Rev Colomb Cir. 2025;40:1205-10
https://doi.org/10.30944/20117582.2724

CASE PRESENTATION

Giant pseudoaneurysm of the superficial femoral artery as a result of a basic taekwondo maneuver (Dollyo Chagi): Case report

Pseudoaneurisma gigante de la arteria femoral superficial como resultado de una maniobra básica de taekwondo (Dollyo Chagi): Reporte de caso

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Abstract

Introduction. Although traumatic pseudoaneurysm is a relatively common event in penetrating trauma, in the case of blunt trauma related to a muscle overstretch mechanism, it becomes a diagnostic and therapeutic challenge due to its infrequent presentation.

Clinical case. A 60-year-old male patient with a history of muscle strain 10 years earlier while performing the Dollyo Chagi maneuver (basic taekwondo kick) presented with an increase in diameter at the level of the left thigh, associated with a pulsatile mass with a bruit on the inner side of the thigh.

Results. A giant pseudoaneurysm of the left superficial femoral artery was diagnosed, and the patient underwent surgery for arterial exploration. The pseudoaneurysm was repaired with femoropopliteal bypass in the left lower extremity using an ipsilateral autologous graft (inverted saphenous vein), without complications. The patient was discharged on the sixth postoperative day with satisfactory results.

Conclusion. Giant pseudoaneurysms of the superficial femoral artery should be treated once the diagnosis is made, as they carry a high risk of rupture, distal embolism, limb loss, and arteriovenous fistula formation. Educating the primary care physician and general surgeon about this mechanism of injury is essential because it is rare and requires a high level of diagnostic suspicion. Early identification and appropriate management reduce the risk of complications that can be disabling and cause high morbidity and mortality.

Keywords: vascular system injuries; femoral artery; popliteal artery; false aneurysm; angiography; vascular surgical procedures.

Received: 08/29/2024 - Accepted: 11/11/2024 - Published online: 07/01/2025
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Cite as: Ricardo-Sagra M, Pantoja-Landázuri CJ. Pseudoaneurisma gigante de la arteria femoral superficial como resultado de una maniobra básica de taekwondo (Dollyo Chagi): Reporte de caso. Rev Colomb Cir. 2025;40:1205-10. https://doi.org/10.30944/20117582.2724
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Resumen

Introducción. Aunque el pseudoaneurisma traumático es un evento relativamente frecuente en trauma penetrante, en caso de trauma cerrado relacionado a un mecanismo de sobredistensión muscular, se convierte en un reto diagnóstico y terapéutico por su presentación infrecuente.

Caso clínico. Paciente masculino de 60 años, con antecedente de sobredistensión muscular 10 años antes, mientras realizaba maniobra de *Dollyo Chagi* (patada básica de taekwondo), quien consultó por presentar aumento del diámetro a nivel del muslo izquierdo, asociado a masa pulsátil con soplo en cara interna del muslo.

Resultados. Se diagnosticó un pseudoaneurisma gigante de la arteria femoral superficial izquierda, por lo que se llevó a cirugía para exploración arterial. Se hizo corrección del pseudoaneurisma con derivación femoropoplítea en el miembro inferior izquierdo con injerto autólogo ipsilateral (vena safena invertida), sin complicaciones. El paciente egresó al sexto día postoperatorio con evolución satisfactoria.

Conclusión. El pseudoaneurisma gigante de la arteria femoral superficial debe resolverse una vez realizado el diagnóstico, ya que presenta un alto riesgo de ruptura, complicaciones de embolia distal, pérdida de la extremidad y formación de fístulas arteriovenosas. Es necesario educar al médico de primer contacto y al cirujano general sobre este mecanismo de lesión porque es poco frecuente y se necesita una alta sospecha diagnóstica. La identificación temprana y el manejo adecuado disminuyen el riesgo de complicaciones que pueden ser discapacitantes y con elevada morbimortalidad.

Palabras clave: lesiones del sistema vascular; arteria femoral; arteria poplítea; aneurisma falso; angiografía; procedimientos quirúrgicos vasculares.

