

A Multimodal Approach on Osgood-Schlatter Disease - A Case Study

J. Dharani***¹, Anand Babu Kaliyaperumal², M. Malarvizhi³

¹MPT (Ortho.), PG Student, Sri Venkateshwaraa College of Physiotherapy, Puducherry, India

²MPT, (Ph. D), Associate Professor, Sri Venkateshwaraa College of Physiotherapy, Puducherry, India
Corresponding Author Email: [babumpt\[at\]gmail.com](mailto:babumpt[at]gmail.com)
Mobile: +919952724480

³ MPT (Ortho), Assistant Professor, Sri Venkateshwaraa College of Physiotherapy, Puducherry, India

Abstract: *Osgood-schlatter disease in adulthood is prone condition known as oteochondrosis. This condition tends to affect young sports person as well as normal individuals. In this case study 15 year old boy with Osgood-schlatter disease. Some clinical diagnostic examination was done. Strickland protocol was followed in a phase of rehabilitation. The outcome measure KOOS score was used. Prognosis was good after the session of five days programme, patient is able to do the activities of daily living and well improved in pain relief and muscle flexibility.*

Keywords: Osgood-schlatter disease, overuse injury, Strickland protocol, KOOS, quality of life

1. Introduction

Osgood-Schlatter disease (OSD) was first described by Robert Osgood and Carl Schlatter. Smillie describes Osgood-Schlatter disease as a traction epiphysitis. An apophysitis of the anterior aspect of the tibial tuberosity (ATT) is a painful overuse ailment of the tibial tuberosity. In the youthful population, it is a prevalent condition. In up to 30% of instances, the condition may be bilateral and is linked to growth spurts⁵. Boys are more likely to be affected than girls, according to traditional literature; the ailment often manifest in boys 1-2 years after it does in girls, who first show symptoms around the ages of 11.

In a sample of 959 teenage students, a Brazilian study revealed on OSD prevalence of 9.8% (11.0% in boys and 8.3% in girls) (de lucena et al., 2011)¹. 9.83% of kids aged 12 to 15 years old were affected by the condition⁸. Sports that emphasise repeated contractions of the knee extension apparatus include soccer, kickboxing, dance and skiing, as well as jumps (basketball, long jump), running (athletics), and other activities. Because of the stress, the tibial tubercle was partially irritated and avulsed, which is an overuse injury.

There is ongoing discussion over the pathophysiology of this growth-related disorder¹¹. The primary site of secondary ossification centre fragmentation and transient necrosis, according to the first theory, was the distal insertion of the patellar tendon when it was repeatedly pulled^{9,10}. The anterior tibial tubercle (ATT) normal development has been viewed as overruling the fragmentation of the ossification centre as a clear marker of OSD. Since the ATT is fragmented in both symptomatic and asymptomatic knees, it is impossible to distinguish between pathologies that are normal and those that are abnormal¹².

2. Case Study

A 15-year old boy came to our Physiotherapy department complaining of bilateral knee pain that had been present for five days and was getting worse as he engaged in activities. He played kabbadi, and no prior traumatic events were known about him. After a few days, he was still able to play even though the discomfort was less severe before five days. Even when he was just walking normally, the pain just got worse. When he arrived at the division with a hobbling walk.

Running and jumping activities worsen tibial tuberosity discomfort, which is moderate in severity and gets better when you bend your knee. Warmth could be felt when palpating the front of the knee, just below the patella. A grade 3 tenderness incident occurred. Review of literature, Physical Therapy and management (Mild-Voluntarily reports pain on palpation) over the tibial tuberosity to ANTICH BREWSTER et al., (2022). Around the tibial tuberosity and patellar tendon, there was a little, soft, varying swelling. Furthermore, the patient's knees were only fully extended to around 10 to 20 degrees while walking, and their full range of flexion was lessened.

After a clinical examination, a diagnosis is made. The most prominent aspect of the clinical examination is a painful, swollen tibial tubercle with surrounding soft tissue swelling, as well as painful, limited mobility⁷. Osteochondritis dissecans (OCD), Tibial tubercle avulsion fracture and Sinding-Larson-Johansson syndrome (SLJS), synovial plica injury, osteomyelitis of tibia should all be explored in the differential diagnosis before an OSD diagnosis can be made with certainty¹⁴. Except in cases when an inflammatory or other illness aetiology is suspected, laboratory tests are not necessary for the diagnosis of OSD. Tibial tuberosity is enlarged and fragmented in this image from a knee x-ray

examination. There are creation clinical diagnostic standards to identify this illness. A view of **PATHOPHYSIOLOGY AND REHABILITATION OF OSS**Valentin Uzunov et al., (2015)¹. Pain elicited with extension of the knee at 90⁰ of flexion, while a resisted straight-leg raise does not.² An alternative test is to force the tibia into internal rotation, while slowly extending the knee from 90⁰ of flexion; at about 30deg, flexion produces pain that subsides immediately with external rotation of the tibia.³ Pain can also be reproduced with passive hyperflexion of the knee⁴. A positive Ely test. 5. Point tenderness eliciting pain approximately 2 inches under knee cap over tibial tuberosity. ⁶. Full ROM is available at the knee, but tightness in hamstring muscle group is noticeable⁶.

