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Osgood Schlatter's Disease in Teaching Hospital Setting: A Case Series

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Original Research Article

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ABSTRACT

Background: Osgood Schlatter disease (Tibial Apophysitis) is a disease of the musculoskeletal system often observed during the bone growth phase in adolescents. It is an inflammation of the tibial tuberosity just below the knee where the patellar tendon attaches to the tibia.
Aim: The aim of this study was to assess the major presenting complains, affected knee and treatment offered to these patients.
Methods: This is retrospective study as data was extracted between December 2020 and January 2022 from the medical records and patients' case folders on bio-data, presenting complains, examinations carried out and diagnosis made. Presenting complains, affected knee, and treatment offered were the key variables observed. Only files of patients with complete medical records were included in this study. Descriptive statistical analysis was followed to determine frequencies and percentages.
Results: A total of 8 cases of OSD were extracted. Two cases (25%) were 14 years. We also had cases of 18 and 19 years of age included. About 62.5% of the children were females while 37.5% were males. Majority of these children presented with anterior knee pain (87.5%) while only one child presented with swelling at the knee (12.5%). 75% had OSD on left knee while only 12.5% had it on right and both knees. Most common treatment offered to this patients was lifestyle modifications and oral analgesics.
Conclusions: OSD is a very rare condition and should be considered by physicians in any adolescent with chronic knee pain.

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Keywords: Adolescent; knee pain; Osgood Schlatter's disease; tibia apophysitis.

1. INTRODUCTION

In the active teenager, Osgood Schlatter's disease (OSD) is a prevalent cause of anterior knee discomfort. It's also known as tibial tubercule osteochondrosis or traction apophysitis [1]. It's particularly frequent among teenagers who participate in sports. Osgood and Schlatter both characterized a painful tibial tuberosity ailment in 1903. They proposed that OSD was caused by a partial traumatic avulsion of the tibial tuberosity near the patellar tendon's insertion. Many explanations about the origin of OSD have since been proposed, including patellar tendon degeneration, aseptic necrosis, and infection [2,3]. OSD was first described by Ogden as an avulsion of a part of the growing ossification center; this avulsion can also occur when cartilage cells are hypertrophic in the preossification phase [4,5]. The force from the anterior patellar tendon at its location of insertion is the major cause of this disease [6,7]. Adults' injuries are typically caused by direct contact on the tubercle, rather than contraction of the quadriceps, as seen in teenagers [8].

There is a partial loss of continuity of the patellar tendon-cartilage-bone junction of the tibial tuberosity in the pathophysiology of this disorder. Patellar tendinitis, repeated subacute fractures, and uneven ossification with underlying bone are all symptoms of an inflammatory process that begins in the area and terminates there [9]. Microavulsions grow with time in people who have damaged the tibial tubercle and continue to participate in sports. A detached portion of the patellar tendon may result, resulting in persistent, nonunion discomfort [10]. However, certain radiological investigations revealed that individuals with OSD had anatomical changes at the location where the patellar tendon is inserted. OSD is more frequent in females between the ages of 8 and 13, and in boys between the ages of 12 and 15 [10].

OSD is seen in 21 percent of sporty adolescents and 4.5 percent of age-matched nonathletic controls [11,12]. In 20–30% of cases, the condition is bilateral [8]. Aching and discomfort to swelling, acute pain, and limping are some of the clinical signs. The start is slow, with mild intermittent pain, but the discomfort can become intense and constant during the acute phase [13,14]. Running and leaping cause discomfort because the knee is loaded in flexion, resulting in an eccentric quadriceps contraction [10]. Pain, tenderness, and local swelling around the patellar tendon and tibial tuberosity are common findings on examination [15]. Patients may have an antalgic gait when walking. There are no signs of effusion or instability, and the knee's passive range of motion is complete. Quadriceps and hamstring muscular stiffness are quite prevalent [10,16]. Singdin Larson Johansonn syndrome, Osteochondritis dissecans (OCD), Tibial tubercle avulsion, and fractures are all different diagnoses [17]. Laboratory tests are not necessary to diagnose OSD unless an inflammatory or other disease cause is suspected [18]. The tibial tubercle is larger and fractured on a knee x-ray [18].

