

Osgood-Schlatter Disease in an Adult Athlete: A Case Report and Review of the Literature

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Abstract

Background: Osgood-Schlatter disease (OSD), a form of traction apophysitis, predominantly affects adolescents engaged in high-impact activities. While conservative management is often effective, surgical intervention becomes necessary in refractory cases.

Case Report: A 29-year-old male athlete with persistent OSD symptoms underwent arthroscopic surgery after unsuccessful non-surgical treatments. Arthroscopic removal of the bony particle was undertaken using six portals with a novel setting (consisting of medial and lateral superior, standard, and inferior portals) to minimize the damage to the patellar tendon and intermeniscal ligaments. This setting of portals also obviates the need for fluoroscopy since it provides adequate visualization for confirmation of complete removal of the bony particle. The lower portals also provide more convenient access to the bony particle, minimizing the possibility of incomplete removal and persistence of symptoms. The patient experienced complete resolution of anterior knee pain and prominence within six months post-surgery. Arthroscopic removal of the ossicle involved the use of superior portals for optimal access and visualization. Low portals were strategically employed to eliminate the need for fluoroscopy, offering a unique advantage. Postoperative rehabilitation included immobilization followed by a gradual return to weight-bearing and full range of motion (ROM).

Conclusion: Arthroscopic removal remains the preferred method for treating OSD, emphasizing fewer complications. However, challenges related to limited access and anatomical restoration persist.

Keywords: Arthroscopic Surgery; Case Reports; Osgood-Schlatter Disease; Traction

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Background

The condition known as Osgood-Schlatter disease (OSD) mainly affects male adolescents aged 12-15 and girls aged 8-13 who participate in high levels of jumping or running activities (1). OSD is a type of traction apophysitis of the anterior tibial tuberosity that usually resolves following apophyseal closure, but in some cases, it may persist into adulthood as a separated ossicle (2). Although conservative management is typically sufficient, some cases may require surgical removal. Both open and arthroscopic methods have been proposed in the literature, with arthroscopic removal resulting in fewer complications and better outcomes (2, 3). This case report describes a patient with adult OSD who underwent arthroscopic surgery using a novel combination of portals after non-surgical treatments proved ineffective. The patient experienced satisfactory clinical and radiological results following the procedure.

Case Report

A 29-year-old male athlete presented with a painful bump in the anterior knee that had been present since adolescence. The symptoms had worsened over the past few months and were aggravated by jumping and running activities. Despite undergoing ten physiotherapy sessions

and taking anti-inflammatory medications, the pain persisted. Physical examination revealed a hard, mobile 3 cm × 3 cm prominence at the tibial tuberosity that was tender to the touch (Figure 1).

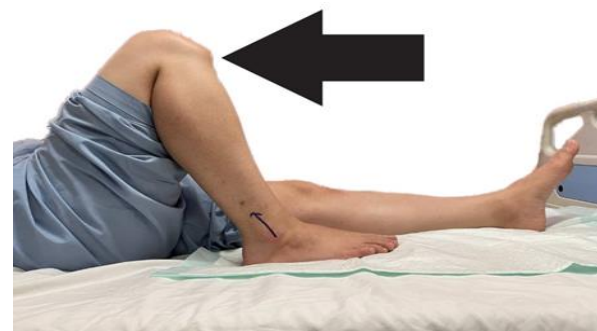


Figure 1. The preoperative clinical picture of the patient's knee demonstrating the bump anterior to tibial tuberosity

Lateral radiography revealed a separated bony particle of 25 mm × 18 mm in front of the tibial tuberosity that was embedded within the patellar tendon (Figure 2A). Magnetic resonance imaging (MRI) showed signs of inflammation of the patellar tendon close to its insertion on the tibial tuberosity (Figure 2A).

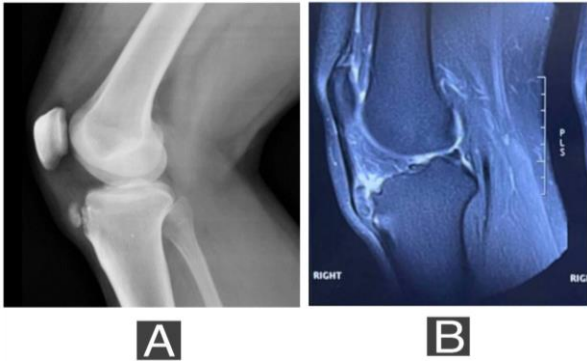


Figure 2. A) Lateral plain radiography showing the separated bony particle in front of the tibial tuberosity; B) Magnetic resonance imaging (MRI) revealing the ossicle and signs of patellar tendon inflammation

Surgical Intervention

Diagnostic arthroscopy was performed using standard anterolateral (AL) and anteromedial (AM) portals, each located 1 cm lateral and medial to the patellar tendon through soft points, respectively. Following this, the ossicle removal procedure began through two superior AL and AM portals, each located 2.5 cm superior and 1 cm lateral and medial to the patella, respectively, while the knee was in full extension to provide more working space between the tibia and patellar tendon. The incisions were made horizontally to achieve better cosmetic results. The motorized shaver was introduced in the extracapsular space and lateral gutter of the knee through the superior AL portal. The fat pad behind the patellar tendon was then debrided from proximal to distal to release the ossicle. The superior positioning of these portals allowed for better access and visualization of the patellar tendon while minimizing the risk of damage to the tendon during the fat pad shaving process. Two additional portals of low AL and low AM were opened to access the ossicle from the lateral side through the low AL portal. These portals entered the extracapsular space just adjacent and superior to the ossicle. The ossicle was then removed under direct visualization through the low AM portal to ensure complete removal.