Introduction

Pseudoaneurysms result from injury to the wall of an arterial vessel, with subsequent extravasation of blood into nearby tissues, forming a fibrous capsule that grows progressively due to increased blood pressure [1]. The most frequent cause of this pathology is iatrogenic injury secondary to catheterization and penetrating trauma, advanced atherosclerotic disease, or connective tissue disorders [2]. However, rare causes such as infections have been described [3]. Blunt trauma is even less frequent when related to overdistension and rotation maneuvers of the extremities [4].

Management of pseudoaneurysms may involve either open or endovascular techniques, depending on patient-specific characteristics and the mechanism of injury. The objective of this report was to describe the case of a patient with a pseudoaneurysm of the superficial femoral artery diagnosed ten years after trauma with an unusual pathophysiological mechanism.

Clinical case

A 60-year-old male with a medical history of hypertension and chronic kidney disease, and a history of a muscle tear in his left lower extremity following a Dollyo-Chagi maneuver (a basic taekwondo kick) ten years prior, progressively developed a mass on the inner aspect of his left thigh. An ultrasound study was performed, ruling out arteriovenous pathology.

He was admitted to our institution with a two-month history of left lower extremity pain at rest and ischemic and inflammatory changes, including blisters and functional limitation of the foot (Figure 1). Physical examination of the extremity revealed distal pallor and coldness associated with absent dorsalis pedis and posterior tibial pulses.

Lower limb arterial Doppler showed occlusion at the level of the popliteal artery, without distal flow, and CT angiography revealed a partially thrombosed pseudoaneurysm in the distal

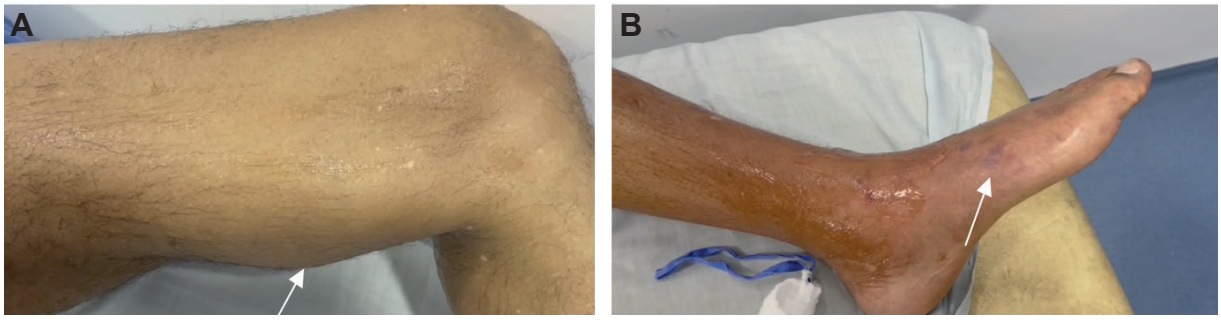


Figure 1. A. A mass is observed in the middle third of the left thigh (arrow). **B.** Ischemic and inflammatory changes in the leg, with an area of blisters (arrow).

Source: Photographs taken by the authors.

superficial femoral artery. Digital subtraction angiography was performed, revealing a giant pseudoaneurysm in the left distal superficial femoral artery (Figure 2) and occlusion of the distal vessels. Therefore, emergency surgical intervention was deemed necessary to correct the pseudoaneurysm via femoropopliteal bypass.

An approach was made in the distal third of the left thigh to explore the lower limb vessels, and a giant pseudoaneurysm of the distal superficial femoral artery, measuring more than 10 cm, was identified (Figure 3).

Due to the size of the lesion and the atrophy of the popliteal and infrapopliteal arteries, a bypass was performed using an inverted saphenous vein graft to the third segment of the popliteal artery, without complications (Figure 4). Postoperatively, the patient received full-dose anticoagulation and analgesics in the inpatient ward. The patient was discharged on the sixth postoperative day due to clinical improvement, with recovery of distal perfusion in the foot.

