

# Intralesional radiofrequency in venous malformations

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## Abstract

Venous malformations are usually asymptomatic and managed conservatively. Treatment, in the form of laser, sclerotherapy, or resection, is needed only if lesions present with symptoms or cosmetic deformity. The aim of this study was to find out how effective radiofrequency ablation was in patients with incomplete or unsatisfactory resolution of a venous malformation after an intralesional injection of bleomycin. During the 5 year period 2008–2012, we organised a prospective, clinical study at a tertiary care centre. Patients were selected from the outpatient department of the Lady Hardinge Medical College and associated hospitals, New Delhi, India.

Five patients with venous malformations were treated by intralesional injection of bleomycin in a dose of 0.5 U/kg body weight, which was repeated every 2 weeks for a total of 8 injections. They then had multiple intralesional radiofrequency ablation every 2 months until a satisfactory outcome was achieved. After the initial 8 doses the reduction in the size of the lesions was minimal (less than 50%). After 2–4 applications of radiofrequency ablation there was appreciable reduction in the size of the lesions (about 80%) with good functional and cosmetic outcomes.

Radiofrequency ablation is an effective adjunct for patients with venous malformations of the head and neck that have not responded satisfactorily to intralesional injection of bleomycin. To our knowledge radiofrequency ablation after intralesional injection of bleomycin has not previously been described as a treatment for venous malformations.

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**Keywords:** Venous malformation; Bleomycin; Radiofrequency

## Introduction

In 1996 the International Society for the Study of Vascular Anomalies adopted Mulliken's nomenclature for congenital vascular lesions.<sup>1</sup> It divided them into 2 categories, haemangiomas and vascular malformations, based on both cellular features and biological behaviour. Vascular malformations

present at birth, do not proliferate or involute, and are further categorised into low-flow (capillary, venous, lymphatic, and combined) and high-flow (arterial and arteriovenous) malformations. Of all vascular malformations, roughly 70% are venous.<sup>2</sup> These are soft, compressible, non-pulsatile masses of variable size, histologically characterised by dilated vascular channels lined with normal endothelium. They can present as isolated skin varicosities or ectasias, localised spongy masses, or as complex lesions that infiltrate various tissue planes such as muscle. Lesions are common in the head and neck, particularly on the lips and cheeks.

Most venous malformations are asymptomatic and can be managed conservatively,<sup>2</sup> but symptomatic lesions and those that cause cosmetic deformities require treatment. Various options are available including laser,<sup>3</sup> sclerotherapy, and resection, but it is usually impossible to excise the lesion

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without complications. Sclerotherapy is therefore the mainstay of treatment. Various agents have been used as sclerosants such as alcohol, iodine, polidocanol, diatrizoate sodium, salicylates, and sodium tetradecyl sulphate, with variable results.<sup>2</sup> Recently, intralesional bleomycin has been used with good results in venous and other vascular malformations.<sup>4</sup>

Here we report 5 cases of venous malformations in which radiofrequency ablation was used. They had already had maximum doses of bleomycin injected into the lesion with no appreciable effect. To our knowledge this is the first description of the use of radiofrequency after injection of bleomycin in the treatment of venous malformations.

### Patients and methods

During the 5 year period 2008–2012, we treated 5 patients with venous malformations with intralesional radiofrequency ablation after maximum doses of bleomycin had been injected into the lesion with little effect. The lesion was diagnosed and its extent assessed clinically. Only patients who did not have a satisfactory outcome after the maximum dose of intralesional bleomycin were included in the study. The outcomes were assessed by all 3 authors independently. The final observations were a mean of the scores of all 3 authors for that particular patient, as described by Pienaar et al.<sup>5</sup>

### Technique

All patients gave informed consent. Bleomycin was injected intralesionally in a dose of 0.5 U/kg body weight, and this was repeated every 2 weeks on a total of 8 occasions. The total cumulative dose was 4 units/kg (maximum 250 U/adult).<sup>6</sup> Those patients who were not satisfied were then treated with radiofrequency ablation every 2 months until the reduction in the size of the lesion was acceptable (Table 1). All the procedures were done under local anaesthesia in the outpatient clinic.

The radiofrequency machine (Surgitron® FFPF Ellman International Inc., New York, USA) settings were at 3.8 MHz frequency, partially rectified mode at 10 W power equipped with an H40 6" needle electrode. The electrode was kept at the site for 10 s so that a total 100 J (10 W × 10 J) of energy was dissipated at that site with applications of the electrode at multiple sites (generally 3–5, depending on the size of the lesion with a 1 cm gap). After completion of treatment the patients were followed up and assessed at 3, 6, and 12 months for recurrence or any other complication.

### Results

After initial treatment with intralesional injections of bleomycin, the overall approximate reduction in the size of the lesion was less than 50%, and after radiofrequency



Fig. 1. Photograph of case 2 before treatment showing venous malformation of the tongue.

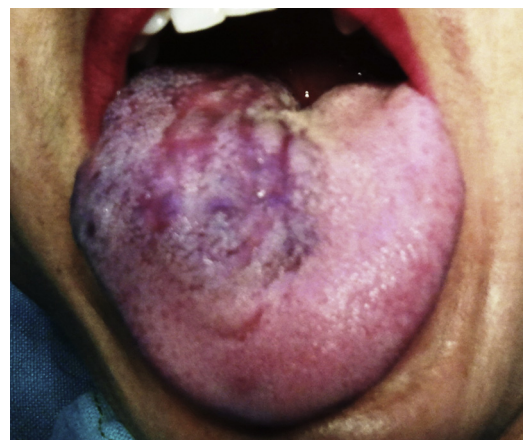


Fig. 2. Photograph of case 2 after intralesional bleomycin followed by radiofrequency ablation.

ablation this increased to about 80%, with good cosmetic and functional outcomes (Figs. 1–4). The only side effect during radiofrequency ablation was minimal pain over the site of the lesion, which subsided within 2–3 days. In particular there was no ulceration, because we inserted the radiofrequency



Fig. 3. Photograph of case 3 before treatment showing venous malformation of the right cheek.

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