Clinical assessment of OSD is regarded sufficient in most medical settings, and routine ultrasonography testing is not suggested. Many writers, however, agree that ultrasonography examination should be the primary choice. Ultrasound examinations are recognized to be as quick, straightforward, cost-effective, and dependable as x-rays. Only in a few rare or unclear situations should CT and MRI examinations be undertaken [19]. Reduced physical activity, analgesia, and physical therapy are all used to treat Osgood-Schlatter disease. In rare circumstances, a cylinder cast is utilized to compel youngsters to rest when they refuse to cooperate with therapy [13]. Symptoms are usually self-limiting, and patients can be told to gradually resume normal activities as the discomfort subsides [13]. Accordingly, the aim of this study was to describe the epidemiologic profile of OSD cases during a 2 year period at Babcock University Teaching Hospital, Ilishan Remo, Ogun State. We also aim to determine the presenting complains, affected knee and treatment offered to these patients.

2. METHODS

A retrospective cross-sectional review of pediatric patients presenting with pain, swelling and tenderness of the tibial tuberosity in our center between December 2020 and January 2022. This study was conducted at the orthopedic unit of Babcock University Teaching Hospital, Ilishan-Remo, South-western Nigeria. Data were extracted from the medical records and patients' case folders on bio-data, presenting complains, examinations carried out and diagnosis made. Only files of patients with

complete medical records were included in this study. All information obtained was treated with strict confidentiality. OSD isn't a common condition. Eight children case files were retrieved in this study. Major complaints as documented in the case files were pain, swelling and tenderness of the tibial tuberosity after which a diagnosis of OSD was made. We also included patients who were 18 and 19 years old. A history of OSD, age at onset of knee pain were examined.

2.1 Statistical Analysis

Data collected were analyzed using the Statistical Package for the Social Sciences for Windows version 26 (SPSS Inc., Chicago, IL, USA). Results were presented with descriptive statistics

3. RESULTS

This study had 8 cases of OSD from November 2017 to November 2021. Two cases (25%) were 14 years. We also included cases of 18 and 19 years of age as their x-rays showed features of OSD. About 62.5% of the children were females while 37.5% were males (Fig. 1). Majority of these children presented with knee pain (87.5%) while only one child presented with swelling at the knee (12.5%) (Fig. 2). 75% had OSD on left knee while only 12.5% had it on right and both knees. Most common treatment offered to this patients was lifestyle modifications and oral analgesics. Reduced physical activity and limiting movements that aggravate pain, limiting activity based on symptoms, using ice for 20 minutes every 2-4 hours and after activity, wearing a knee pad during activity, and cross-training with low impact sports such as cycling or swimming were among the lifestyle modifications prescribed to the patients.

4. DISCUSSION

This retrospective case study series is focused on OSD during a period of 2 years at Babcock University Teaching Hospital, Ilishan Remo, Ogun State, Nigeria. We extracted 8 Pediatric cases of OSD from the records and patients' case folders. Only files of patients with complete medical records were included in this study. Osgood-Schlatter syndrome affects the periosteum and the epiphyseal zone of bone in the tibial apophysis and occurs in individuals during the growth phase, especially in adolescent boys [10,20].

A radiographic examination usually confirms the diagnosis and excludes out other potential causes of anterior knee discomfort, such as quadriceps tendon avulsion, patellofemoral stress syndrome, pes anserinus bursitis, chondromalacia patellae, and proximal tibia osteomyelitis.

