

Isolated lesser trochanter avulsion fracture in an adolescent footballer: successful conservative management

Buğra Can^{1*} and Şükrü Demir¹

¹Department of Orthopedics and Traumatology, Faculty of Medicine, Firat University, 23119, Elazığ, Turkey

*Corresponding author: Buğra Can, MD, Department of Orthopedics and Traumatology, Faculty of Medicine, Firat University, 23119, Elazığ, Turkey; drbugracan23@gmail.com

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Abstract

A lesser trochanter avulsion fracture is an injury that typically occurs in young athletes due to sudden muscle contractions and high-load mechanical stress. These fractures result from the abrupt contraction of the iliopsoas muscle and share similar characteristics with apophyseal injuries. Although rare, they hold clinical significance due to uncertainties in the treatment process and the presence of various treatment options. This case report discusses the conservative treatment process of an adolescent football player who sustained a lesser trochanter avulsion fracture while playing football. The patient presented with complaints of acute hip and groin pain. Diagnostic evaluations confirmed the presence of an avulsion fracture. During the conservative treatment process, the patient was regularly monitored for four months, and by the 18th week, a complete clinical resolution was achieved. These treatment results support the effectiveness of conservative treatment methods for isolated lesser trochanter fractures. However, in some cases, surgical intervention may be necessary, and it is important to personalize the treatment process for each patient. This case report demonstrates that a conservative approach to the treatment of lesser trochanter avulsion fractures can yield successful results, while also emphasizing that each patient's condition is unique, and the treatment plan should be tailored accordingly.

Keywords: Lesser trochanter, avulsion fracture, iliopsoas muscle, conservative treatment, adolescent athlete, football player

Introduction

Lesser trochanter avulsion fracture is an uncommon apophyseal injury that usually occurs due to a sudden and forceful contraction of the iliopsoas muscle during high-intensity physical activity. These injuries are most prevalent among adolescent athletes, particularly football players and gymnasts, and may result in prolonged pain or functional limitations [1]. The specific pelvic anatomy predisposes secondary ossification centers to traction injuries [2].

Although lesser trochanter avulsion fractures account for less than 1% of all hip injuries, they carry notable diagnostic and therapeutic importance. These fractures typically occur following a sudden traction force generated by the iliopsoas muscle and share similar pathophysiological features with apophyseal injuries [3]. In the literature, conservative treatment has generally been reported to provide satisfactory functional outcomes; however,

the indications for surgical intervention and the standardization of rehabilitation protocols remain subjects of debate [2, 4].

This case report presents the conservative management and clinical outcome of an adolescent football player who sustained a lesser trochanter avulsion fracture during play.

Case report

A 14-year-old male football player presented to the Emergency Department of Firat University with acute right hip and groin pain and inability to bear weight following a high-velocity kick. His medical history was unremarkable. On admission, he walked with an antalgic gait. Pain was elicited during hip motion, particularly with flexion and extension. With both hips flexed to 90°, further flexion of the right hip produced marked pain, and the Ludloff test was positive.



Figure 1. Anteroposterior pelvis/right hip radiograph obtained at initial presentation showing an isolated avulsion fracture of the right lesser trochanter with a small displaced bony fragment

Routine hematologic and biochemical investigations were within normal limits, and screening for metabolic disorders was negative. An anteroposterior pelvic radiograph demonstrated an avulsion fracture of the right lesser trochanter with approximately 1 cm of displacement (Figure 1). No other abnormalities were detected that could account for the patient's symptoms. Conservative management was initiated. The patient was instructed to avoid weight-bearing with the aid of crutches. After two days of observation, he was discharged and scheduled for outpatient follow-up at 4, 8, 12, and 18 weeks. Partial weight-bearing was permitted at week 4 and full weight-bearing at week 6 as pain subsided. Gentle range-of-motion and progressive hip-strengthening exercises were introduced as tolerance improved. By week 12, the patient had regained full, pain-free motion of the hip. At the 18-week evaluation, the Harris Hip Score was 100, and the patient had returned to his pre-injury level of activity (Figure 2). At the end of the 18-week follow-up period, he was completely asymptomatic.



Figure 2. Follow-up anteroposterior pelvis/right hip radiograph at 18 weeks demonstrating progressive healing/union of the right lesser trochanter avulsion fracture with resolution of displacement and no secondary complications

Discussion

Isolated avulsion fractures of the lesser trochanter are rare injuries in adolescents, representing only a small subset of all pelvic avulsion fractures. Owing to their low incidence, reports describing these cases remain limited in the literature [2, 5]. Pathological or tumoral causes were considered in the differential diagnosis. Given the patient's adolescent age and clear traumatic mechanism, the possibility of a pathological fracture was ruled out.

Radiographic evaluation on standard anteroposterior and frog-leg lateral views demonstrated an avulsion fragment displaced approximately 1 cm from the femoral shaft. Vertical displacement was measured relative to the femoral cortex. This value was below the surgical threshold of ≥ 1.5 cm described by Khemka et al. [4] and Eberbach et al. [9], supporting our decision for conservative management. The frog-leg lateral view was particularly helpful in accurately defining the fragment position and confirming the diagnosis.

These injuries usually occur following a distinct traumatic event. In adults, however, a lesser trochanter fracture with minimal trauma should raise concern for underlying pathology such as metastatic disease or osteoporosis. In adolescents, by contrast, the mechanism is almost always a sudden, forceful contraction of the iliopsoas muscle during athletic activity.

