HEEL PAIN IN A YOUNG ADOLESCENT BASEBALL PLAYER

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ABSTRACT

Objective: This case report describes a young adolescent baseball player with right heel pain.

Clinical Features: An 11 year old male baseball player experiencing right medial calcaneal pain of several days duration. Running increased his pain and he had suffered mild pain in this area 1 year previously. He experienced tenderness to palpation over the right posterior-medial calcaneus and mild pain on toe walking.

Intervention and Outcome: The patient was treated with gentle mobilization to the ankle mortice, subtalar, and fore foot areas and electrical stimulation and ice to the calcaneal area. The patient was instructed in stretching of the Achilles tendon and plantar fascia and the use of ice application intermittently especially after aggravating activity.

Conclusion: The patient had right posterior medial heel pain that was aggravated by running and responded well to physical therapy modalities, stretching and mild modification of aggravating activity. This case illustrates that it is important to consider and recognize early calcaneal apophysitis in the adolescent and prompt conservative treatment generally produces excellent result. (J Chiropr Med 2004;3:66–68)

KEY WORDS: Adolescence; Athletic Injuries; Calcaneus Cryotherapy; Exercise; Heel Sports

INTRODUCTION

Sever's disease, also known as calcaneal apophysitis, is a common complaint in young athletes, most commonly in young males. The age of onset is typically 9 to 14 years. Plantar fasciitis is often a common diagnosis for subcalcaneal pain. Due to the close anatomical relationship of the subcalcaneal structures it may be an oversimplification to assume that pain arises solely from inflammation of the plantar fasciitis (1). Sever's disease was originally described as an inflammation of the

apophyseal growth plate of the calcaneus (2). The disorder has been classified among the general osteochondrosis syndromes such as Legg-Calve-Perthes disease at the hip and Osgood-Schlatter disease at the tibial tuberosity (3).

The crescent-shaped calcaneal apophysis typically begins ossifying in females at 4 to 6 years of age, fusing at approximately age 16. In males, ossification occurs between ages 5 and 9, fusing at approximately age 20. During the normal course of ossification and fusion, the apophysis may appear sclerotic, irregular and fragmented with increased density of the apophysis (4). Thus, some debate the existence of Sever's as a true disease. This also demonstrates that the diagnosis should not be based on radiographic findings alone (5). The symptoms may also be nearly identical to those of plantar fasciitis although occurring in the skeletally immature patient (6).

CASE REPORT

History: An 11 year old male baseball player presented with right heel pain of approximately 3 days duration. He described similar but milder symptoms 1 year ago during baseball season. The patient's mother at that time stated that because of his mild symptoms that they had not sought medical care and the symptoms resolved on their own. His pain was aggravated by running during baseball practice and was mildly relieved at rest with non-weight bearing. The patient had continued to practice with continued and worsening of the initial pain. The patient denied any other health problems and only previous treatment for his heel pain was warm water soaks with Epsom salts the previous day. His mother stated he was wearing non-cleated athletic shoes during the early practice season.

Examination: This patient was a well developed 11 year old male in no acute distress. He exhibited a normal gait with no visible limp. The calcaneal area appeared non-edematous with no visible deformity or ecchymosis present. There was moderate tenderness to palpation over the medial calcaneus. There was moderate tenderness to palpation over the medial calcaneus. The patient was able to heel walk and toe walk although this produced considerable pain over the right medial heel. Thompson's test to examine the integrity of the Achilles

tendon was negative bilaterally. Anterior drawer tests of both ankles showed the anterior talo-fibular ligaments to be equally intact. Active range of motion in plantar and dorsi flexion was complete as was inversion and eversion. AP and Lateral X-rays were performed on the right hind foot. These revealed a mildly sclerotic irregular calcaneal apophysis typical of calcaneal apophysitis. The bones of the hind-foot revealed good mineralization with no apparent fractures, dislocations or degenerative changes present. (Figure 1)

Management: Treatment consisted of gentle mobilization to the subtalar and forefoot area to alleviate mild fixations present in the subtalar joint area and medial forefoot. Dynamic thrusts technique was done to the ankle with the foot placed in full dorsiflexion and eversion to correct a palpable fixation in the ankle mortise

Figure 1 & 2. AP and Lateral views of the calcaneus show a somewhat irregular apophysis.

area. Cold packs and electrical stimulation in the form of Russian stimulation sine wave modulated at 2500 Hz with a 12 second on time and an 8 second off time with a 3 second ramp were administered to the painful area. The patient was instructed to perform gentle stretching exercises to the Achilles tendon and plantar fascia. The patient responded well to this office and home treatment regime and was able to resume normal baseball activity within one week.

Discussion: Sever's disease seen in the young adolescent athlete is essentially a traction apophysitis occurring to the os calcis (7). Although it is often described as a self limiting disorder (5) conservative treatment following early diagnosis may accelerate the return of the young athlete to full activity. For this reason the athlete was treated with cryotherapy and electrical stimulation to combat the early inflammatory process. Gentle mobilization to the ankle mortise, subtalar joint and forefoot were performed to restore any aberrant biomechanical fixations.