X-rays demonstrate irregularity of the tibial apophysis and detachment from the tibial tubercle in the early stages. Depicted in Fig. 3 and 4 are lateral knee radiographs of the OSD showing fragmented tibial and edematous infrapatella fat pad.

The ages of occurrence for both sexes are typically between 14-15 years (14.0±3.55). The most common affected knee was the left (75%) while the disease occurs more in female subjects (62.5%). One would wonder if the left sided preponderance could be related to hand dominance Smillie [21] however stated that right-handed youths have right-sided complaints, the literature indicates that left-sided involvement is more common [22,23,24,25]. As most individuals are right-hand dominant, the question that arises is whether left knees may be at a greater risk secondary to sporting activities which they usually perform "right-handed." The left lower extremity moves functionally with the right upper extremity when one examines an individual's gait pattern [25]. This is very similar to the neurological principles concerning "reciprocal innervation." For example, A basketball player making a right-handed layup leaves the floor with this left leg, which he terms his "jumping leg." A right-footed soccer player runs up to the ball, plants his left leg, and kicks with the right. The left knee would be subjected to the great deceleration and rotational forces which would require a more explosive quadriceps contraction [25].This is in contrast with most literature studies as most have male preponderance of the condition [26,27,28].

Most literature studies revealed that pain at the knee is the most common complain of the patient [29,30,31]. In collaboration with this, our finding also found out that knee pain (87.5%) was a major complain. About 62.5% of the patients were offered lifestyle modifications and oral analgesics as treatment. Conservative measures result in an excellent outcome in 90% of cases in a study by Ghlove et al. [10]. Circi et al. [32] also reported that applications of rest and analgesic were major treatment offered in their study.

