Journal of Imaging Science for Diagnosis
Vol. 2 No. 6 (2026): June 2026 issue
https://doi.org/10.51168/xr1bhb36
Case Report

A case study of bilateral tibial tubercle apophysitis

Ddumba Micheal
Medical Imaging Technologist from Ernest Cook Ultrasound Research and Education Institute, Radiology Department in Mengo Hospital, Kampala, Uganda.

Abstract

Background:

Tibial tubercle apophysitis, also known as Osgood-Shlatter disease, is a chronic fatigue injury due to repeated microtrauma at the patellar tendon insertion onto the tibial tuberosity. This condition was named after an American surgeon (Robert Osgood) and a Swiss professor of surgery (Carl Shlatter).

It occurs early in childhood as the growth plates of the bones have not fused. It rarely persists throughout adulthood and is, in most cases, a unilateral condition. In most children, the condition goes undiagnosed, as few parents and caretakers bother to take their young ones to health centers for diagnosis and treatment.

This condition is a common cause of anterior knee pain in the immature athletic population. The commonly associated sports include: basketball, volleyball, sprinting, gymnastics, and football. The condition is suspected in cases of insidious atraumatic pain.

Case presentation:

A 12-year-old male presented with bilateral leg pain and swelling localized around both knee joints. The symptoms were gradual in onset and were accompanied by a mild decrease in mobility. There was no history of trauma, fever, or systemic symptoms. The patient's medical history was unremarkable, with no previous orthopedic or systemic illnesses.

A bilateral leg x-ray revealed fragmentation of the tibial tubercles bilaterally. The overlying soft tissues were swollen and elevated.

Conclusion:

This case underscores the importance of considering bilateral tibial apophysitis in children presenting with knee pain and swelling, especially when symptoms are present in both limbs.

Keywords: *Tibial tubercle apophysitis, Osgood-Schlatter, x-ray.*
Submitted: October 01,2025 Accepted: November 30,2025 Published: June 26,2026
Corresponding author: *Ddumba Micheal.*
Email: micddumba@gmail.com
Medical Imaging Technologist from Ernest Cook Ultrasound Research and Education Institute, Radiology Department in Mengo Hospital, Kampala, Uganda.

INTRODUCTION

Tibial tubercle apophysitis, also known as Osgood-Schlatter disease, is a chronic fatigue injury due to repeated microtrauma at the patellar tendon insertion onto the tibial tuberosity. This usually affects boys between the ages of 10 and 15 years. In adolescents 10-15 years, the prevalence is 9.8% with 11.4% in males and 8.3 in females.

The disease is commonly seen in adolescents, in most cases, those who jump often and kick. The onset of this disease slightly comes earlier in girls than in boys, that is, 8-12 and 10-15 years for females and males, respectively. Shortening of the rectus femoris muscle is another secondary cause of this condition.

Clinically, these patients present with swelling and pain over the tibial tuberosity, worsened by strenuous exercise and vigorous activity. Tubercle apophysitis is diagnosed using X-ray, ultrasound, and MRI. Ultrasound, which is less costly than MRI, is often used instead to help provide soft tissue detail of the knee joints and help diagnose Tubercle apophysitis. MRI is still the most sensitive and specific modality in evaluating the condition, but it is less commonly used because of its scarcity and high cost. (Wakamuke et al., 2009). The treatment for this disease is most often done conservatively, i.e., rest, modulating strenuous activity, and quadriceps and hamstring strengthening exercises. padding the knee, application of ice, and giving analgesics. In some cases of severe damage, a therapeutic cast can be applied over the knee cap. Surgical excision of the bone fragments and free cartilaginous material can also be done.

Tubercle apophysitis has been noted to be commonly non-bilateral, but literature shows that globally about 4% of people get bilateral tubercle apophysitis at some point in time. Bilateral apophysitis on X-ray hasn't been documented in Uganda, and thus, this case report.

Journal of Imaging Science for Diagnosis
Vol. 2 No. 6 (2026): June 2026 issue
https://doi.org/10.51168/xr1bhb36
Case Report

Objective of the study

To highlight the importance of comprehensive imaging towards early intervention in pediatric patients presenting with bilateral tibial apophysitis.

