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Case Report

An Unusual Presentation of Chronic Exertional Compartment Syndrome Associated with Fascial Herniation: A Case Report

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Background: Chronic exertional compartment syndrome (CECS) is a recognized cause of activity−related leg pain, most commonly reported in young athletes. However, long−standing cases that persist for decades and present in middle−aged individuals are uncommon and may lead to delayed or challenging diagnosis. This report describes a rare case of CECS with an unusually prolonged clinical course and underscores important diagnostic considerations

Case Presentation: A 53−year−old man presented with a 37−year history of severe bilateral anterior leg pain provoked by running, physical exertion, and deep squatting. The symptoms were associated with visible, reducible fascial herniations over the anterolateral compartments of both calves. The patient reported partial symptom control through a consistent warm−up routine before activity. Clinical evaluation and intracompartmental pressure measurements supported the diagnosis of CECS. Following unsuccessful long−term conservative management, the patient underwent bilateral anterior and anterolateral compartment fasciotomies, resulting in adequate compartment decompression.

Conclusion: This case illustrates that CECS may remain unrecognized for many years and can present later in life. Visible fascial herniations may serve as an important clinical indicator, and individualized conservative measures may provide temporary symptom relief. Nevertheless, surgical decompression remains an effective treatment option when conservative strategies fail.

Keywords: Chronic exertional compartment syndrome; fascial herniations; anterior leg pain; warm-up; middle-aged; diagnostic challenge

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Introduction

Chronic exertional compartment syndrome (CECS) is a functional overuse condition in which activity-induced increases in intracompartmental pressure cause exertional pain and related symptoms that resolve with rest, reflecting a dynamic physiological process with incompletely understood mechanisms (1). CECS is frequently underdiagnosed due to unfamiliarity with its presentation and overlap with other causes of exertional leg pain, yet studies show it may account for up to one-third of diagnoses in athletes with exercise-induced leg pain (2). Accurate diagnosis of CECS usually relies on intracompartmental pressure measurement, with static post-exercise testing remaining the predominant and most accepted method in both clinical practice and research despite emerging dynamic techniques (3). Although CECS predominantly affects young athletes and military

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personnel, it can also occur in older individuals where it is often overlooked, and the presence of activity-related fascial herniations represents an underrecognized but important clinical sign of compartmental dysfunction (4).

Management of CECS includes conservative approaches such as activity modification and rehabilitation, with surgical fasciotomy reserved for persistent symptoms, while evidence for long-term nonoperative management remains limited (5). We report a rare presentation of CECS in a 53-year-old man with a 37-year history of exertional leg pain, accompanied by multiple bilateral fascial herniations and notable symptom control achieved solely through a consistent warm-up routine. This case highlights diagnostic challenges and broadens the clinical spectrum of CECS beyond the traditional athletic population.

Case Presentation

A 53-year-old otherwise healthy man presented to our clinic with bilateral anterior and lateral leg pain that had persisted for 37 years.

History of Present Illness

The patient experienced symptom onset at age 16, reporting severe (9/10) exertional bilateral leg pain triggered by running, physical activity, and deep squatting, accompanied by visible 1–2 cm protrusions over the anterolateral calves. A consistent warm-up routine markedly reduced or prevented both pain and protrusions, while symptoms, when present, resolved spontaneously within 10–15 minutes after cessation of activity.

Physical Examination

Physical examination at rest showed no tenderness, swelling, or deformity. Palpation of the anterolateral compartments identified four to five discrete, soft, reducible nodules bilaterally, each measuring approximately 1–2 cm, consistent with fascial herniations. Neurological and vascular examinations were unremarkable. We did not perform a provocative exercise test because of the expected symptom severity; nevertheless, the clinical findings strongly suggested chronic exertional compartment syndrome.