Although there is a limited amount of printed literature on manipulation for calcaneal apophysitis there are a few case reports of manipulation for plantar fasciitis. (8) Further studies would be beneficial to test the efficacy of manipulation of the hind foot in the cases of calcaneal apophysitis. Further diagnostic imaging of persistent cases may include bone scanning to reveal possible stress fractures of the calcaneus (9).

Some authors have attempted to link the use of certain cleated shoes to predisposing the young athlete to Sever's disease (10). Athletic shoes with substantial forefoot cleats placing the ankle in a mild dorsiflexed position may increase the amount of pressure placed on the calcaneal apophysis from soft tissue pull of the Achilles tendon and plantar fascia. For this reason heel lifts may also be beneficial to the athlete (11). Gentle stretching exercises to the Achilles tendon and plantar fascia were also recommended to the athlete to relieve the pressure on the os calcis. See Table 1 for differential diagnoses.

Limitations: Although favorable results were obtained with this patient this case study had some limitations in case management. The patient had one mild episode of heel pain one year previous and was seen in our office within a few days of the second more severe episode. Prompt treatment of this case may have avoided any chronicity of symptoms hence allowing the athlete to return to full activity sooner with fewer restrictions. Had the patient been seen later into his symptom stage it is possible a much longer treatment and activity modification phase would have been required.

TABLE 1
DIFFERENTIAL DIAGNOSIS: DIFFERENTIAL DIAGNOSES TO CONSIDER IN THE YOUNG ACTIVE ATHELETE COMPLAINING OF HEEL PAIN.

	CALCANEAL HEEL SPUR	CALCANEAL FRACTURE	CALCANEAL PERIOSTITIS	PLANTAR FASCITIS	TRACTION APOPHYSITIS OF OS CALCIS
PHYSICAL EXAMINATION FINDINGS	SUBCALCANEAL PAIN COMMON IN OBESE OR HIGHLY ACTIVE INDIVIDUALS	PAIN OVER THE HEEL SWELLING AT HIND-FOOT DIFFICULTY IN WEIGHT BEARING HISTORY OF AXIAL LOADING	EXTREME TENDERNESS AT OS CALCIS ONLY MILD SWELLING OVER HEEL PAD, IF PRESENT AT ALL DIFFICULTY IN WEIGHT BEARING	PALPABLE PAIN AT MEDIAL TUBERCLE HINDFOOT, HEEL-CORD INFLEXIBILITY PAINFUL WEIGHT BEARING, ESPECIALLY ON WAKENING NEED TO RULE OUT PES PLANUS, HYPERPRONATION	PALPABLE TENDERNESS AT OS CALCIS PAIN AT ACHILLES' TENDON-APOPHYSIS PAINFUL RUNNING OR JUMPING REPRODUCTION OF DISCOMFORT ON DORSIFLEXION OF ANKLE
X-RAY FINDINGS	AXIAL PROJECTION LATERAL PROJECTION BEST FOR VISUALIZING HORIZONTAL ORIENTATION OF SPUR	ANTEROPOSTERIOR, LATERAL AXIAL MORTISE VIEWS NEED TO RULE OUT VARIOUS POSSIBLE FRACTURE SITES	NORMAL	POSSIBLE CONCOMITANT HEEL SPUR	NEED TO RULE OUT FRAGMENTATION AND IRREGULARITY OF CALCANEAL APOPHYSIS
TREATMENT PLAN	ICE MASSAGE PROPER FOOTWEAR, HEEL CUP OR PADS UNDERWATER ULTRASOUND INJECTION OF CORTI- COSTEROID WITH ANESTHETIC, IF CONDITION IS REFRACTORY TO CONSERVATIVE THERAPY	REFERRAL TO ORTHOPEDIC SURGEON POSSIBLY, COMPUTED TOMOGRAPHY FOR FURTHER EVALUATION	USE OF CRUTCHES FOR 5-7 DAYS ELEVATION FOLLOW-UP RADIOLOGIC EXAMINATION, IF PAIN DOES NOT SUBSIDE WITHIN 1 WEEK	ICE MASSAGE ULTRASOUND THERAPY ARCH EXERCISES STRETCHING OF HEEL- CORD AND PLANTAR FASCIA USE OF HEEL CUPS, PADS ACTIVE REST	APPLICATION OF ICE ACTIVITY MODIFICATION GENTLE RESTORATION OF ACHILLE'S TENDON FLEXIBILITY

(FROM BRIER S PRIMARY CARE ORTHOPEDICS TABLE 11-10 REPRODUCED BY PERMISSION MOSBY PUBLISHING)

Conclusion: Sever's disease should be considered in any heel pain in the adolescent athlete. With prompt differential diagnosis and treatment the athlete may be able to return to full activity with only a short period of activity modification. Controlled studies of athletic footwear may also demonstrate clinical information in avoiding this condition.

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