Lateral and anteroposterior view knee radiograph indicated minor avulsion of tibial tuberosity, elevated tibial tubercle, Fragmentation of apophysis, Calcification of distal patellar tendon, and loss of sharp border of the patellar tendon (fig 1).



Figure 1

Reduced physical activity, analgesia and physical therapy make up the course of treatment for Osgood-schlatter disease¹. When the pain subsides, patients can be advised to gradually resume their normal activities. In the most cases, symptoms are self-limiting¹. The tibial growth plate should close after the patients is fully recovered, however some people who continue to experience symptoms into adulthood may need surgery.

Antich Brewster et al., (2022) Review of Literature and Physical Therapy and Management²⁰

Day 1

Modality: UST in 1: 4 ratio for 8 minutes
PRICE protocol followed
Myofascial trigger point release for Qceps

- Static stretching 10-20sec
- Q ceps, calf
- Hamstring stretching
- Target minimal stress to tibial tubercle.
- Cryotherapy advised



Figure 2

Day 2

Start a little exercise routine after the previous one.

Heel slide (stage 1 and 2)

Perform 2 sets of 15 rep. on each leg 1-3 times a day

SLR

2 sets of 15 rep. on each leg once a day

Wall squat

Perform 3 sets of 10-50 sec hold once a day

Step ups

Perform 2 sets of 15-20 rep. once a day



Figure 3

Day 3

Follow above the exercise

Pain get decreased

Bridge exercise

With exercise band around your knees

2 sets of 10 rep. once a day

Day 4

Prone hip extension

Once a day, 2 sets of 10 rep.

Wall squat with ex. band

Perform 2 sets of 10-20 rep. once a day

Day 5

Side Stepping with ex. ball

Perform 2-3 sets once a day

Walk sideways 20-30 ft

Progressive resisted exercise for knee flexor and extensor

Outcomes:

During first day of treatment KOOS score is: 59%

NPRS: 7 (moderate -severe)

After the session of five days programme, patient is able to do the activities of daily living.

KOOS (Knee injury and osteoarthritis outcome score) 13:
92% NPRS: 2 (mild)

3. Discussion

NSAID medication and physical therapy are part of the symptomatic treatment of Osgood-schlatter disease. The approach to treatment should include focus on getting the player back into the sports environment. It is also important to identify the method and precise cause of the ailment with the assistance of other rehabilitation team members. As a result of poor technique, ill-fitting protective gear, training mistakes, and muscle weakness and imbalance, children and adolescents may be particularly vulnerable to sports-related overuse injuries¹⁴

Other team members, such as trainer and coach, can assist in preventing a future recurrence of this injury. Athletes with OSD should shorten their workouts, do them less frequently, and at a lower intensity for only as long as they can bear the pain. Exercise intensity levels are adjusted in response to symptoms, and the process is repeated as necessary. Although the PRICE procedure benefits from the initial treatment. To prevent these disorders, it is crucial to teach young athletes about the key muscles for their particular sport, proper technique, and a balance posture from the start⁵.

Vaishya et al., who recommended the limitation of physical activities and exercises for the improvement of the quadriceps, hamstrings, and gastrocnemius muscles and describe beneficial effects of the use of ice packs, NSAIDs, and physiotherapy¹⁵.

A Review of the grey literature offers valuable information about possible treatment programs, which are frequently commercially advertised. A prominent example is the so-called Strickland protocol, which was presented at the European College of Sports Science Conference in Portugal in 2008 (**Strickland et al., 2008**). The protocol is mainly a combination of myofascial release massage (2 min daily) and active stretching of the quadriceps femoris muscle. Comparable therapeutic approaches may appear effective and successful.

Danneberg et al. reported successful treatment of OSD with autologous-conditioned plasma in two patients. The patients were pain-free after three and six weeks respectively, and able to return to sports. Both patients had treatment-resistant OSD. The sample comprising two patients is hardly sufficient to prove the clinical efficacy of platelet-rich plasma for OSD treatment. However, it might be an interesting hypothesis for future investigations¹⁹.

Herrero-Morin et al. described successful OSD treatment in a 12-year-old soccer player by activity avoidance and NSAID treatment. Warming up and stretching was recommended before and after the exercise respectively. The patient resumed regular training 4 months following treatment. Regularly appearing knee pain and swelling were treated by cooling¹⁶

Circi et al. noted the importance of conservative treatment in reducing the stress on the tibial tubercle and tension in the quadriceps muscle¹⁷.

However, **Baltaci et al.** and several other studies report immobilization of the affected extremity by casting or bracing if the knee pain causes impairment of daily activities¹⁸

In a recent study, the shortening of the rectus femoris muscle was also reported to be one of the main factors associated with the presence of OSD in adolescents

Levine and Kashyap advocates use of an infrapatellar strap during activities to decrease the pull of quadriceps against the tibial tubercle and report improvement in 92% of patients treated⁶.

