

Extensive recurrent superficial varicosities following great saphenous vein radiofrequency ablation in a patient with deep venous insufficiency: a case report

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ABSTRACT

Radiofrequency ablation (RFA) is widely accepted as an effective and minimally invasive treatment for superficial venous insufficiency, particularly for the great saphenous vein (GSV). However, its use in patients with concomitant deep venous insufficiency remains controversial due to potential hemodynamic consequences and increased recurrence rates. We present a case of a 54-year-old male with preexisting deep venous insufficiency who underwent RFA of the GSV three years ago and developed extensive recurrent superficial varicosities postoperatively. Despite complete occlusion of the GSV, the patient's symptoms, including leg swelling, nocturnal cramps, and pain, persisted, and varicosities became more diffuse. This case highlights the complex interaction between the superficial and deep venous systems and the importance of individualized treatment planning. A review of the literature is presented, focusing on the indications, contraindications, complications, and alternative treatments for RFA in patients with combined venous disease.

Keywords: Radiofrequency ablation, endovenous laser ablation, deep venous insufficiency, venous hypertension

INTRODUCTION

Chronic venous insufficiency (CVI) is a prevalent vascular condition, affecting approximately 15-25% of the adult population worldwide.¹ It is characterized by valvular incompetence and reflux within the superficial, perforator, or deep venous systems, leading to venous hypertension, edema, pain, and skin changes.² The great saphenous vein (GSV) is the most commonly affected superficial vein, and its reflux contributes significantly to symptomatic varicose veins. Over the past two decades, endovenous thermal ablation techniques—namely radiofrequency ablation (RFA) and endovenous laser ablation (EVLA)—have largely replaced conventional high ligation and stripping due to their minimal invasiveness, lower complication rates, and faster recovery times.³ Nevertheless, in patients with coexisting deep venous insufficiency, the hemodynamic impact of superficial vein ablation is not fully understood, and inappropriate elimination of the GSV can potentially worsen venous return dynamics.⁴ Here, we present a case of extensive recurrent superficial varicosities following RFA of the GSV in a patient with preexisting deep venous insufficiency, and we discuss relevant literature concerning treatment selection, complications, and postoperative management. CEAP SCORE evaluates is C: Clinical, E: Etiologic, A: Anatomic, P: Pathophysiologic parameters.

- **C0:** No visible or palpable signs of venous disease
- **C1:** Telangiectasias or reticular (thin) varicose veins

- **C2:** Varicose veins
- **C3:** Edema
- **C4:** Skin changes
 - » **C4a:** Pigmentation and lipodermatosclerosis
 - » **C4b:** Ectasia/ulceration or fibrotic changes (chronic lymphedema or fibrosis)
- **C5:** Healed venous ulcer
- **C6:** Active venous ulcer

CASE

Recurrent Superficial Varicosities After Surgery

A 54-year-old male, an active smoker with no major comorbidities, presented to the vascular surgery clinic with persistent bilateral leg swelling, pain, and nocturnal cramps. He had undergone RFA of the left GSV three years prior for symptomatic varicose veins. Preoperative duplex ultrasonography at that time had demonstrated reflux (more than 6 seconds) within both the GSV and the deep venous system but there was not any venous ulcer (CEAP 4). Ablation was performed on the superficial component only. The patient worked in a bakery, standing for prolonged hours in front of a hot oven, and had never used compression stockings. His current medications included acetylsalicylic acid 100 mg daily. Follow-up duplex imaging revealed complete obliteration of the right GSV from the saphenofemoral junction to the mid-calf, with no recanalization. However, there was



persistent reflux in the deep venous system, particularly within the femoral and popliteal veins. Numerous dilated tributaries and reticular veins were seen diffusely throughout the thigh and calf, indicating extensive collateral formation. The patient's symptoms remained unchanged compared to the preoperative condition, and new varicose veins developed extensively along the leg. These have become increasingly pronounced, particularly over the last 6 months, leading to discoloration around the veins and increased nocturnal cramps. This suggests a redistribution of venous hypertension rather than a resolution with treatment (**Figure**).