Investigations

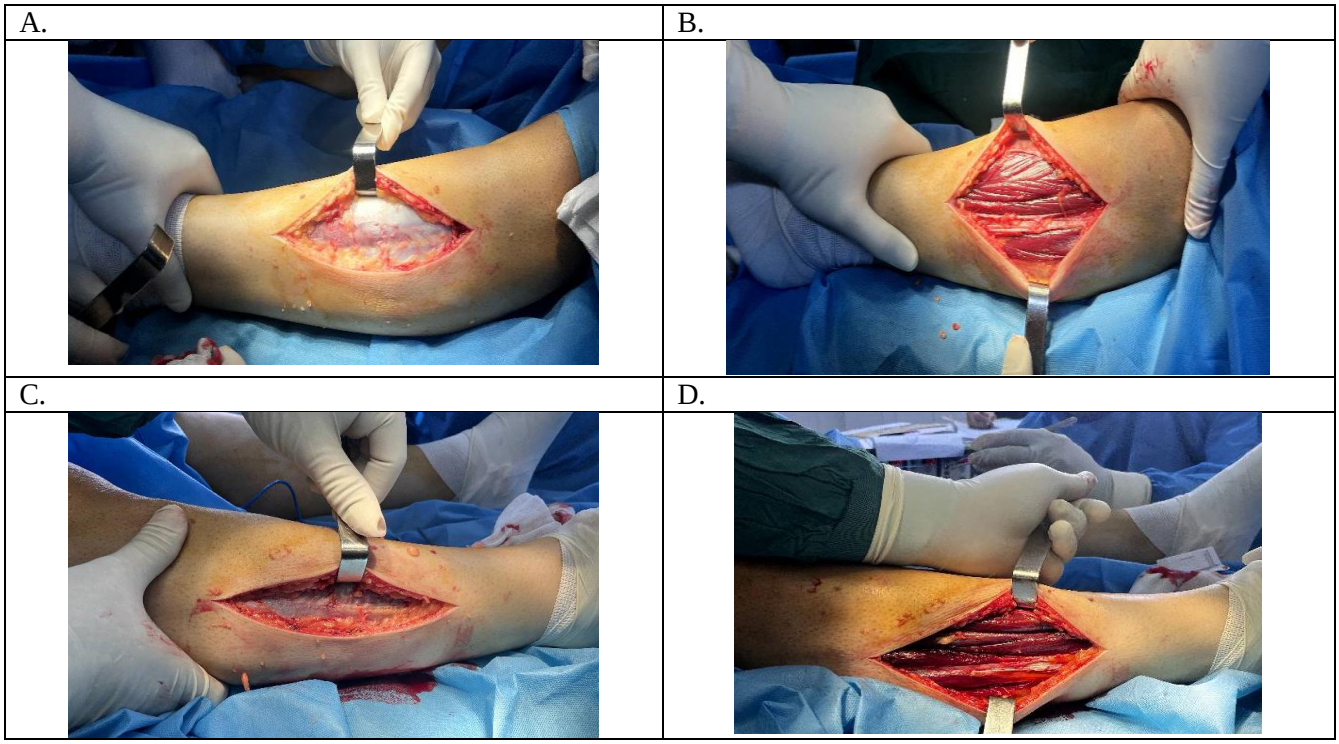


Fig. 1. Stepwise intraoperative views of bilateral anterior and anterolateral compartment fasciotomies. (A) Skin incision with exposure of the thickened deep fascia. (B) View of the anterior compartment before fascial release. (C) Longitudinal fascial incision for compartment decompression. (D) Final appearance after complete decompression of the anterior and anterolateral compartments.

Intracompartmental pressure testing was performed in the anterior and lateral compartments of both legs following exercise provocation. The measurements demonstrated elevated post−exercise compartment pressures consistent with chronic exertional compartment syndrome. The diagnosis was established according to the modified Pedowitz criteria.

Treatment and Outcome

Given the long-standing course and the patient's reported symptom control with warm-up, we reinforced an initial conservative management plan. We advised the patient to continue a structured, consistent warm-up regimen before physical activity. We also discussed surgical intervention, including fasciotomy with possible repair of symptomatic fascial herniations, as a definitive treatment option; the patient initially chose to continue conservative management.

At the 3-month follow-up, the patient reported inadequate symptom control despite strict adherence to the warm-up protocol. A subsequent period of activity modification and physiotherapy focused on biomechanical correction failed to provide meaningful relief. The patient therefore elected to proceed with surgical treatment.

The patient underwent bilateral anterior and anterolateral compartment fasciotomies without intraoperative or postoperative complications. Intraoperatively, we noted thickened fascia in the anterior and anterolateral compartments of both legs, and we achieved complete compartment release. Figure 1 illustrates the intraoperative findings, including fascial thickening and the completed compartment release.

Postoperatively, the patient reported a marked reduction in exertional pain and the absence of visible fascial protrusions during daily activities.

Discussion

This case underscores the unusual 37-year delay in diagnosing CECS, a condition typically seen in young athletes and military personnel, and illustrates how misattribution to more common causes of exertional leg pain can result in prolonged functional limitation and avoidable morbidity (6,7). This case reinforces CECS as a diagnostic consideration across a broad age range.

The presence of multiple bilateral palpable fascial herniations was a key clinical finding, arising from focal fascial weakness, and represents an underrecognized but valuable supportive diagnostic sign in CECS (4). Unlike most reported cases, where herniations appear only during athletic activity, this patient developed visible protrusions during non-athletic exertion, such as deep squatting, which suggests pronounced and long-standing compartmental dysfunction.

A distinctive aspect of this case was the patient's long-standing "warm-up phenomenon," where consistent warm-up prevented symptoms, highlighting a potential but still supported by limited evidence role for sustained conservative management in CECS (8). It should be noted that symptom improvement with a warm−up routine does not indicate resolution of the underlying pathology. Rather, the warm−up phenomenon reflects temporary modulation of symptoms, while the underlying compartment pressure abnormality persists.

The patient's response suggests that gradual muscle activation during warm-up may temporarily enhance fascial compliance and local perfusion, reducing pathological increases in intracompartmental pressure during exertion (1). This finding supports increasing interest in nonoperative management approaches but underscores that, despite conservative symptom control, surgical fasciotomy remains the definitive treatment for persistent or progressive CECS.

Although isolated muscle herniations and popliteal artery entrapment were considered, the clinical presentation and normal vascular findings favored CECS, which was objectively confirmed by intracompartmental pressure measurement (9).

Limitations

As a single case, the findings have limited generalizability, and delayed surgery restricted long-term postoperative outcome data, while the lack of dynamic pressure monitoring and standardized scores limits comparison with other studies. Nonetheless, the prolonged untreated course and consistent response to warm-up offer valuable insight into the natural history and variability of CECS.

Conclusion

This case shows that chronic exertional compartment syndrome can cause long-standing exertional leg pain and may remain underrecognized beyond the typical young

athletic population. Palpable fascial herniations should prompt careful consideration of CECS, even in middle-aged patients and during non-athletic activities. The sustained symptom control achieved with a structured warm-up routine also supports the potential value of individualized conservative management strategies. Greater awareness of atypical presentations may facilitate earlier diagnosis, reduce prolonged morbidity, guide more tailored treatment, and support appropriate timing of surgical intervention in patients with CECS.

Declaration

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Conflict of Interest

The authors declare no conflicts of interest related to the publication of this manuscript.

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Authors' contribution

All authors of the article participated in all stages.

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Ethics approval and consent to participate

This study was approved by the Ethics Committee of Babol University with the ethics code IR.MUB-ABOL.REC.1405.012. Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

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