Prognosis

Prognosis of OSD is excellent.

In about 10% of patients, the symptoms may continue into adulthood.

After the session of five days programme, patient is able to do the activities of daily living and well improved in pain relief and muscle flexibility.

References

- [1] **Cornelia Neuhaus(2021)**. A systematic review on conservative treatment options for OSGOODSchlatter Physical Therapy in Sport 49 (2021) 178e187
- [2] **E. N. Bezuglov(2020)**Conservative treatment of Osgood-Schlatter disease among young professional soccer players. International Orthopaedics <https://doi.org/10.1007/s00264-020-04572-3>
- [3] **Br J Gen Pract 2022**;Incidence and management of Osgood–Schlatter disease in general practice: retrospective cohort study **DOI: https://doi.org/10.3399/BJGP.2021.0386**
- [4] **Dr. Hiral Parmar 2022** Effect Of Fascial Distortion Model On Osgoodschlatter Disease-A Case StudyInternational Journal of Advanced Research and Publications ISSN: 2456-9992
- [5] **Hritvansingh Parmar (2014)**. OSGOOD SCHLATTER DISEASE: A RARE CONDITION IN YOUNG ATHLETES – A CASE STUDY. *International Journal of Physiotherapy*, 1(5), 265-268.
- [6] **Valentin Uzunov GYM COACH VOL.2(2008)**A LOOK AT THE PATHOPHYSIOLOGY AND REHABILITATION OF OSS Levine J.kashyap S 1981 : A new conservative treatment of Osgood schlatter`s disease. *Clinical orthopedic* 158:126-128
- [7] **Stanitski CL(1993)** Anterior Knee Pain Syndromes in adolescents. *The Journal of Bone and Joint Surgery*. 1993; 75(9):1407-1416

- [8] **Andrew J kientra et al., (2023)** Osgood schlatter disease management Journal of orthopedics and sports physical therapy JOSPT Vol.7
- [9] **Kujala UM, Kvist M, Heinonen O(1985).** Osgood-Schlatter's disease in adolescent athletes. Retrospective study of incidence and duration. American Journal of Sports Medicine. 13(4):236–41. [21]
- [10] **Katz JF(1981)** Nonarticular osteochondroses. Clinical Orthopedic Related Research. 158:70-6
- [11] **Sailly M, Whiteley R, Johnson A(2013).** Doppler ultrasound and tibial tuberosity maturation status predicts pain in adolescent male athletes with Osgood-Schlatter's disease: a case series with comparison group and clinical interpretation. British Journal of Sports Medicine. 47(2):93-97
- [12] **Ducher G, Cook J, Lammers G(2010).** The ultrasound appearance of the patellar tendon attachment to the tibia in young athletes is conditional on gender and pubertal stage. Journal of Science Medicine and Sport. 13(1):20–23
- [13] **Roos EM Roos HP, Lohmander LS, Ekdahl C beynnon BD(1998).** Knee injury and osteoarthritis outcome score(KOOS)—developmental of a self administered outcome measure. J orthop sports physical therapy aug:28(2): 88-96
- [14] **Halilbasic.H, Avdic.D, Kreso.A, Begovic.B, Jaganjac.A, Maric.M. (2012)**Importance of clinical examination in diagnostics of Osgood-Schlatter Disease in boys playing soccer or basketball. Journal of Health Sciences.; 2(1): 21-28.
- [15] **Raju vaishya Apophysitis of the tibial tuberosity(2016)** (os good schlatter disease): A review sep doi:10.7759/cureus.780 PMID: PMC5063719
- [16] **Herrero-Morín JD, Fernández González N, Gutiérrez Díez C, Pérez Menéndez MT, Fernández Fernández EM (2017)** Enfermedad de Osgood-Schlatter en un adolescente deportista. Caso Clín Arch Argent Pediatr 115(6):e445–e448
- [17] **Circi E, Beyzadeoglu T (2017)** Results of arthroscopic treatment in unresolved Osgood-Schlatter disease in athletes. Int Orthop 41(2): 351–356. <https://doi.org/10.1007/s00264-016-3374-1>
- [18] **Baltaci G, Ozer H, Tunay VB (2004)** Rehabilitation of avulsion fracture of the tibial tuberosity following Osgood-Schlatter disease. Knee Surg Sports Traumatol Arthrosc 12(2):115–118
- [19] **Danneberg DJ (2017)** Successful treatment of Osgood-Schlatter disease with autologous-conditioned plasma in two patients. Joints. 5(3):191–194
- [20] **Kaiyaperumal, A. B., Subbiah, B., & Manikavelu, P. (2023).** The Multimodal Exercises on Physical, Functional, Agility, and Perturbation for Post-ACL Reconstruction Among Athlete: Life Sciences-Sports Rehabilitation. International Journal of Life Science and Pharma Research, 13(2), L175-L185. <https://doi.org/10.22376/ijlpr.2023.13.2.L175-L185>
- T.J ANTICH BREWSTER MS, PT(1985) Osgood-schlatter disease: Review of literature and physical therapy