CASE

Case presentation

Patient history: A 12-year-old male presents with bilateral leg pain and swelling around the knee joint, and presents at Ernest Cook Ultrasound Research and Education Institute Imaging department for limb x-ray. There was no history or differential diagnosis of this same condition, nor were there the medications that the patient was on before visiting Ernest Cook Ultrasound Research and Education Institute Imaging department for the limb X-ray.

Post-interventions: After the X-ray, the patient was taken back to the orthopedic doctor for post-interventions.

Ethical consideration.

This study implemented several measures to ensure the ethical integrity of this study. The patient's mother was provided with a clear and concise informed consent form outlining the study's purpose, risks, and benefits.

The patient's data was anonymized and stored securely in a password-protected database, with access restricted to authorized personnel. The study was committed to providing support resources and ensuring participants' right to withdraw.

Procedure:

The client was received in the radiology department, his request form was read well, and he was prepared for the examination.

Explaining the procedure to the patient and removing all radiopaque material from the knees. A non-grided examination of both legs was done with the patient seated and lying in the lateral decubitus position for the AP and lateral views, respectively.

Examination/Procedure: Bilateral leg x-ray projections were done with anteroposterior and lateral views acquired for each. A KVp of 55 and mAs of 2.5 were used using a Trimax digital detector and a Philips ceiling suspended x-ray machine.

X-ray findings;

In the acute phase, there is soft tissue swelling with loss of the sharp margins of the patellar tendon. Making a diagnosis at this stage requires a compatible and clear history. After 3 to 4 weeks, bone fragmentation is seen at the tibial tuberosity.

There was fragmentation of the tibial tubercles bilaterally. The overlying soft tissues were swollen and elevated. There is normal bone mineralization, and alignment at the knee and ankle joints is preserved. The joint spaces are preserved, and the growth plates are normal for age. The subchondral and periarticular surfaces are normal, and the surrounding soft tissues are normal.

Radiological Impression:

Findings are suspicious of tibial tubercle apophysitis, differential Osgood-Schlatter's disease.

The radiographs showing the above findings

Journal of Imaging Science for Diagnosis
Vol. 2 No. 6 (2026): June 2026 issue
https://doi.org/10.51168/xr1bhb36
Case Report

DISCUSSION

Tibia tubercle apophysitis is a self-limited condition that occurs secondary to repetitive extensor mechanism stress activities such as jumping and sprinting. The level of pain dictates the overall treatment. The force applied by the strong patellar tendon irritates or sometimes causes avulsion at the insertion, which is located at the soft apophysis of the tibial tubercle.

The tibial tubercle develops as the secondary center for ossification, which provides attachment for the patellar tendon. As bone growth exceeds the ability of the muscle-tendon unit to stretch adequately thus leads to an increase in tension across the apophysis, which is the weakest point in muscle-tendon-bone attachment. Therefore, there is a higher risk at this point for injury to occur due to repetitive stress. (Smith & Varacallo, n.d.)

This case is unique owing to the fact that both tibial apophyses were fragmented. The most common finding is unilateral involvement, as the contralateral limb is seldom used. The reason behind this is that most people have one dominant limb they use more than the other for carrying out routine activities like football, kicking, dancing, and high jumping. The bilateral nature of this case points to the fact that this patient was using both limbs equally (ambipedal) while playing football and thus predisposed both tibial apophyses to fragmentation.

Generalizability of the findings

Tibial tubercle apophysitis is a common overuse injury in adolescents, and the underlying pathophysiological mechanism is repetitive traction from the patellar tendon acting on a vulnerable apophysis during periods of rapid growth, which is applicable to the general adolescent athletic population. Therefore, the core biomechanical and developmental principles observed in this case are generalizable to individuals participating in jumping- and sprinting-based sports.

However, the bilateral fragmentation of the tibial tubercle represents an atypical presentation. Most reported cases are unilateral and associated with preferential loading of a dominant limb. The bilateral involvement in this patient likely reflects unique individual factors, such as ambipedal limb use, training intensity, frequency of play, or sport-specific biomechanics. As such, the bilateral nature of the findings cannot be readily extrapolated to the majority of patients with tibial tubercle apophysitis.

Conclusion

In summary, while the general mechanisms and clinical principles of tibial tubercle apophysitis are widely applicable, the specific finding of bilateral tibial apophyseal fragmentation is case-specific and has limited generalizability. Larger cohort studies would be required to determine the prevalence and risk factors associated with bilateral involvement.