Figure. Diffuse superficial varicosities three years after GSV RFA despite persistent deep venous reflux
GSV: Great saphenous vein, Radiofrequency ablation

DISCUSSION

RFA is a thermal endovenous procedure that delivers controlled heat to induce endothelial destruction and fibrotic occlusion of the targeted vein. Indications include symptomatic saphenous reflux (CEAP class C2–C6) documented on duplex ultrasonography and failure of conservative therapy.⁵ Contraindications include extensive deep venous thrombosis, severe peripheral arterial disease, pregnancy, active infection, or immobility that prevents postprocedural ambulation.⁶ While RFA achieves occlusion rates exceeding 95% at 3 years, recurrent varicosities occur in up to 20–30% of cases, often due to recanalization, incompetent tributaries, or new reflux pathways.⁷ In the present case, recurrence was not due to recanalization but rather redistribution of venous hypertension in the setting of preexisting deep venous insufficiency.

Deep venous insufficiency alters hemodynamics by elevating distal venous pressure and reducing outflow capacity. In such settings, ablation of a compensatory superficial vein like the GSV may eliminate an auxiliary drainage pathway, thereby exacerbating venous hypertension in other superficial channels. This mechanism has been described emphasizing the necessity of duplex-based hemodynamic mapping before

considering RFA in complex venous disease. The absence of compression therapy and the patient's occupational factors—prolonged standing and heat exposure—further contributed to venous dilation and symptom persistence.

Reported complications of RFA include ecchymosis, paresthesia, superficial thrombophlebitis, deep vein thrombosis (DVT), skin burns, and pigmentation changes, though serious events are rare (<2%).⁸ Inappropriate patient selection, however, can lead to paradoxical outcomes, as in this case. The literature describes several mechanisms of post-RFA recurrence: neovascularization at the saphenofemoral junction, development of reflux in accessory saphenous or perforator veins, and compensatory collateral formation secondary to unresolved deep venous hypertension.⁹

Alternative treatments to RFA include EVLA, mechanochemical ablation (MOCA), cyanoacrylate adhesive closure (VenaSeal), and ultrasound-guided foam sclerotherapy (UGFS). These methods vary in thermal injury profile, postprocedural discomfort, and recanalization rates. Randomized controlled trials comparing RFA and EVLA have demonstrated similar long-term occlusion rates, but RFA generally causes less postoperative pain and bruising.¹⁰ Non-thermal, non-tumescent methods such as MOCA and VenaSeal are particularly advantageous in patients with neuropathy or intolerance to tumescent anesthesia.¹¹ Nonetheless, the success of any modality depends on accurate assessment of the underlying hemodynamic disorder.

For patients with concurrent deep venous insufficiency, current guidelines advocate conservative measures such as graduated compression therapy, weight control, and occupational modifications as first-line management.¹²

When intervention is required, combined treatment strategies addressing both superficial and perforator reflux may yield better outcomes than isolated GSV ablation. In advanced cases, venous stenting of the iliac segment or deep vein reconstruction may restore outflow and relieve pressure on the superficial system. Comprehensive postoperative follow-up with duplex imaging is essential to detect early recurrence and guide adjunctive therapy.

CONCLUSION

This case highlights the importance of careful patient selection and hemodynamic evaluation before any ablation procedure, especially in patients with concomitant deep venous insufficiency. The issue is not solely related to RFA. Because venous hypertension is the primary factor in varicose vein formation, and if treatment to address it is not applied, recurrences cannot be avoided. While RFA remains an effective treatment for isolated saphenous reflux, its indiscriminate use in complex venous disease can paradoxically worsen symptoms due to redistribution of venous hypertension. Preoperative duplex mapping, multi-level treatment planning, and consistent postoperative compression therapy are essential to optimize long-term outcomes. Clinicians should maintain a high index of suspicion for recurrent varicose veins and consider this in patients with deep venous pathology and persistent symptoms after successful superficial venous ablation.

ETHICAL DECLARATIONS

Informed Consent

Written informed consent was obtained from the patient included in this report. Signed consent forms are retained by the authors and are available upon request.

Peer Review Process

This report underwent external peer review.

Conflict of Interest

The author declare no conflicts of interest.

Financial Disclosure

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Author Contributions

The author made substantial contributions to the clinical documentation, interpretation, and manuscript preparation. The author approved the final version of the manuscript.

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