Discussion

A pseudoaneurysm is a pulsatile, encapsulated hematoma whose walls are formed by the surrounding tissue of the artery, unlike a true aneurysm, where the walls are those of the vessel itself [5]. The most frequent symptom is the presence of a progressively growing, pulsatile mass, associated with hematoma and edema [2,6]. Additionally, it may present with intermittent claudication or, as in the case presented, with acute ischemia requiring immediate surgical intervention due to the high risk of limb loss.

It is believed that the presented case resulted from a low-magnitude blunt trauma to the left thigh, as a consequence of a basic taekwondo maneuver called the Dollyo-Chagi maneuver. This maneuver consists of a movement comprising four stages involving the elbow, shoulder, spine, hip, knee, and ankle [4]. During the contact phase, extension of the left knee causes muscle overdistension, resulting in injury to the arterial wall. The chronic evolution (after ten years) and complications of distal embolism are noteworthy.

Giant pseudoaneurysms of the femoral artery, due to their high risk of bleeding, distal embolism, and arteriovenous fistula formation, should be treated once diagnosed [2]. For diagnosis, a thorough medical history is recommended to ascertain any history of trauma, percutaneous or surgical interventions, and to explore for signs of vascular injury during the physical examination [2].

Imaging studies should initially include color Doppler ultrasound, which can reveal the characteristic "yin-yang" sign [6], demonstrating inflow and outflow [7]. This is complemented by computed tomography angiography and/or arteriography, which allow for better evaluation of the arterial segments involved and facilitate surgical planning [8,9].



Figure 2. Arteriography of the left lower limb showing the giant pseudoaneurysm at the level of the left distal superficial femoral artery (arrow).

Source: Photographs taken by the authors.

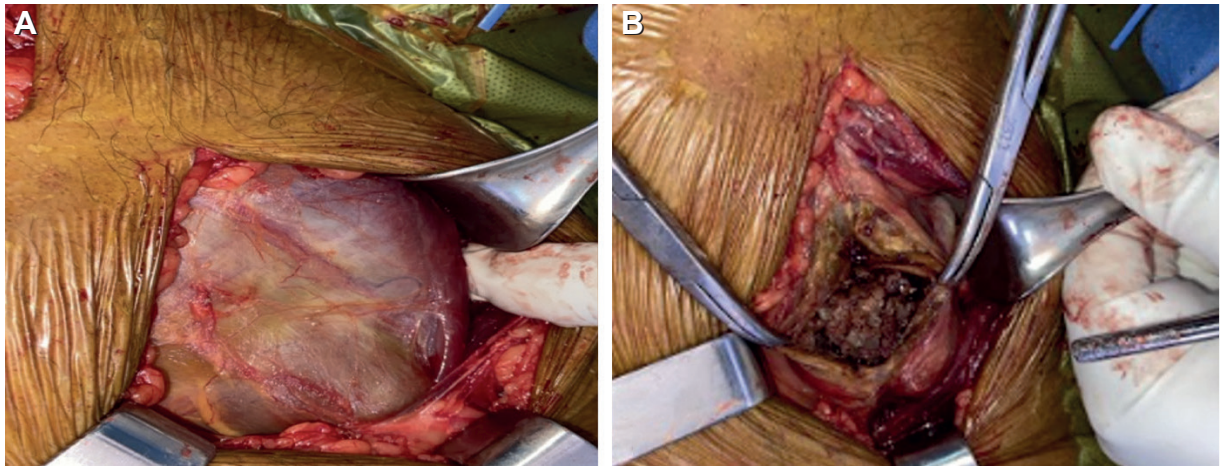


Figure 3. A. Exploration of lower limb vessels. A giant pseudoaneurysm of the distal superficial femoral artery, measuring more than ten cm, is observed. **B.** Opening of the sac and endarterectomy.

Source: Photographs taken by the authors.

