Successful Intravenous Regional Sympathetic Blockade (Bier’s Block) with Guanethidine and Lidocaine in a Patient with Advanced Buerger’s Disease (Thromboangiitis Obliterans)

A Case Report

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A 65-year-old man, a heavy smoker with Buerger’s disease (thromboangiitis obliterans), presented to this department with persistent severe ischemic rest pain at the fingers of his right hand, not responding to oral treatment with vasodilators and analgesics. Critical blood flow was discovered in the middle, ring, and little finger, with ischemic ulcers apparent in the fingertips of these 3 fingers. The distal phalanx of the little finger had been amputated 6 months before because of gangrenous necrosis. In an attempt to avoid further disabling amputations, the patient received 3 series of Bier’s block sessions with guanethidine and lidocaine according to a specific protocol. Marked increase in finger blood flow was induced even after the first series, and complete disappearance of both fingertip ulcerations and ischemic rest pain was achieved. No side effects were observed. The above-described method in a patient with advanced Buerger’s disease resulted in excellent pain relief and full restoration of both blood flow and function of the affected fingers.

Introduction

Thromboangiitis obliterans (Buerger’s disease) is a smoking-related, nonatherosclerotic segmental inflammatory disease that most commonly affects the small- and medium-sized arteries of upper and lower extremities. It usually begins with ischemia of the distal small arteries and veins, followed by involvement of more proximal arteries, as the disease progresses. Initially, it manifests with claudication of the feet, legs, hands, or arms. Ischemic rest pain, nonhealing ulcerations, or gangrene may develop, if cigarette smoking is not discontinued. Eventually, digit or even limb am-

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putation may be necessary, a situation not un-
common for these patients.

Various therapeutic regimens have been sug-
gested, but no definitive treatment plan is set so 
far. Multiple studies have been made, focusing 
on different pharmacologic agents, with variable 
success.

In the present report, a specific therapeutic 
regimen was followed, and was proven to be suc-
cessful in both relieving pain and stopping the 
progression of gangrene in the affected digits. 
Moreover, with this simple and safe method, al-
ready existing ulcerations were completely 
healed, and the patient managed to avoid further 
disabling amputations.

Case Report

A 65-year-old man, a heavy smoker (50 cigarettes 
per day for more than 40 years), presented to this 
outpatient department, complaining of constant, 
extremely intense, and disabling digital pain of 
his right hand. He mentioned that oral drug treat-
ment with paracetamol and aspirin had not ame-
liorated the pain, nor did previous treatment with 
vasodilative medication prescribed by his vascular 
surgeon. Six months previously he had suffered 
an amputation of the distal phalanx of the little 
finger, owing to gangrenous necrosis caused by 
Buerger’s disease. He felt the only solution was 
amputation of the remaining affected digits.

The clinical examination revealed severe is-
chemic alterations of the middle and distal pha-
langes of the middle, ring, and little fingers 
(Figures 1, 2). The Allen test\textsuperscript{2} was positive, in-
dicating a lack of capillary refill and a severely 
affected vascular microcirculation. Self-evalu-
ation of rest pain by the patient in the 1-to-10 
Visual Analogue Scale\textsuperscript{3} [VAS] (0 = no pain, 10 
= unbearable pain) produced scores that ranged 
from 8 to 10.

In an attempt to avoid further amputation of 
the remaining digits, a therapeutic scheme based 
on intravenous regional sympathetic block with 
guanethidine and lidocaine using Bier’s arterial 
arrest,\textsuperscript{4} was followed, namely:

1. Five sessions (one on every 3rd day), each 
composed of intravenous regional administra-
tion of 20 mg guanethidine (Ismelin\textsuperscript{®}, 
Sovereign Medical, Essex, Great Britain) and 
100 mg lidocaine (Xylocaine\textsuperscript{®}, Astra Zenece, 
Sweden).
2. Ten sessions (one on every 10th day), each composed of intravenous regional administration of 10 mg guanethidine and 100 mg lidocaine.

3. Eight sessions (one on every 15th day), each composed of intravenous regional administration of 10 mg guanethidine and 100 mg lidocaine.

This therapeutic scheme gave the following results:

1. After the first 5 sessions, the pain in all 3 affected digits decreased significantly (the score was 2 on the Visual Analogue Scale) (Figure 3).

2. After the next 10 sessions, not only did the patient stop complaining of pain (VAS ≤ 1), but also the middle and ring fingers developed a healthy pink color, while a significant capillary refill was achieved in the small finger.

3. After 8 months (a total of 23 sessions), the patient did not complain of any pain (VAS = 0), while his middle, ring, and little fingers were completely viable with a satisfactory vascular microcirculation (Figures 4, 5).

No local or systemic side effects were observed during the whole period or after the completion of the therapeutic protocol. During the therapy, the patient managed to reduce smoking to about 10 cigarettes/day and was encouraged to continue receiving his vasodilative medication. By the 2-year follow-up visit, the patient has remained free of ulcers and is completely free of symptoms.

**Discussion**

Extensive scientific research has focused on pharmacologic treatment of extremity ulcerations in patients with chronic critical limb ischemia during the last few years. Pharmacotherapy is used as a last resort for improving the manifestations of chronic critical limb ischemia, namely, non-healing ulcerations and gangrene, and for avoiding the serious psychological and social burden inflicted on a patient by 1, or, quite often, more amputations.

Numerous pharmacologic agents have been used in the past for the treatment of chronic critical limb ischemia caused by a variety of diseases that affect the microvascular system of extremities, such as the intravenously administered flavonoid mixture 0-(beta-hydroxyethyl)-rutosides, intravenous regionally administered prostaglandin E1, oral cilostazol. Such agents have dealt rather successfully with chronic critical limb ischemia caused by atherosclerosis, end-stage renal disease, or diabetes mellitus, but their effect on Buerger’s disease (thromboangiitis obliterans) was not evaluated. Fiessinger and Schafer conducted a prospective, randomized, double-blind trial comparing the effects of iloprost (a prostaglandin analogue) with those of aspirin in the treatment of critical limb ischemia of throm-
boangiitis obliterans. The iloprost group had a fairly good response to treatment and only a very small percent required amputation, compared to the aspirin group.

Intravenous regional sympathetic blockade with guanethidine (IRG), first described by Hannington-Kiff, has also been used for the treatment of peripheral vascular disease. Guanethidine is an adrenergic neuron-blocking drug that acts on the peripheral system to inhibit the presynaptic release and subsequent reuptake of norepinephrine from postganglionic sympathetic nerve endings. However, as Olshwang et al demonstrated, patients with Buerger’s disease benefit less from IRG, and the results of IRG treatment are not as good as with other spastic or obstructive vascular diseases. The reason for this might be the comparatively small infusion volume (20 mL for upper extremities, 40 mL for lower extremities) and the short duration of the arterial arrest (10 minutes) they used. In our case, the arterial arrest was maintained for 30 minutes, while the infusion volume was 40 mL, that is, double the infusion volume Olshwang et al used in their study.

As a conclusion, not only was our patient relieved from ischemic rest pain, but also he managed to avoid further disabling amputations. Moreover, the systemic spread of the drugs was prevented by the arterial arrest, and thus the patient did not experience any side effects of guanethidine, namely, postural hypotension, general weakness, and dizziness. The combination of disappearance of all subjective and clinical symptoms together with the absence of side effects of the drugs used lead us to assume that intravenous regional administration of guanethidine and lidocaine might be an effective mode of treatment of Buerger’s disease. The avoidance of disabling amputations, combined with the negative psychological and social burden they impose on patients, make additional research on this topic demanding.

REFERENCES