# Management of Introral Low-Flow Vascular Malformations By Intralesional Injection of Bleomycin In Paediatric Patient: A Case Report

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**Abstract** Low-flow vascular malformations (LFVMs) in the oral cavity are uncommon but can present significant clinical challenges due to their risk of bleeding, functional impairment, and aesthetic concerns. In this paper we report a case of an 8-year-old child diagnosed with an intraoral LFVM involving the gingiva. The lesion was managed with intralesional injection of Bleomycin (BLM). Significant reduction in size was observed within 6 months of commencing the therapy without any local or systemic complications. BLM is a well established treatment option for peripheral vascular malformations and lymphangiomas, however current case emphasizes its efficacy in intra-oral & gingival lesions, which adds a significant value to current medical literature.

**Keywords:** Low-flow vascular malformation, intraoral, bleomycin, intralesional therapy, paediatric vascular anomalies.

## INTRODUCTION

Mulliken and Glowacki[1] broadly classified vascular anomalies into two groups: vascular malformations (VMs) and haemangiomas. Depending on their flow, these VMs are further divided into high-flow and low-flow VMs (LFVMs). Arteriovenous malformation, arterial malformation, and arteriovenous fistula are examples of high flow malformations. Low-flow malformations include venous, capillary, lymphatic, and combination malformations such as venolymphatic malformations. VMs can appear anywhere on the body but are more prevalent in the cervico-facial region. Such lesions are diagnosed preferably by

FNAC after clinico-radiological evaluation and are primarily treated medicinally by sclerosing agents. During sclerotherapy procedures, ultrasound aids in distinguishing high-flow from low-flow lesions.[2]

Various treatment options for VMs include irradiation, laser therapy, vessel embolization, electrochemical therapy, copper needle treatment, cryotherapy, sclerotherapy, surgical excision and a combination of these.[2,3] Small superficial VMs respond well to laser whereas localized lesions respond better to surgical resection. Sclerotherapy serves as a good alternative for surgical excision with minimal complications and no external scarring.[2] Various authors have discussed the benefits and drawbacks of sclerosing agents ranging from BLM, sodium morrhuate, absolute ethanol, ethibloc, sodium tetradecyl sulphate, OK-432.[3] However, BLM stands out from other sclerosing agents due to its tendency to cause significantly less swelling, pain, skin necrosis, and nerve injury than other sclerosing agents for LFVM.[4,5]

BLM, a cytotoxic antibiotic anti-cancer drug with a sclerosing activity, has demonstrated its efficacy and safety in treating facial VMs. There had been no local or systemic complications.[6]

## CASE REPORT

A male child presented to our hospital with a swelling of size 1.5cmX1.2cm over left lower molar gingiva since 2 months (Fig.1). Routine hemogram and biochemical tests revealed no significant abnormalities. A color doppler ultrasound (Fig.2) showed a relatively well defined heterogenous hypoechoic lesion of approximate size 1.7X1.2cm in submucosal plane with vascularity suggestive of LFVM. Contrast enhanced MRI (Fig.3) reported evidence of heterogenous enhancing altered signal intensity lesion is seen involving left mandibular body region measuring approximately 18X15mm suggestive of VM.

Treatment plan; considering the age (8 years) and propensity of lesion was drawn to medicinal management by sclerotherapy. A written informed consent was taken before sclerotherapy explaining its treatment benefits and potential risks. BLM is available in 15 IU vials. 15 mg powdered BLM dissolved in 15 ml of 0.9% normal saline (1 IU BLM is equivalent to 1 mg/ml BLM). The safe paediatric dose of BLM is 0.5 IU/kg; with maximum dose of 15 IU/session, and at 3 weeks interval. BLM dose was calculated according to weight. Patient weighed 21kg at inception of treatment for which titrated dose was 10.5ml of BLM, given intralesionally under local anesthesia. Manual measures were done to ensure homogenous distribution of drug within the lesion at each session. Relevant observation regarding regression of lesion and local or systemic complications along with baseline parameters were documented. Dexamethasone of 2mg iv was given stat and prophylactic anti-inflammatory syrup paracetamol was administered for 3 days with dose of 100mg twice daily and then SOS. Patient's systemic was observed for 1 hour post injection of BLM, prior to discharge.