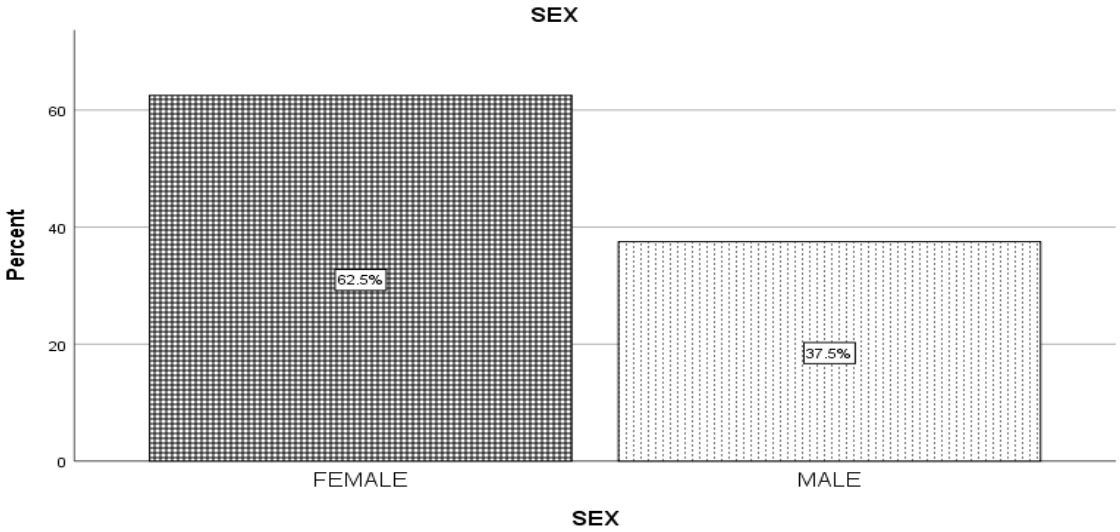

Fig. 1. Gender distribution

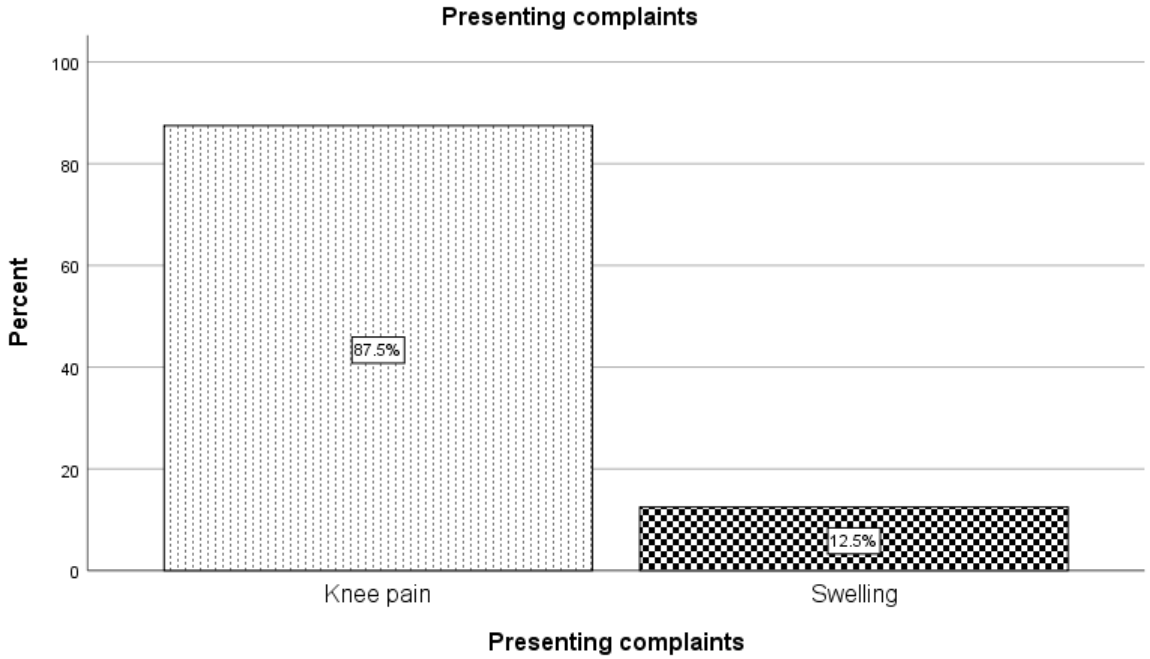

Fig. 2. Bar chart showing presenting complaints

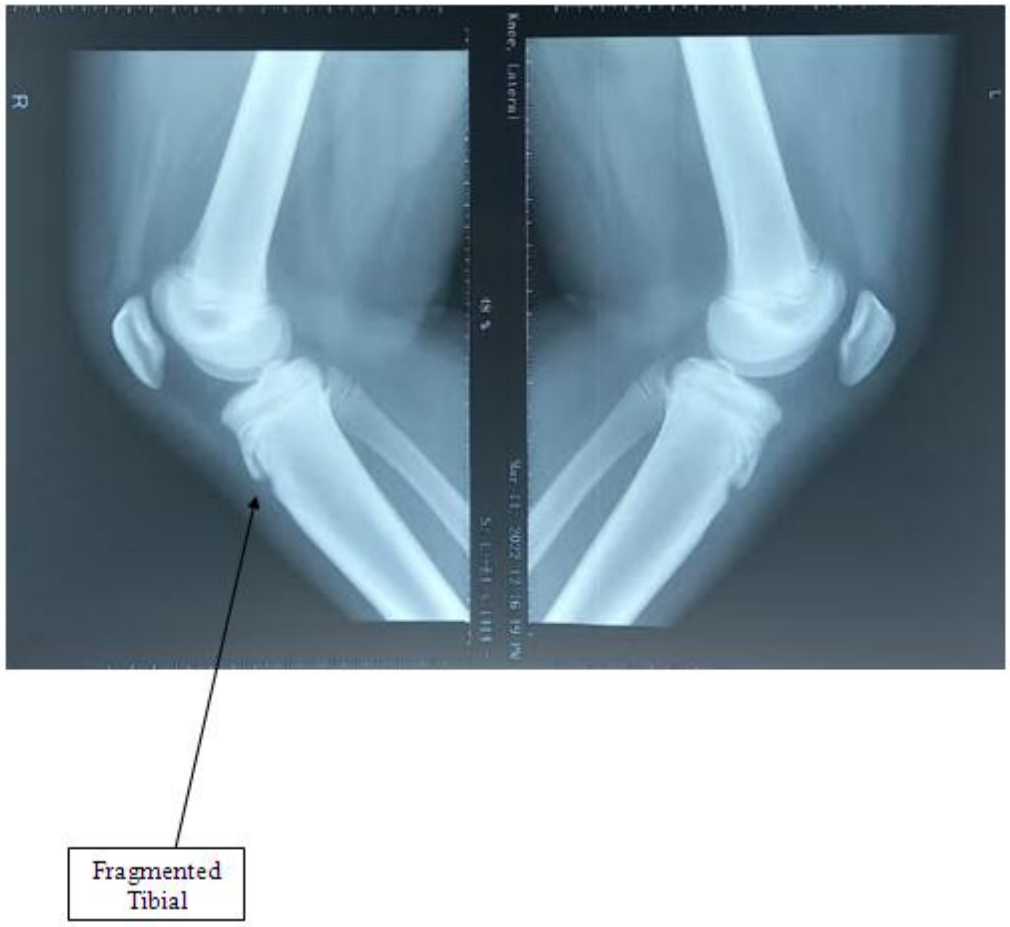

Fig. 3. Lateral knee radiograph of Osgood-Schlatter disease showing fragmented tibial

Fig. 4. Lateral knee radiograph of Osgood-Schlatter disease Edematous infrapatella fat pad

5. CONCLUSION

OSD is an uncommon condition and should be considered by physicians in an adolescent with chronic knee pain. History of the patient, presenting complains and clinical examinations are the important tools for diagnosing this disease. Ethical approval for this study was obtained from the Babcock University Research committee (BUREC).

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

Study was approved by the institutional ethics committee (Babcock University Research Committee).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Smith JM, Varacallo M. Osgood Schlatter's Disease (Tibial Tuberceule Apophtsitis). NCBI Bookshelf. A service of the National Library of Medicine, National Institutes of Health. StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2019.
2. Cole JP. A study of Osgood–Schlatter disease. Surg Gynecol Obstet. 1937;65: 55–67.
3. Pease CN. Relationship of Streptococcus viridans to apophysitis of tibial tubercle. Am J Surg. 1934;24:149–150.
4. Ogden JA. Radiology of postnatal skeletal development. X. Patella and Tibial tuberosity. Skeletal Radiol. 1984;11(4): 246–257.
5. Ogden JA, Southwick WO. Osgood–Schlatter's disease and tibial tuberosity development. Clin Orthop Relat Res. 1976;116:180–189