Implication to practice

This finding of bilateral tibial apophysitis is an eye-opener to orthopedic officers and physicians that care must be taken when handling people with suspected tibial apophysitis, i.e., emphasis shouldn't be put on one symptomatic limb. The asymptomatic limb may be left unattended, yet it's also undergoing tubercle fragmentation. Also, when clerking patients its important to take note whether they are ambipedals or not. In the long run, this will help the orthopedic surgeons handle both limbs at a go rather than one, which would reduce the number of visits by the patient to the hospital.

Limitations:

The observations were derived from a single patient, which inherently limits external validity. Findings from an individual case cannot be reliably generalized to the broader population of adolescents with tibial tubercle apophysitis. The conclusion that ambipedal limb use contributed to bilateral involvement was inferential. Objective biomechanical analysis or activity-tracking data were not available to confirm symmetrical limb loading during football participation.

There was an absence of long-term follow-up, limiting understanding of symptom progression, healing patterns, and functional outcomes, which are important for assessing prognosis and treatment effectiveness.

Recommendations

Referring physicians need to assess both knees in patients with suspected tibial tubercle apophysitis. When ordering radiographs, clinicians should consider comparing bilateral images to delineate normal versus abnormal in the individual patient. Follow-up of these patients after some time should be done, as this condition can cross from childhood to adulthood in a case called unresolved Osgood-Schlatter disease.

Children who engage in vigorous activities and strenuous sports always need to be assessed and screened for any features of tibial tubercle apophysitis, as this can worsen in adulthood and result in Patella alta, patellofemoral maltracking, and transient patellar dislocation.

Provision of early Vitamin D supplementation can help reduce the effects and occurrence of this disease.

List of abbreviations

AP - Anteroposterior
KVp - Kilo Voltage Peak
mAs - milliAmpere seconds

Source of funding

The study didn't receive any funding.

Conflict of Interest

The author declares no conflict of interest.

Data availability.

Data in this study were readily obtained from the patient's clinical records (Picture archiving and communications system - PACS), including medical history and imaging reports. No publicly available datasets were used following the ethical guidelines.

Author's contributions

All authors contributed to the conception and design of the study. Data acquisition, clinical assessment, and interpretation were performed by the authors. All authors were involved in drafting the manuscript, critically revising it for important intellectual content, and approving the final version of the manuscript.

Author biography

The author is a medical imaging Technologist form Ernest Cook Ultrasound and Education Institute (ECUREI) – Mengo Hospital with academic experience in medical radiography and pattern recognition. The author is currently pursuing a Master's in Medical Imaging at Ernest Cook University and is actively involved in patient care, medical education, and scholarly writing, with a focus on improving diagnostic accuracy in plain radiography.

REFERENCES

1. *Osgood-Schlatter disease | Radiology Reference Article | Radiopaedia.org*. (n.d.). Retrieved June 1, 2023, from https://radiopaedia.org/articles/osgood-schlatter-disease
2. *Osgood–Schlatter disease—Wikipedia*. (n.d.). Retrieved June 1, 2023, from https://en.wikipedia.org/wiki/Osgood%E2%80%93Schlatter_disease
3. *Prevalence and Associated Factors of Osgood-Schlatter Syndrome in a Population-Based Sample of Brazilian Adolescents—Gildásio Lucas de Lucena, Cristiano dos Santos Gomes, Ricardo Oliveira Guerra, 2011*. (n.d.). Retrieved June 1, 2023, from https://journals.sagepub.com/doi/abs/10.1177/0363546510383835?journalCode=ajsb
4. Smith, J. M., & Varacallo, M. (n.d.). *Osgood Schlatter's Disease (Tibial Tubercle Apophysitis)*.
5. Wakamuke, E., Kawooya, M., Malwadde, E. K., & Muyinda, Z. (2009). Experience with ultrasound of the knee joint at Mulago Hospital, Uganda. *East and Central African Journal of Surgery*, *14*(2), 77–84. https://doi.org/10.4314/ecajs.v14i2

PUBLISHER DETAILS

SJC PUBLISHERS COMPANY LIMITED

SJC Publishers Company Limited
TODAY AND TOMORROW

Catergory: Non Government & Non profit Organisation
Contact: +256 775 434 261 (WhatsApp)
Email:info@sjpublisher.org or studentsjournal2020@gmail.com
Website: https://sjpublisher.org
Location: Scholar's Summit Nakigalala, P. O. Box 701432,Entebbe Uganda, East Africa