

Osgood-Schlatter Disease in Adult: Would Early Diagnosis and Treatment Improve the Prognosis?

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Received

28th January 2021

Received in revised form

17th April 2021

Accepted

30th April 2021

Published

1st March 2023

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ABSTRACT

Osgood-Schlatter Disease (OSD) is a juvenile osteochondritis of tibial tuberosity affecting athletic adolescents. However, the classical feature of persistent para-patellar pain is uncommon in skeletally mature adults. This case presents a 23-year-old gentleman with an 8-year history of bilateral anterior knee pain and swelling. The symptoms began after a sports injury which occurred when he was 15. The diagnosis of OSD was missed at this point as the presentation and radiological features mimic cracked fracture of the tibial tuberosity. Subsequently, he did not obtain medical care which resulted in worsening knee pain and swelling. Recent X-ray showed fragmented apophysis in both knees, supporting the diagnosis of bilateral OSD. Further evaluation suggests that he probably developed OSD long before he presented with the sport injury. This case highlights the importance of early diagnosis and management of OSD in childhood to improve the prognosis and reduce the risk of complications in adulthood.

KEYWORDS: Osgood-Schlatter Disease, adult male, primary care

INTRODUCTION

Osgood-Schlatter Disease (OSD) is a common cause of knee pain in active adolescents, usually affecting boys between the ages of 10-15 years [1]. It was named after two doctors, Robert Osgood (1873-1956), an American orthopaedic surgeon, and Carl Schlatter (1864-1934), a Swiss surgeon, when they concurrently described the condition in 1903 [1]. OSD is seen more frequently in boys than girls with a ratio of 3:1 [2]. The age of onset in boys is typically between 13 – 14 years, while the age of onset in girls is between 10 - 11 years [2].

OSD, also known as Tibial Tubercle Apophysitis is caused by inflammation of the proximal tibial tubercle at the insertion of patellar tendon. It is a chronic fatigue injury in which the inflammation is caused by repeated microtrauma i.e., repetitive quadriceps contraction at the patellar ligament insertion onto the skeletally immature tibial tubercle produced

during sporting activities [1]. Therefore, it is commonly associated with adolescents engaging in high level of activity such as jumping, squatting and running as these activities place stress on the tibial tubercle through repetitive contraction of quadriceps muscle [3]. Kujala *et al.* showed that OSD occurred in approximately 21% of athletic adolescents compared to 4.5% in age-matched non-athletic controls. It is usually an asymmetrical condition but it can also be bilateral in 25% to 50% of the cases [4].

History and physical examinations are sufficient to make a clinical diagnosis of OSD. Patients with OSD typically present with history of acute painful lump just below the knee joint that is aggravated by physical activity and relieved with rest. The pain and swelling may gradually worsen over time, aggravated by repetitive physical activities [2]. Excess bone growth which occurs in the tuberosity produces a visible lump that can be very painful when hit. Later, activity such as



kneeling can further irritate the tendon and provoke more pain. Therefore, localised bony swelling and tenderness at the tibial tuberosity on physical examinations are suggestive of the diagnosis. Plain radiographs are typically performed to exclude other causes of anterior knee pain such as fractures, cancers, or inflammatory disorders. However, radiological findings of fragmentation and irregularity of apophysis at the tibial tuberosity can be an integral part of the diagnosis of OSD, though it is non-specific [5].

OSD is a benign and self-limiting condition but does not resolve until growth has halted [2]. Thus, the symptoms normally resolved upon closure of the physis. However, in about 10% of patients, the symptoms remain into adulthood despite conservative treatments [5]. In this case report, we present a case of a 23-year-old gentleman with an 8-year history of bilateral anterior knee pain and swelling; and discuss the importance of early diagnosis and conservative management of OSD in childhood as it would have improved the prognosis and reduced the risk of complications in adulthood.

CASE PRESENTATION

A 23-year-old gentleman, who works as an enforcement officer, presented to our university primary care clinic on the 6th of July 2020 with an 8-year history of bilateral anterior knee pain and swelling. The symptoms began after a sports injury when he was 15 years old. He planted his fully extended left knee in a twisting position while playing futsal and heard a 'pop' sound. He developed pain and swelling in the left knee immediately after the incident. Subsequently, he went to a private primary care clinic where the x-ray showed that he had suffered a hairline fracture of the left tibial tubercle. He was given analgesia and was referred to emergency department for further evaluation and management of the small, cracked fracture of the tibial tuberosity. Following discharge from the private clinic, he did not go to the emergency department and subsequently defaulted in his follow-up treatment as the pain subsided.