6. Demirag B, Ozturk C, Yazici Z, Sarisozen B. The pathophysiology of Osgood–Schlatter disease: a magnetic resonance investigation. J Pediatr Orthop B. 2004;13(6):379–382
7. Hirano A, Fukubayashi T, Ishii T, Ochiai N. Magnetic resonance imaging of Osgood–Schlatter disease: the course of the disease. Skeletal Radiol. 2002;31(6):334–342
8. de Lucena GL, dos Santos Gomes C, Guerra RO. Prevalence and associated factors of Osgood–Schlatter syndrome in a population-based sample of Brazilian adolescents. Am J Sports. 2011;38(2): 323–45
9. Circi E, Atalay Y, Beyzadeoglu T. Treatment of Osgood–Schlatter disease: review of the literature. Musculoskelet Surg. 2017;101(3):195–200
10. Gholve PA, Scher DM, Khakharia S, Widmann RF, Green DW (2007) Osgood Schlatter syndrome. Curr Opin Pediatr. 2007;19(1):44–50
11. Dunn JF. Osgood–Schlatter disease. Am Fam Physician. 1990;41(1):173–176
12. Kujala UM, Kvist M, Heinonen O. Osgood–Schlatter's disease in adolescent athletes. Retrospective study of incidence and duration. Am J Sports Med. 1985;13(4): 236–241
13. Maher PJ, Ilgen JS. Osgood Schlatter Disease. BMJ Case Report. Med. 2013;39(2):415–420
14. Sailly M, Whiteley R, Johnson A. 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. 2013;47(2):93-97.
15. Patel DR, Villalobos A. Evaluation and management of knee pain in young athletes: overuse injuries of the knee. Transl Pediatr. 2017;6(3):190-198.
16. Cakmak S, Tekin L, Akarsu S. Long-term outcome of Osgood–Schlatter disease: not always favorable. Rheumatol Int. 2014; 34(1):135–136.
17. Lau LL, Mahadev A, Hui JH. Common Lower Limb Sports-related Overuse