Conservative treatment generally yields favorable results. Volpi et al. [2] reported complete recovery and return to sport in 30 patients treated non-surgically, with a mean return time of 11 weeks. Ruffing et al. [7] and Metzmaker and Pappas [5] similarly observed excellent outcomes after conservative therapy, with most patients resuming full activity. McKinney and Nelson [8] advocated non-operative care for all types of lesser trochanter

avulsions, whereas surgical fixation may be considered for painful non-union, exostosis, or large ununited fragments. Eberbach et al. [9] suggested that fractures displaced more than 1.5 cm benefit from surgical intervention.

This case adds to the limited literature on lesser trochanter avulsion fractures in adolescent athletes. Patient age, mechanism of injury, and clinical presentation remain key factors in guiding diagnosis and treatment decisions. Further multicenter studies with larger patient groups are warranted to better define optimal management strategies for these rare injuries.

Recent reviews have emphasized that early mobilization and structured conservative management allow a safe return to sport in young athletes. Di Maria et al. [10] highlighted the effectiveness of early mobilization, while Schwab et al. [11] reported complete recovery and rapid return to competition in a 15-year-old sprinter treated non-operatively. In our case, pain-free full range of motion, symmetric muscle strength, and successful completion of functional tests enabled safe, criteria-based return to sport by week 18.

Conclusions

These studies demonstrate that a conservative approach is effective in the treatment of isolated lesser trochanter fractures, with the majority of patients returning to their previous activities. However, there are also perspectives in the literature that support a surgical approach. In our view, surgical intervention should be reserved for specific indications, considering the risk of heterotopic ossification. Additionally, careful monitoring for ischiofemoral impingement is essential for patients managed conservatively [6]. However, since each patient is unique, it is important to personalize the treatment process and design an appropriate rehabilitation program based on the individual patient's condition. These studies also reveal differing opinions on the most suitable method for treating lesser trochanter avulsion fractures. Factors such as the type of fracture, displacement, patient age, and general health status may all influence treatment decisions.

Author contributions

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by BC and ŞD. The first draft of the manuscript was written by BC, ŞD and all authors commented on previous versions of the manuscript. All authors read and approved of the final manuscript.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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Ethical statement

This case report was prepared in accordance with the CARE reporting guidelines. Written informed consent for publication was obtained from the patient's guardian. Ethical approval was obtained from the Firat University Non-Interventional Research Ethics Committee (Approval date: 13 March 2025, Approval number: 2025/05-39, Document date and number: 21 March 2025-33235).

ORCID iD

B.C 0009-0008-3514-1985

S.D. 0000-0002-1709-3851

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References

1. Tahir T, Manzoor QW, Gul IA, Bhat SA, Kangoo KA. Isolated Avulsion Fractures of Lesser Trochanter in Adolescents - A Case Series and Brief Literature Review. *J Orthop Case Rep.* 2019;9(1):11-14. doi:10.13107/jocr.2250-0685.1286
2. Volpi A, Matzko C, Fegghi D, Matheney T, Bharam S. Conservative Treatment of Avulsion Injuries of the Lesser Trochanter in Adolescent Athletes. *Cureus.* 2021;13(6):e15638. doi:10.7759/cureus.15638
3. Milch H. Ischial apophysiolysis: a new syndrome. *Bull Hosp Joint Dis.* 1953;14(2):188-193. PMID:13141008
4. Khemka A, Raz G, Bosley B, Ludger G, Al Muderis M. Arthroscopically assisted fixation of the lesser trochanter fracture: a case series. *J Hip Preserv Surg.* 2014;1(1):27-32. doi:10.1093/jhps/hnu006
5. Metzmaker JN, Pappas AM. Avulsion fractures of the pelvis. *Am J Sports Med.* 1985;13(5):349-358. doi:10.1177/036354658501300510
6. Herren C, Weber CD, Pishnamaz M, et al. Fracture of the lesser trochanter as a sign of undiagnosed tumor disease in adults. *Eur J Med Res.* 2015;20(1):72. doi:10.1186/s40001-015-0167-8
7. Ruffing T, Rückauer T, Bludau F, Hofmann A, Muhm M, Suda AJ. Avulsion fracture of the lesser trochanter in adolescents. *Injury.* 2018;49(7):1278-1281. doi:10.1016/j.injury.2018.04.030
8. McKinney BI, Nelson C, Carrion W. Apophyseal avulsion fractures of the hip and pelvis. *Orthopedics.* 2009;32(1):42. doi:10.3928/01477447-20090101-12
9. Eberbach H, Hohloch L, Feucht MJ, Konstantinidis L, Südkamp NP, Zwingmann J. Operative versus conservative treatment of apophyseal avulsion fractures of the pelvis in the adolescents: a systematical review with meta-analysis of clinical outcome and return to sports. *BMC Musculoskelet Disord.* 2017;18(1):162. doi:10.1186/s12891-017-1527-z
10. Di Maria F, Testa G, Sammartino F, Sorrentino M, Petrantonio V, Pavone V. Treatment of avulsion fractures of the pelvis in adolescent athletes: A scoping literature review. *Front Pediatr.* 2022;10:947463. doi:10.3389/fped.2022.947463

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11. Schwab C, Zamora R Jr, Simister SK, Eldin S, Lum ZC. Lesser Trochanter Apophyseal Avulsion Fracture: A Case Report and Review of the Literature. *Cureus*. 2024;16(6):e63236. doi:10.7759/cureus.63236