

CASE REPORT

Decreasing tobacco use promotes ulcer healing in a patient with Buerger's disease

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Abstract

Tobacco cessation remains the mainstay treatment for Buerger's Disease; however, limited research exists examining the effect of decreased tobacco use rather than cessation in improving symptoms. We describe a case of a patient with Buerger's disease who experienced ulcer healing and pain improvement through reduced tobacco use.

KEYWORDS

dermatology, hematology, pharmacology, vascular surgery

1 | INTRODUCTION

Thromboangiitis obliterans (TAO), or Buerger's disease, is a rare segmental occlusive inflammatory condition that affects the distal small and medium-sized blood vessels of the upper and lower extremities. Buerger's disease more commonly affects young to middle-aged males who are heavy smokers.¹ The condition is rarer in women as reports indicate that the prevalence of TAO in women is 11%–23%.²

The cause of TAO is unknown, but research has demonstrated that there is a strong association between tobacco use and Buerger's disease.³ The condition initially presents with claudication of the legs, feet, arms, and hands, which can progress to disabling pain in these locations at rest. As the disease progresses, patients may present with ischemic ulcers and gangrene of the toes and fingers.¹ In severe cases of TAO where there is tissue death, amputations may be indicated.⁴ Patients may also present with migratory superficial thrombophlebitis or Raynaud's phenomenon.⁵

The definitive treatment for Buerger's disease is tobacco cessation.³ The literature focuses on tobacco cessation as the definitive treatment for TAO in order to

prevent disease maintenance and progression as well as to prevent amputations. However, limited research has been performed to examine the effect of decreased tobacco use rather than complete cessation in improving the symptoms of patients with Buerger's disease. We report a case of a patient with a history of Buerger's disease who had an improvement in ulceration and pain through the reduction of tobacco even without discontinuation of smoking. She claimed she had cut her tobacco use by approximately one half.

2 | CASE PRESENTATION

A 49-year-old Caucasian woman with a history of Buerger's disease and hypertension presented to the dermatology clinic reporting painful, ulcerated fingertips. The patient's painful, ulcerated fingertips were due to TAO since other conditions causing occlusive vascular disease including autoimmune diseases, hypercoagulable states, and diabetes were excluded. The patient was currently smoking 10 to 12 cigarettes a day. On physical examination, the fourth finger on her left hand was ulcerated (Figure 1). The fingertips on her bilateral hands

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FIGURE 1 Fourth finger on the left hand was ulcerated. The skin of the fingers and hand were blanched.



FIGURE 2 Skin color returned to normal, and there was partial healing of her ulceration.

were dry, white appearing, and painful. The patient was administered two Ketorolac injections, each 30 mg, and was started on topical nitroglycerin 2% to apply to her fingertips four times daily with glove occlusion, bupropion HCl 150 mg daily, and nifedipine 30 mg three times daily. Finally, the patient was counseled on the ramifications of tobacco use and was urged to quit. The patient was then requested to follow up in 2 weeks.

Since her initial visit, the patient decreased tobacco use from 12 cigarettes a day to six cigarettes a day, half the previous amount, and her husband switched from smoking inside the house to outside. Her fingertips continued to be painful, but her left ring finger ulceration diminished in

size. A biopsy was not performed at this visit due to pain and concern of a nonhealing biopsy site. The patient was started on gabapentin 100 mg three times daily, and bupropion HCl was increased from 150 mg to 200 mg daily. Furthermore, the patient continued treatment with topical nitroglycerin and began alternating between acetaminophen and naproxen. The patient was then told to return 2 weeks later where the pain on her fingertips was found to have subsided. Her left ring finger ulceration was significantly smaller than previous visits, and the palm and fingers returned to their normal color (Figure 2).

3 | DISCUSSION

Buerger's disease has a strong association with tobacco use, and the mainstay treatment for this condition is tobacco cessation.³ The prognosis of TAO largely depends on the patient's ability to discontinue tobacco smoking.⁶ In a retrospective case series involving 110 patients with Buerger's disease, 43% had 108 amputation procedures. Of the individuals who continued smoking, 19% needed a major amputation. Of the individuals who stopped smoking, none of them underwent amputation.⁷ There have been other therapeutic options cited in the literature for the improvement of symptoms of Buerger's disease. However, they are not as effective as tobacco cessation.¹ These therapeutic options include supportive care, vasodilator therapy, intermittent pneumatic compression, spinal cord stimulation, and peripheral periarterial sympathectomy.^{3,8}

There is minimal research that exists examining the consequences of reducing tobacco use in patients with Buerger's disease. Cooper et al. reported that smoking cessation is crucial because a few cigarettes a day can lead to disease progression. However, our patient was able to have ulcer healing and pain improvement even with smoking six cigarettes a day, half the previous amount.⁴ Fazeli et al. performed a study on 108 patients with Buerger's disease. The average age of starting cigarette smoking was 21 years old and the average number of cigarettes smoked per day was one pack. The study involved a multivariate analysis and showed that the duration of smoking has a strong relationship with major amputation, but it could not demonstrate the effect of the number of cigarettes smoked a day on limb salvage. The study determined that smoking cessation allows individuals to avoid amputations but reducing the number of cigarettes a day did not have an effect on avoiding amputations.⁶

Our case is particularly noteworthy because the patient was able to have an improvement in her symptoms, namely ulceration and pain, by decreasing tobacco use even without smoking cessation. In addition to decreasing tobacco use, the patient avoided secondhand smoke as her

husband began smoking outside. In fact, the use of or exposure to tobacco plays a critical role in the initiation and progression of TAO.¹ The avoidance of secondhand smoke may have played a role in promoting improvement.

Along with decreasing tobacco use and avoiding secondhand smoke, our patient underwent vasodilator therapy, which involved topical nitroglycerin and oral nifedipine. Previous reports involving patients with TAO have addressed the use of vasodilators in reducing vasospasm and improving pain-free walking distance.⁹ The only vasodilator that has been studied in patients with Buerger's disease is Iloprost. A study determined that IV Iloprost was more effective than aspirin at healing ulcers, reducing pain at rest, and decreasing the rate of amputations.¹⁰ Other vasodilators including α -blockers, calcium channel blockers, and sildenafil might be helpful. However, they have not been investigated in prospective clinical trials.⁸ From our case, nifedipine and frequent application of topical nitroglycerin with glove occlusion may improve the disease outcome and decrease symptoms of Buerger's disease.

Physicians should be aware that decreasing tobacco use and avoiding secondhand smoke may lead to ulcer healing and pain improvement in patients with Buerger's disease even in the absence of tobacco cessation. Furthermore, vasodilator therapy with medications such as nitroglycerin or nifedipine may also play a role in leading to the aforementioned outcomes. The patient in our case experienced ulcer healing and pain improvement from reduced tobacco consumption, in the setting of avoidance of secondhand smoke and usage of vasodilators. This study is, however, limited by its sample size. Therefore, larger and controlled studies should be performed to support the efficacy of decreasing tobacco use and employing topical nitroglycerin or oral nifedipine in improving symptoms in patients with Buerger's disease.

AUTHOR CONTRIBUTIONS

Sandra Jaronwanichkul: Conceptualization; data curation; formal analysis; investigation; writing – original draft; writing – review and editing. **John Hall:** Conceptualization; supervision; writing – review and editing.

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IRB APPROVAL STATUS

This was reviewed and approved by institutional IRB.

CONSENT

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

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