 physicians. The patient noted vague, aching heel pain with walking and without a history of trauma to the area. After further radiographic and MRI evaluations, the patient was found to have a Unicameral Bone Cyst in the calcaneus and subsequently underwent operative intervention.

We present this case to underline the importance of a complete and thorough evaluation of the pediatric patient with unresolved heel pain without a history of trauma. In addition, excision and filling of the lesion with allograft was selected over percutaneous options given the patients clinical symptoms and a high likelihood of pathologic fracture due to patient body habitus and the size of the lesion.

#### LITERATURE REVIEW

Unicameral bone cysts (UBC), also referred to as simple bone cysts or solitary bone cysts, are benign, fluid filled bone defects typically found in children or adolescents.<sup>1,8,10,14,16,19</sup> The lesions occur most commonly in the femur and humerus, with the calcaneus ranking as the sixth most common site for the lesion.<sup>9,13,15,17</sup> Unicameral bone cysts comprise roughly 3% of all bone lesions, with a male to female ratio of 2:1.<sup>2,7,8,10,18</sup> Several theories have been described as to the pathogenesis of unicameral bone cysts but the etiology remains subject to discussion. Proposed etiologies include trauma, inflammation and dysplasia, venous obstruction, genetic causes, and increases in intra-cavity osseous pressure.<sup>1,7,10,18</sup>

Although many lesions present as incidental findings on radiographs, patients may also present with pain and possible pathological fracture at the site of the lesion.<sup>4-6,13,16</sup> Many treatment options have been advocated for unicameral bone cysts, with significant discrepancy in the literature as to the gold standard.<sup>2,4-8,11,19</sup> Literature on unicameral bone cysts splits treatment options into steroid treatment and operative treatment. Literature focusing on treatment of unicameral bone cysts in the calcaneus is limited secondary to its low incidence in this location. Many authors advocate surgical treatment of calcaneal lesions even when asymptomatic secondary to the high weight-bearing load of the calcaneus and thus, an increased risk for pathologic fracture.<sup>9</sup> Other authors argue that asymptomatic lesions warrant non-operative treatment as they typically remain asymptomatic and do not enlarge.<sup>18</sup>

#### LITERATURE REVIEW (CONTINUED)

The current trend for treatment of symptomatic unicameral bone cysts of the calcaneus is for backfilling the lesions with allograft in an open or percutaneous fashion.<sup>12,14,17,19</sup> Recently a technique of endoscopic curettage and percutaneous allograft filling was described with promising results.<sup>19</sup> Although we agree percutaneous techniques are advantageous in their small incisions and decreased dissection, we chose an open approach in our patient secondary to the vast size of the lesion. We advocate the importance of filling the calcaneal defect with a bone graft substitute to prevent future pathological fracture.

#### OPERATIVE INTERVENTION

The patient presented to our office after a year of treatment by multiple other physicians for unresolved heel pain to the right side. Given the absence of a history of trauma, radiographs (Figure 1) followed by an MRI (Figure 2) were ordered to rule-out any additional pathology not previously identified.

A UBC was identified, and surgical excision with allograft fill was recommended and performed through an open approach. A lateral cortical window was created with an osteotome to access the lesion. This was secured with a staple following evacuation of the lesion and backfilling with allograft (Figure 3A,B).

Six weeks after the procedure the patient was transitioned from non-weight bearing to full weight-bearing in a Controlled Ankle Motion (CAM) boot and at nine weeks, was transitioned to normal shoe wear with activity increases to tolerance. Lateral radiographs immediately post-operative and at 9 months post-operatively demonstrate allograft at the previous cyst cavity as well as staple placement across the lateral cortical window, anterior to the growth plate (Figure 4A,B).



Figure 1: Initial radiograph reveals a large cystic area located in the neutral triangle of the calcaneus.

#### OPERATIVE INTERVENTION (CONTINUED)

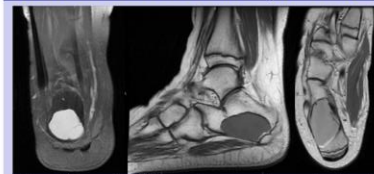


Figure 2: Pre-operative MRI revealed a unicameral bone cyst involving the calcaneus without fracture or other pathology.



Figure 3: Intraoperative photographs demonstrating: A-Cortical window for evacuation of the lesion, and B-allograft fill into the cavity.

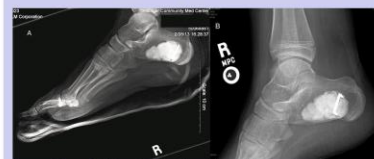


Figure 4: Lateral radiographs: A-immediately post-operative, and B-at nine months post-operative.

#### OUTCOMES

11 months status post surgical excision with allograft fill of the unicameral bone cyst in the right calcaneus, the patient has improved ACFAS and AOFAS scores. Pre-operative ACFAS score was 69 (Fair) and post-operatively improved to 86 (Excellent). Pre-operative AOFAS score was 47 (Fair) and post-operatively improved to 80 (Good).

The patient currently ambulates without a noticeable gait disturbance, can tolerate walking longer distances and has no limitations to her daily activities, which is a vast improvement from her pre-operative status. The patient still complains of some residual discomfort and limitation with high intensity recreational activities but overall is very satisfied with her outcomes.

#### DISCUSSION

Unicameral bone cysts comprise 3% of all bone lesions, and should be suspected in the pediatric patient with unresolved, unexplained pain without a history of trauma. It is important that obese pediatric patients who complain of pain are investigated thoroughly to assure whether their body habitus is, or is not, the reason for their lower extremity pain. In our patient, she had been seen and treated by several physicians without success, all of whom contributed her pain to obesity. It wasn't until we investigated further that the UBC was discovered and treated.

Controversy exists on the best treatment option for patients with UBC's. Considering our patient's clinical symptoms, high likelihood of pathologic fracture due to body habitus, and the size of the lesion, open excision and backfilling of the lesion with allograft was selected as the

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