Postoperative Rehabilitation

Following the surgery, the patient's knee was immobilized using a knee immobilizer device. Partial weight-bearing was allowed using crutches for two weeks, after which full weight-bearing and range of motion (ROM) were permitted. The patient's anterior knee pain and prominence symptoms were completely resolved within six months of the surgery, as confirmed by the six-month follow-up examination and radiology (Figure 3).



Figure 3. Postoperative lateral radiography showing complete removal of the ossicle

Discussion

OSD is a common cause of knee pain among skeletally immature adolescents, especially those who participate in sports (1). This condition results from repetitive traction over the attachment site of the patellar tendon to the tibial tuberosity in patients whose apophyses are not yet fully attached to the tibial epiphysis, as shown in figure 3 (2). This traction can sometimes cause microfractures and separation of the apophysis before it fuses with the epiphysis of the tibia, resulting in an isolated ossicle (4). While symptoms typically resolve within two years with conservative treatments before complete skeletal maturity, some studies have reported continued pain and limitations in certain activities, such as kneeling, beyond this period. This suggests that the morbidity caused by OSD may be underestimated (2, 5, 6).

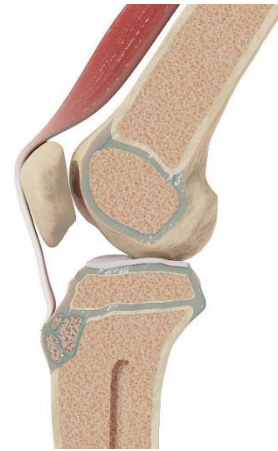


Figure 4. A schematic view of tibial tubercle apophysis and proximal tibial epiphysis

If OSD symptoms persist after two years of sports restriction, physiotherapy, and analgesic use, or if they are already too debilitating for the desired level of activity for the patient, surgical treatment may be recommended (7, 8). However, surgery is generally not recommended for adolescents to prevent progression into genu recurvatum (5, 9).

The most widely accepted surgical method for treating an ossicle is its removal from within the patellar tendon, either with or without curettage of the tubercle. This can be done via open surgery or arthroscopically. Other surgical techniques, such as drilling, fixating, and fusing the ossicle to the tubercle, have been compared to removal but are considered inadequate because they do not address the prominence or the underlying issue. Removal of the ossicle, on the other hand, has been shown to produce better functional and cosmetic outcomes (3, 9). In recent years, arthroscopic methods have gained popularity for removing the ossicle. Unlike open surgery, arthroscopic removal does not require the surgeon to make a vertical incision through the patellar tendon to access the ossicle, and complications such as incision site pain, infection, and nerve damage are less likely to occur following the procedure (10, 11).

Fluoroscopy is typically used to ensure the complete removal of ossicle residuals. However, in this case, we did not use fluoroscopy as we had an adequate view through the low AM portal. Previous studies have used various portals to access the ossicle. For example, Lee et al. used AL, AM, and

superolateral portals for the procedure, allowing for immediate postoperative weight-bearing and full knee ROM (12). Lui recommended using one proximal and one distal portal to evenly suture the possible gap created in the patellar tendon due to injury following the ossicle removal (13).

Typically, the lateral portal is chosen as the working portal since it offers a more convenient approach to the ossicle (7). In our approach, we utilized low portals which provided even easier access to the ossicle as they are located closer to it when compared to the standard AL portals used in previous studies. However, these low portals offer limited working space, and therefore require a high level of surgical expertise. There have been reported cases of complications such as excessive infrapatellar fat pad debridement and anterior meniscal and intermeniscal ligament injury during arthroscopic removal (10, 14). To minimize the risk of patellar tendon damage during debridement, we opted to use high portals with more extensive working space to debride the infrapatellar fat pad. Another method that carries the advantage of less probability of damage to the meniscus and infrapatellar fat pad is the bursoscopic method introduced by Fujita et al. (14). This method involves removal through the infrapatellar bursa under ultrasound guidance. Furthermore, the use of ultrasound instead of fluoroscopy reduces the patient's exposure to unnecessary X-rays.

According to Pagenstert et al., restoring the anatomy of the tibial tuberosity is crucial for resolving symptoms. They achieved excellent results by using wedge osteotomy to reduce prominence after previous open and arthroscopic interventions failed due to incomplete ossicle removal (15). Although arthroscopic methods have several advantages, they offer less access and working space compared to open methods. This limited access may result in insufficient debridement of the tubercle, leading to incomplete symptom resolution and the necessity for further interventions (15).

Conclusion

Arthroscopic removal of the ossicle is preferred over open methods due to fewer postoperative complications. However, limited access during the removal and reestablishment of the tibial tuberosity's anatomy may result in insufficient results. The use of low portals offers better access for removal and eliminates the need for fluoroscopy to confirm complete removal. Nevertheless, the working space is confined, and a high level of surgical expertise is required. To minimize complications such as damage to the patellar tendon and meniscal ligaments and excessive fat pad debridement during infrapatellar fat pad shaving, the use of superior portals with more extensive working space is recommended.

Conflict of Interest

The authors declare no conflict of interest in this study.

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