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## Gangrenous manifestation of thromboangiitis obliterans (Buerger's disease) in a chronic smoker: A case report

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### Abstract

Thromboangiitis Obliterans (Buerger's disease) is a rare but severe form of peripheral vascular disease (PVD) closely linked to chronic tobacco use. This case discusses a 40-year-old male chronic smoker who developed advanced PVD, culminating in dry gangrene of the left lower limb and necessitating an above-knee amputation. This case underscores the aggressive progression of PVD in the context of chronic smoking, highlighting the diagnostic challenges and the critical therapeutic decisions involved. It emphasizes the urgent need for early intervention and smoking cessation to prevent severe complications such as limb amputation. Key features include the pathophysiology of Buerger's disease, its association with tobacco use, and the significant impact of timely medical management and lifestyle modifications on patient outcomes.

**Keywords:** Dry gangrene, peripheral vascular disease, tobacco smoking, color doppler, angiography

### Introduction

#### Case report

A 40-year-old male with a 20-year history of smoking approximately one pack of cigarettes per day presented with a six-month history of progressive pain and tingling sensation in the left lower limb. Initially, the pain was intermittent and associated with walking (claudication), but it escalated to constant rest pain over the past month, severely affecting his quality of life and sleep. He also reported noticing black discoloration that started from the toes and rapidly progressed to involve the entire foot and lower limb over a few weeks. Despite the severity of his symptoms, he delayed seeking medical attention until the condition worsened significantly.

The patient's past medical history was unremarkable except for his heavy smoking habit. He denied any history of diabetes mellitus, hypertension, or hyperlipidemia. He had no known allergies and was not on any regular medications. There was no family history of vascular diseases, and he had not experienced any previous episodes of vascular or thrombotic events. He worked as a construction laborer and mentioned that his symptoms had increasingly hindered his ability to perform his job.

Upon physical examination, several critical findings were noted. The left lower limb was markedly cold to the touch, with an absence of dorsalis pedis, posterior tibial, and popliteal arterial pulses, indicating severe vascular compromise. The skin exhibited a mottled appearance with clear demarcation lines, and blackened areas on the lower limb involving both anterior and posterior regions just below the knee joint were consistent with dry gangrene. Capillary refill time was significantly prolonged, and the limb showed signs of muscle atrophy. There was a marked difference in temperature and color compared to the right lower limb, which retained normal warmth and coloration. Additionally, the patient reported severe tenderness upon palpation of the affected areas.

Diagnostic workup included laboratory tests and imaging studies. Blood tests revealed normal glucose levels, lipid profile, and renal function, ruling out common risk factors for peripheral vascular disease other than smoking. Diagnostic imaging, including a color doppler and an angiogram, confirmed the diagnosis of severe peripheral arterial disease with extensive occlusion from the distal left femoral artery to the foot. The angiogram showed multiple areas of segmental occlusions and collaterals, typical of Thromboangiitis Obliterans (Buerger's disease). Despite multiple vascular interventions, including angioplasty and attempts at revascularization, the patient's condition did not improve. The gangrenous changes were extensive and irreversible.

Given the severity of the ischemia, the progression of gangrene, and the patient's intractable pain, the decision was made for an above-knee amputation to manage pain and prevent further systemic complications such as sepsis.