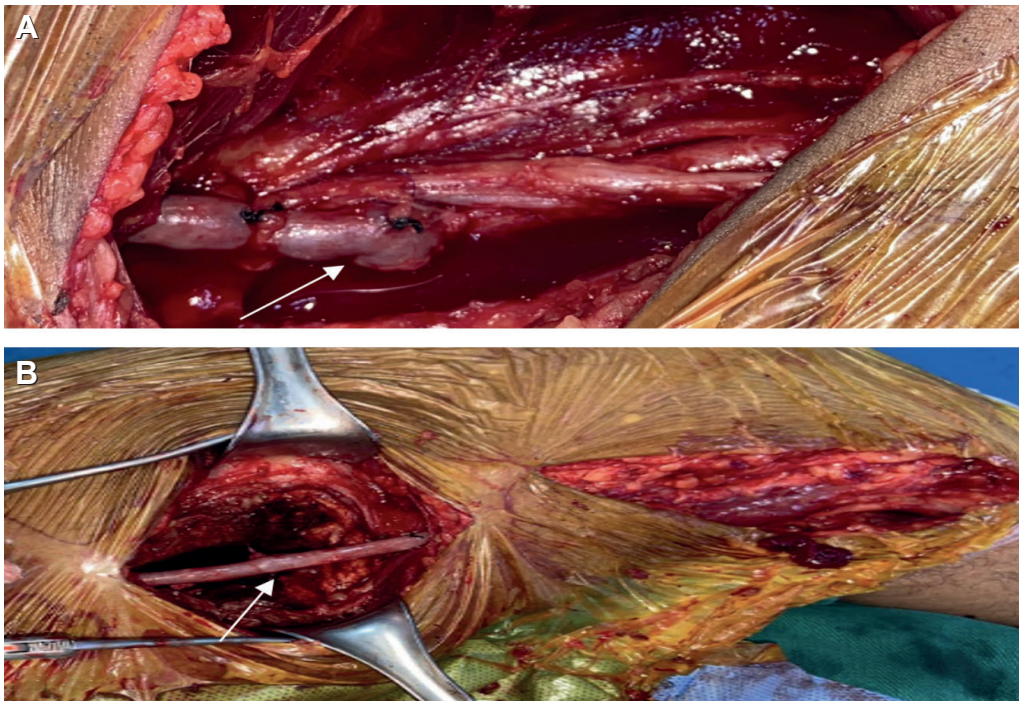


Figure 4. A. Reversed saphenous vein graft with end-to-side anastomosis to the third portion of the popliteal artery (arrow). **B.** Reversed saphenous vein graft with proximal anastomosis to the superficial femoral artery (arrow).

Source: Photographs taken by the authors.

The goal of treatment should be to restore pulsatile arterial flow; therefore, open surgery remains the preferred method for its management [5-7]. In this particular case, due to the involvement of the popliteal artery, endovascular management is still debated and has high rates of reintervention and treatment failure. However, endovascular management has advantages in other vascular segments, with a lower rate of local complications and surgical risk [10].

Conclusions

Pseudoaneurysm of the superficial femoral artery in blunt trauma is an unusual presentation, requiring a high index of clinical suspicion for its diagnosis. The patient sustained a minor blunt trauma as a result of a Taekwondo maneuver, which caused injury to the arterial wall. Due to a poorly understood mechanism of injury and nonspecific symptoms, complications arose ten years later, culminating in acute limb ischemia. A clear understanding of the initial approach to trauma, the appropriate use of specific diagnostic tests, and ensuring continuity of care until optimal and timely treatment are achieved are essential to reduce associated morbidity and mortality, as well as negative consequences such as amputations.

Compliance with ethical standards

Informed consent: The authors declared that they have obtained consent from the patient and their family for the publication of this clinical case and related images.

Conflicts of interest: The authors declared no conflicts of interest in the publication of this case.

Use of Artificial Intelligence: The authors declared that they did not use artificial intelligence-assisted technologies in the preparation of this article.

Funding sources: The funding for this research project came entirely from contributions by the authors.

Authors' contributions:

- Conception and design of the study: Michael Ricardo-Sagra.
- Data acquisition: Cindy Juliana Pantoja-Landázuri.
- Data analysis and interpretation: Cindy Juliana Pantoja-Landázuri.
- Manuscript writing: Michael Ricardo-Sagra, Cindy Juliana Pantoja-Landázuri.
- Critical review and final approval: Michael Ricardo-Sagra.

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