Injuries in Young Athletes. Annals Academy of Medicine. 2008;37(4):315-319.

18. Bloom OJ, Mackler L, Barbee J. Clinical inquiries. What is the best treatment for Osgood-Schlatter disease? Journal of Family Practice. 2004;53(2):153-156.
19. Halilbasic H, Avdic D, Kreso A, Begovic B, Jaganjac A, Maric M. Importance of clinical examination in diagnostics of Osgood-Schlatter Disease in boys playing soccer or basketball. Journal of Health Sciences. 2012;2(1):21-28
20. Yashar A, Loder RT, Hensinger RN. Determination of skeletal age in children with Osgood-Schlatter disease by using radiographs of the knee. J Pediatr Orthop. 1995;15:298-301.
21. Smillie IS: Injuries to the Knee Joint, Ed 5. Edinburgh: Churchill Livingstone; 1978.
22. King AG. Blundell-Jones G: A surgical procedure for the Osgocd- Schlatter lesion. Am J Sports Med. 1981;9:250-253.
23. La Zerte GD. Rapp IH: Pathogenesis of Osgood-Schlatter's disease. Am J Pathol. 2001;34:803-811.
24. Levine J, Kashyap S. A new conservative treatment of Osgocd- Schlatter's disease. Clin Orthop. 2000;158:126-128, 198.
25. Antich TJ,Stephen J, Lombardo MD. Clinical presentation of osgood- schlatter disease in the adolescent population. Jospt. Art Rev. 2007;18(1):95–120.
26. Indiran V, Jagannathan D. Osgood-Schlatter disease. N Engl J Med. 2018;378(11):e15.
27. Emorinken A, Agbebaku FO, Agbadaola OA, Ugheoke AJ (2020). Bilateral Osgood-Schlatter Disease in an Adolescent Nigerian Male: A Case Report Asian Journal of Case Reports in Medicine and Health. 2020;4(1):6-9.
Article no.AJCRMH.61172
28. Pommering TL, Kluchurosky L. Overuse injuries in adolescents. Adolesc Med State. 2008; 372(12).
29. Ducher G, Cook J, Lammers G. 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. 2010;13(1):20–23.
30. Hanada M, Koyama H, takahashi M, Matsuyama Y. Relationship between the clinical findings and radiographic severity in Osgood–Schlatter disease. Journal of Sports Medicine. 2012;3:17-20.
31. Kaya DO, Toprak U, Baltaci G, Yosmaoglu B, Ozer H. Long-term functional and sonographic outcomes in Osgood Schlatter Disease. Knee Surgery Sports Traumatology and Arthroscopy. 2013; 21(5):1131-9.
32. Circi E, Atalay Y, Beyzadeoglu U. Treatment of Osgood–Schlatter disease: review of the literature. Musculoskelet Surg; 2017.
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