

# Unusual Recovery Rate of Sartorius Avulsion Fracture in an Athlete Abusing Anabolic Steroids

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**S**ARTORIUS AVULSION FRACTURES are common in adolescent athletes and usually occur from age 15 to 17, before closure of the apophysis (Combs, 1994; Kujala, Orava, Karpakka, Leppavuori, & Mattila, 1996; Stevens, El-Khoury, Kathol, Brandser, & Chow, 1999). Avulsion injuries can occur when a muscle significantly increases in contractile strength and the musculotendinous unit pulls on its bony connection. As a result of the bone being weaker than the muscle before closure of the apophysis, this great tensile load of the musculotendinous unit produces an avulsion fracture (Ruane & Rossi, 1998). Hip avulsions are typically caused by an unexpected, explosive contraction of the hip muscles, uncoordinated actions during athletic endeavors, or, much more rarely, direct trauma (Combs; Ruane & Rossi; Stevens et al.). The risk of avulsion injuries increases in teenage athletes who abuse anabolic steroids. The following case study reports on a 19-year-old high school football player abusing two types of anabolic steroids who recovered from a sartorius avulsion fracture with relatively little rehabilitation over a short period of time.

## Case History

A 19-year-old linebacker, 188 cm (6 ft, 2 in.), 94 kg (205 lb), sustained an injury to his right hip during tackling drills. While going through a high-stepping drill, the athlete was hit in the right hip by an oppos-

ing player's helmet. He attempted to continue the drill but could not because of extreme pain. Mechanism of injury was unclear—the athlete heard no pop nor felt any strain or other abnormal feeling except for pain. Compressive force from the opposing player's helmet and muscular tensile force from the explosive movement of high stepping seemed to have contributed to the injury.

Initial examination revealed point tenderness both superior and anterior to the right iliac crest. Minimal swelling was present, and pain radiated around the anterior superior iliac spine. Further assessment indicated an extreme deficit in range of motion during hip flexion/extension, abduction/adduction, and external rotation. Pain increased during manual muscle testing of the sartorius. The athlete was removed from practice, and ice was applied with a compression wrap to the injured hip. He was fitted for crutches and transported to the local medical center.

Orthopedic and X-ray examinations revealed an acute sartorius avulsion fracture with closed apophyseal joints (Figure 1). The athlete was removed from physical activity for 3 weeks, placed on crutches, and prescribed 7.5 mg of Lortab® for pain as needed. Immediately after the injury, the athlete had his wisdom teeth removed and was bedridden for a few days. After recovering from the dental surgery, he began to bear weight and do normal weight-bearing activities against the physician's orders. Three weeks after the injury, X rays were retaken. These showed a solid



**Figure 1** X ray illustrating a sartorius avulsion at its origin. This is evident in the upper left corner as indicated by the bony fragment.

union at the fracture site. The athlete was pain free on palpation along the rim of the pelvis over the anterior superior iliac spine.

The standard time of recovery from this type of injury is generally 4–6 weeks (Ruane & Rossi, 1998). Even though the physician was impressed with the healing, the athlete was prescribed physical therapy. Initially, it incorporated electric muscle stimulation and ice. Therapeutic exercise was introduced to increase flexibility, range of motion, proprioception, strength, and endurance. The exercises used during the rehabilitation period consisted of a treadmill warm-up; stretching the hip flexors, quadriceps, and adductors; and strengthening the lower body by means of active flexion, adduction, and abduction and wall squats, leg extensions, hamstring curls, and functional exercises (hopping, cutting, balancing) for 10 min. After the initial therapy visit, the athlete failed to return to therapy for 9 days. He then returned and attended three sessions over 6 days, after which he was released to participate as approved by the therapist and physician. Total recovery time was 34 days with only three sessions of active physical therapy.

When the athlete returned to football, a postinjury survey was performed. Because of the nature of the injury, he was asked whether steroid abuse was involved. He admitted to using Sustanon® 250, which is composed of four different testosterone (testosterone propionate, phenylpropionate, isocaproate, and decanoate), and Deca-Durabolin® (nandrolone decanoate). The athlete verified that the anabolic steroids were being administered by injection during the recovery and up to the time of the first physical therapy visit, which was 31 days after the initial injury. In addition, he had used two anabolic steroids

for 5 weeks before the injury occurred. Since the initial injury, the athlete has not had any recurring problems with the affected hip but has developed recurring hamstring strains in the same leg. Questions concerning nutritional status and use of other dietary supplements revealed that he was taking creatine, androstenedione, Ripped Fuel®, ECA Stack™, and protein powders on a regular basis.

## Discussion

Determining whether or not an athlete is using anabolic steroids is sometimes challenging. An athlete's appearance is most often the first clue. Getting the athlete to admit to using anabolic steroids can be quite difficult. The first step is to ask him or her if anabolic steroid use has occurred. Although this might come with some resistance, a level of trust needs to be established between the athletic trainer or therapist and the athlete. If the athlete refuses to speak about anabolic steroid abuse, he or she should be referred to a counselor or team physician. If the athlete does admit to abuse, the following approach is suggested: The athlete should be referred for one-on-one counseling with a substance-abuse professional. This counseling should be nonjudgmental, nonaccusatory, and factual. Discussion of fair play in sports, legal risks, and the health benefits and risks of using anabolic steroids should also be part of the counseling process (Fuentes, 1999). Anabolic steroid use, possession, and distribution are illegal and can result in jail time and other penalties.

Sports health-care professionals who work with athletes should be aware of what to look for when suspicions arise concerning anabolic steroid use and abuse (see the sidebar). In general, athletic trainers and therapists, coaches, and all those who work with athletes should look for the more common signs of anabolic steroid use, such as a rapid increase in size, aggression, excessive acne, edema, needle marks in large muscle groups, and increased susceptibility to tendon strains and injuries. In this case, the athlete had a rapid increase in weight over the summer of approximately 18 lb and had recently strained a hamstring before the avulsion fracture of the hip.

Before anabolic steroid use becomes a problem, athletes should be taught about the alternatives to steroids. Coaches and athletic trainers and therapists need to provide athletes with proper nutrition and weight-