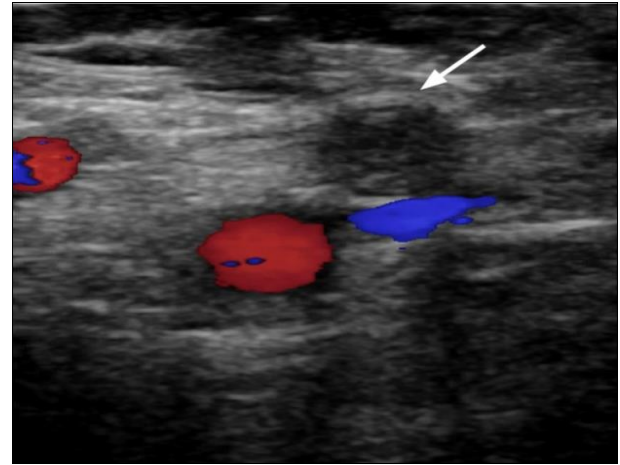
### Discussion

This case highlights the impact of smoking on the progression of peripheral vascular disease (PVD), specifically Thromboangiitis Obliterans (TAO), commonly known as Buerger's disease. TAO is a non-atherosclerotic, segmental inflammatory disease that primarily affects the small and medium-sized arteries and veins of the extremities. It is strongly associated with tobacco use, with nearly all patients being smokers [1, 2]. The disease typically presents in younger males and is characterized by acute inflammation and thrombosis of the vessels, leading to ischemia and, in severe cases, gangrene [3]. In this case, the patient, a 40-year-old chronic smoker, developed severe PVD, which rapidly progressed to dry gangrene of the left lower limb, necessitating an above-knee amputation. This underscores the aggressive nature of TAO in individuals who continue to smoke, as smoking exacerbates the condition by promoting arterial inflammation, endothelial dysfunction, and reduced oxygen supply [4, 5]. These factors collectively contribute to the accelerated progression of peripheral arterial disease in smokers. The patient's symptoms, physical examination findings, and diagnostic imaging were all indicative of TAO, with the rapid progression of pain, tingling, and gangrene demonstrating the severe impact of continued tobacco use.

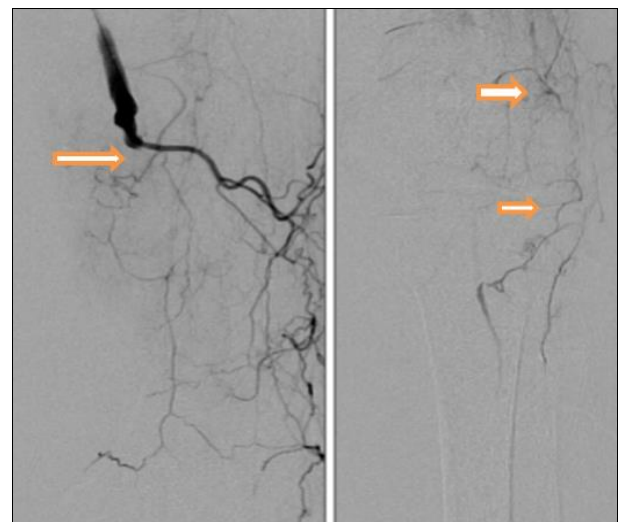
Management of TAO involves a multifaceted approach, with the cornerstone being complete cessation of tobacco use [6, 7]. Continued smoking leads to relentless progression of the disease and poor outcomes. In this case, the patient's ongoing smoking habit significantly contributed to the severity of the disease. Medical management may include antiplatelet agents to reduce thrombosis and vasodilators to improve blood flow. Statins, although primarily used for atherosclerotic disease, may also provide vascular protection [8, 9]. Surgical interventions, such as bypass grafting or endarterectomy, may be attempted in cases where revascularization is possible. However, in advanced stages with extensive gangrene, as seen in this patient, amputation becomes necessary to prevent systemic complications like infection and sepsis [10]. Despite multiple attempts at revascularization, the patient's condition did not improve due to the extensive and irreversible nature of the vascular occlusions. The decision for an above-knee amputation was made to manage the severe pain and prevent further systemic complications. This case underscores the critical need for early intervention and aggressive management of TAO, emphasizing the pivotal role of smoking cessation in preventing severe outcomes.



**Fig 1:** Gross appearance of the left lower limb showing dry gangrene with line of demarcation



**Fig 2:** Color Doppler sonogram at inguinal level. Color flow is absent in the superficial femoral artery (arrow), Red vessel is deep femoral artery and blue is collapsed femoral vein



**Fig 3:** The angiogram showed multiple areas of segmental occlusions (arrow) and collaterals (arrow), typical of thromboangiitis obliterans (Buerger's disease)

### Conclusion

Chronic smoking significantly accelerated the progression of peripheral vascular disease in this patient, leading to an above-knee amputation. This case underscores the severe impact of smoking on Thromboangiitis Obliterans (Buerger's Disease) and highlights the importance of comprehensive diagnostic evaluations and timely interventions. Key investigations, such as physical examination and angiography, confirmed the diagnosis and severity. Aggressive risk factor modification, particularly smoking cessation, early treatment, and a multifaceted management approach are essential in preventing severe outcomes in PVD.

### Conflict of Interest

Not available.

### Financial Support

Not available.

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