Over the years, he did not obtain any medical care for his knee including physiotherapy. As a result, the left knee pain began to worsen intermittently. He has been having acute knee pain when performing certain activities such as kneeling during prayer and squatting while at work. The pain score was 8/10 and he had to pray on the chair as the pain was intolerable. At the same time, he also developed right knee pain and noticed enlargement of bony prominence just below the right and left kneecaps. The bony swellings would produce pain when they are in contact with hard surfaces such as kneeling or accidentally getting hit. The symptoms recurred when he played sports and resolved with rest. He did not require analgesia as the pain resolved spontaneously after contact avoidance. He denied having fever, swelling elsewhere, recent trauma, fracture or fall, or family history of bone tumour.

On examination of the knees, there were swellings on the anterior aspect of the proximal part of both tibia which were tender and bony hard on palpation (Figure 1). The swellings were non-mobile and had rough surfaces. Pain was reproducible on flexion of the knee joint and upon squatting. The range of movements of both knee joints was full. There was no muscle atrophy, local warmth or effusion. The overlying skin was normal. Physical examinations did not demonstrate coexisting injuries e.g. bursitis or tendonitis. The consistency and location of the swelling suggested that there was no inflammation of the infrapatella bursa. It is very important to detect the involvement of infrapatellar bursitis that can be part of OSD, as this may hinder the management plan. The lateral view of plain films showed fragmented apophysis of the right tibial tubercle and incomplete closure of the left tibial tubercle (Figure 2). These findings are consistent with OSD. The patient was then referred to the Orthopaedic clinic for further assessment and appropriate management. He was counselled on the potential surgical operation of bone resection and screw fixation of the right tibial tuberosity, and conservative care for the left tibial tuberosity. The potential complications of surgery had also been addressed as there are risks of failure of fixation and non-union of the affected bone. Subsequently, the patient decided not to opt for surgery and opted for conservative management with physiotherapy.



Figure 1 Tender bony prominence over the tibial tuberosity of the right and left knees

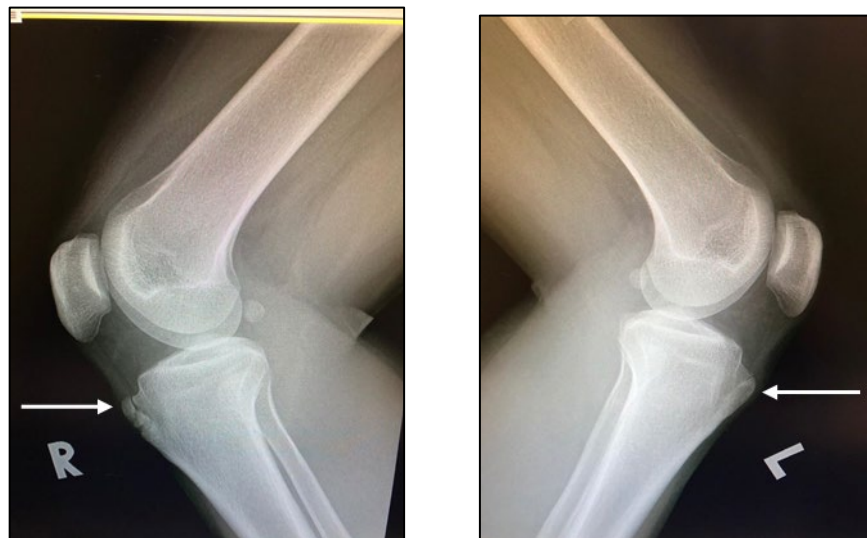


Figure 2 Plain radiographs of bilateral knee joints (lateral view) demonstrating fragmented apophysis of the right tibial tubercle and incomplete closure of the left tibial tubercle

DISCUSSION

OSD is a benign, self-limiting condition which typically affects adolescents with resolution of symptoms within 12 to 24 months after its onset in more than 90% of cases [5]. However, in this case report, we describe an uncommon presentation where a 24-year-old patient presents with an 8-year history of persistent bilateral knee pain and swelling. The symptoms began after a sports injury which occurred when he was 15 years old where he planted his fully extended left knee in a twisting position while playing futsal. The diagnosis of

OSD was missed at this point as the presentation and radiological findings mimic small, cracked fracture of the tibial tuberosity. This simple hairline non-displaced fracture could be part of OSD presentation. During the growing up years, the forceful contraction across the apophysis may lead to multiple subacute avulsion fractures along with inflammation of the tendon at the apophysis [6]. However, the avulsion fracture of the tibial tuberosity is uncommon, denotes less than 3% of the epiphysiolysis and may occur from injury with the knee in full extension [7], as in the case of our patient. The patient was informed that he had a small fracture

and was treated conservatively. He subsequently defaulted treatment which may have led him to develop worsening pain and swelling into adulthood. Recent X-ray of his knee joints showed fragmented apophysis of the right tibial tubercle and incomplete closure of the left tibial tubercle, supporting the diagnosis of OSD [5]. Further evaluation suggests that he probably developed bilateral OSD long before he presented with a sport injury of the left knee at the age of 15 years. A study shows that young adults with a history of OSD have more problems with activities of daily living and sporting activity almost 8 years after the initial diagnosis of OSD compared with those without a history of OSD [3]. Rarely, MRI is used to assist in diagnosis of atypical presentation. It is also used to stage the severity of OSD which may be helpful in determining the prognosis particularly in young adults with intractable symptoms despite conservative measures [8].

