

# Spontaneous Dissection of the External Iliac Artery Secondary to Golf Club Manufacturing

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## Abstract

Spontaneous dissection of the external iliac artery in the absence of aortic disease is extremely uncommon. We report the conservative treatment of a 46-year-old male patient who presented with acute left lower limb ischemia due to an isolated dissection of the external iliac artery secondary to repetitive swinging movements during golf club manufacturing. Although syndromes of nonatherosclerotic vascular disease secondary to repetitive movements in high-level athletic activity have been previously described in cyclists, long distance runners, and rugby players, we believe this to be the first occupational case associated with golf.

## Keywords

artery, dissection, golf, iliac

## Introduction

Spontaneous dissection of the external iliac artery in the absence of aortic disease is extremely uncommon. We report the conservative treatment of a 46-year-old male patient who presented with acute left lower limb ischemia due to an isolated dissection of the external iliac artery secondary to repetitive swinging movements during golf club manufacturing. Although syndromes of nonatherosclerotic vascular disease secondary to repetitive movements in high-level athletic activity have been previously described in cyclists, long distance runners, and rugby players, we believe this to be the first occupational case associated with golf.<sup>1-6</sup>

## Case Report

A 46-year-old male presented to the emergency department with a sudden onset of severe left groin pain which radiated down the lateral aspect of his leg. He had difficulty with weight bearing and complained of left foot numbness. He had no significant past medical or surgical history. He was a smoker of 7 cigarettes per day and had no other cardiovascular risk factors. He was not prescribed any medications. There was no family history of vascular or connective tissue disorders. He was employed as a golf club manufacturer which necessitated field testing of the equipment which often entailed hundreds of golf swings and ball strikes per day.

On examination, he was hemodynamically stable with a normal sinus rhythm of 84 beats per minute and blood pressure of 128/82 mm Hg. He had an acutely ischemic left lower limb with decreased sensation and absent distal pulses. A computed tomography (CT) angiogram revealed a dissection of the left external iliac artery originating 1.0 cm distal to the left common iliac bifurcation extending beyond the origin of the profunda femoris artery over a total distance of 15 cm (Figure 1). The left deep circumflex iliac and profundus femoris arteries arose from the smaller true lumen, while the deep external pudendal artery arose from the false lumen.

Following transfer to the regional vascular unit, his symptomatology had improved with restoration of normal color, temperature, and pedal pulses. Due to continuing improvement, he was treated conservatively with therapeutic subcutaneous enoxaparin (1.5 mg/kg = 120 mg) and best medical therapy of aspirin 75 mg mane and simvastatin 40 mg nocte. Repeat CT angiogram 4 days following symptomatic onset confirmed

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**Figure 1.** Contrast-enhanced computed tomography (CT) angiogram demonstrating a dissection of the left external iliac artery (white arrow).

the absence of flow in the false lumen and no evidence of dissection extension, where the true lumen was perfusing the lower limb satisfactorily. He was discharged from the hospital on day 5. A follow-up magnetic resonance (MR) angiogram 2 weeks later identified an intimal defect in the proximal external iliac artery which appeared to have improved from the previous imaging. There was no evidence of a hemodynamically significant stenosis at this level (Figure 2).

At outpatient review 7 months later, he remained asymptomatic and described no impairment of his lower limb mobility. A follow-up MR angiogram confirmed no extension of the dissection. He has subsequently discontinued smoking and remains on antiplatelet and statin therapy. He has returned to work but has reduced his level of activity. Outpatient follow-up has been arranged at 6 monthly intervals.

## Discussion

External iliac arterial dissection, defined as the separation of the external iliac artery intimal lining from the corresponding adjacent media, remains rare. Etiology is often associated with connective tissue disorders including Marfan syndrome,  $\alpha 1$  antitrypsin deficiency, fibromuscular dysplasia, and Ehler Danlos syndrome. As an uncommon distinct entity leading to intimal thickening with fibrosis without associated atherosclerosis, arterial endofibrosis may also cause arterial dissection as a result of the chronic intensive trauma due to repeated movements commonly seen in highly trained athletes especially in cyclists. Our patient described the manufacture and occupational testing of golf clubs which often necessitated golf club swinging and ball striking more than 100 times per day. Apart from smoking and in the absence of any other triggering mechanism, we speculate that this repetitive activity may have precipitated the initial intimal tear and subsequent dissection.

The forward swing in golfing is where the speed and power is generated and involves lateral rotation of the hip from right



**Figure 2.** Follow-up magnetic resonance angiogram (MRA) confirming resolution of the left iliac arterial dissection (the 2 areas of possible narrowing at the proximal and distal aspects of the left common iliac artery were deemed an overall on MRA following reconstruction).

to left in a right-handed golfer. This may precipitate external iliac artery dissection by a similar mechanism to that previously documented in cyclists, where the mid-portion of the external iliac artery is subjected to high shear forces and high blood flow during repetitive exercise leading to an inflammatory reaction. External iliac artery dissection has also been described in association with other high level sporting activities including triathlon, running, rowing, and even occupations such as roofing (Table 1).

Investigative modalities are usually dictated by clinical presentation. An acutely ischemic lower limb will warrant urgent cross-sectional imaging with a CT or MR angiogram, while chronic or atypical symptoms may require escalation of modalities as required commencing with arterial duplex. Management options include close observation and follow-up imaging in the presence of symptomatic resolution, while antiplatelet and statin, the best medical therapies, may be warranted in the presence of cardiovascular risk factors. Emergency therapeutic intervention is required for the “at risk” limb. Therapeutic options include endovascular intervention with balloon angioplasty and stenting. Surgical intervention may include localized resection and primary suture if a short segment of the artery is involved. However, a conventional iliofemoral bypass or an extra-anatomical femoro-femoral bypass are more commonly utilized in this patient group due to disease extent.<sup>8,9</sup>

Patient follow-up strategies must consider occupational modification advice, commencement of best medical therapy,

**Table 1.** Epidemiological Data of All Published Patients With External Iliac Artery Dissection Secondary to Sport-/Occupational-Related Activity.

	Author	Year	Sex	Age (years)	Associated Activity	Symptoms	Treatment	Outcome
1	Cook <sup>2</sup>	1995	F	50	Running	Claudication	Angioplasty + stent	Cured
2	Cook <sup>2</sup>	1995	M	45	Triathlon	Claudication	Open repair and interposition dacron graft iliofemoral bypass	Cured
3	Cook <sup>2</sup>	1995	M	50	Rowing	Claudication	Conservative	Cured
4	Fukui <sup>3</sup>	2007	M	49	Cycling	Claudication	Open repair and reversed saphenous vein iliofemoral bypass	Cured
5	Wilson <sup>5</sup>	2010	M	47	Cycling	Claudication	Open repair and interposition dacron graft iliofemoral bypass	Cured
6	Sedivy <sup>7</sup>	2011	M	41	Roofing	Severe leg pain	Ilio-femoral bypass	Cured

and surveillance imaging. As conservative treatment was used in this case, an early inpatient cross-sectional imaging scan was performed to assess true/false lumen flow and dissection morphology in the presence of symptomatic improvement. As many of these patients are young, it is important to consider the cumulative effects of imaging particularly radiation whereby ultrasound/duplex and MR imaging may be preferable to CT.

## Conclusion

Dissection of the external iliac artery as a consequence of golfing has not been previously reported in the literature to our knowledge. The diagnosis should be considered in any young, fit patient presenting with lower limb ischemia and groin pain whose profession involves a high level of repetitive movement. Early diagnosis can lead to instigation of appropriate treatment in order to facilitate return to employment.

## Declaration of Conflicting Interests

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