The mainstay treatment for OSD is conservative management which includes ice compression, limitation of activity, physiotherapy and analgesia to relieve the pain. Surgical intervention is uncommon before the patients complete their growth spurts. Once the diagnosis is made, patients will normally be followed up until the pain resolves, of which may take up to 24 months after the onset of symptoms. The resolution of symptoms commonly occurs following complete closure of the epiphyseal plate. On average, this happens at the age of 15 years in girls and at the age of 17 years in boys. Kujala *et al.* found that more than 90% of cases resolved with conservative management [4]. However, even with conservative management, approximately 10% of patients would have persistent symptoms which remain into adulthood [5]. Without conservative treatment, the proportion with persistent symptoms is expected to be higher [9], as in the case of our patient. Therefore, early diagnosis and conservative management of OSD in childhood should be emphasized as it would have improved the prognosis and reduced the risk of complications in adulthood [9, 10]. A high index of suspicion is needed to diagnose OSD in active adolescent boys presenting with anterior knee pain in primary care. Other differential diagnoses may include patellofemoral pain syndrome, Plica Syndrome, impingement of infrapatellar fat pad and stress fracture

of the proximal tibia which are also associated with young athletes [6, 11]. Primary care physicians need to have the knowledge and understanding on various causes of anterior knee pain including OSD as this will aid in early diagnosis, conservative management and appropriate referrals. Once the diagnosis of OSD is made, it is important to explain the treatment options and prognosis to the patient, especially if it is left untreated.

Orthopaedic referral is necessary if the symptoms persist despite skeletal maturation as anatomical reduction may be warranted, as in the case of our patient. Pihlajamäki *et al.* found that in most young adults, good to excellent functional results can be obtained with surgical intervention of unresolved OSD. The study also noted that by the end of a (median) 10-year follow-up period of 107 patients, 93 (87%) reported that they could resume their regular daily and work activities without limitations, and 80 patients (75%) had restored their preoperative sports activity level. Additionally, 41 patients (38%) stated they have no more pain with kneeling [12]. In a retrospective study of 15 patients who underwent excision of ossicles and tibial tubercleplasty, Weiss *et al.* showed that 75% of them had a good recovery and were able to restart preoperative activities. Hence, this study recommended that surgical intervention particularly removal of ossicles should be offered after skeletal maturity [13].

Despite successful results with surgical intervention in patients with OSD who have failed conservative measures, problems can emerge with respect to the procedure. For example, in the case of bone resection and patella tendon bone screw fixation, there may be a risk of breakage of bony fixation which can cause failure of fixation and impede the extensor mechanism. The failure of respected bone to unite may also occur though it is infrequent in skeletally mature adult [11]. Otherwise, Pihlajamäki *et al.* reported that subsequent postoperative complication and reoperation are rare [12]. El-Husseini *et al.* also showed 91% of patients with unresolved OSD had complete resolution of preoperative knee pain after ossicle and bursa excision [14]. However, after weighing the benefits and risks, our patient decided not to opt for surgery and opted for conservative management with physiotherapy.

CONCLUSION

In summary, this is a case of undiagnosed childhood OSD, resulting in persistent symptoms in adulthood. Early diagnosis and conservative management of OSD in childhood should be emphasized as it would have improved the prognosis and reduced the risk of complications in adulthood. Primary care physicians need to have the knowledge and understanding on various causes of anterior knee pain including OSD as this will aid in early diagnosis, conservative management, and appropriate referrals. A high index of suspicion is needed to diagnose OSD especially in adolescent boys who are actively involved in sports and present with anterior knee pain in primary care. Once the diagnosis of OSD is made, it is important to explain the treatment options and prognosis to the patient, especially if it is left untreated. Patients have the right to make an informed decision regarding the treatment options after weighing up their risks and benefits.

Key Learning Points

- Early diagnosis and conservative management of OSD in childhood is pivotal as it would have improved the prognosis and reduced the risk of complications in adulthood.
- A high index of suspicion is needed to diagnose OSD especially in active adolescent boys presenting with anterior knee pain in primary care.
- Patients have the right to be informed of the diagnosis so that they can make an informed decision regarding the treatment options after weighing up their risks and benefits.

Conflict of Interest

Authors declare none.

Acknowledgements

We would like to thank the patient who provided clinical information for this case and permission to publish this case report.

Authors' contribution

NHS and ASR drafted the manuscript. SFBS and MFMM revised it critically for important intellectual content. All authors have read and approved the final version of this manuscript.

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