Observations were made at frequency of 3 weeks interpreted as the session of BLM injections and were recorded for unbiased evaluation based on a 4-point scale that was modified by Achauer[7] et al. and Hassan et al.[8] This scale took volume, colour and texture of the lesion after treatment into consideration.

| | |
|---|---|
| **1. No response** | no change in the size or continued to enlarge |
| **2. Mild improvement** | the lesions decreased in size, but <50% with improvement in appearance |
| **3. Marked improvement** | the lesions decreased in size more than 51%, but <100% with remarkable improvement in appearance |
| **4. Cured** | the lesions disappeared completely without recurrence at least 6 months after treatment. |

In this case, there was marked improvement at 6 month follow-up. Patient was followed up for a period of 8-12 months with lesion stunted to 0.2X0.2cm (Fig.4)

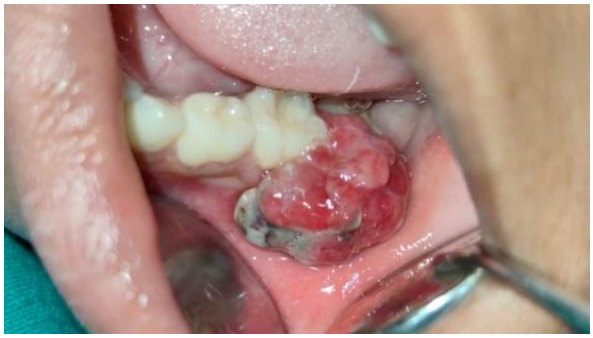

**Fig.1 Pre-Op Image**

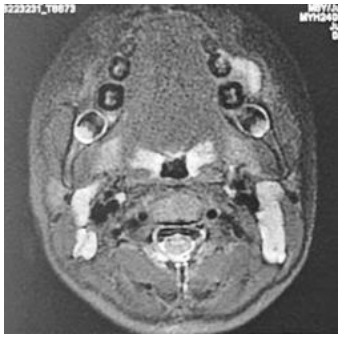

**Fig.3 – Contrast Enhanced MRI**

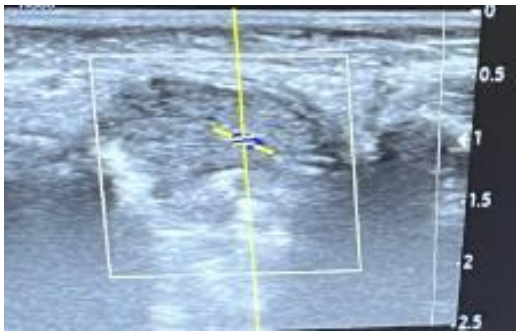


**Fig.2 - Color Doppler USG**

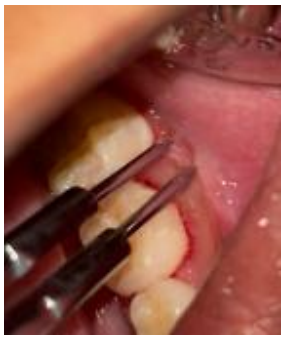

**Fig.4 – 8 Month Follow-Up**

## DISCUSSION

Sclerotherapy is a minimally invasive and successful treatment option for VMs.[9] BLM, an antitumor drug discovered in 1966, inhibits DNA synthesis and also affects vascular endothelium through its sclerosing properties. BLM disrupts cell proliferation by cutting the deoxyribonucleic acid (DNA) chain during the S stage of the cell cycle.[2]

In terms of BLM safety, during the follow-up period, there were no clinical symptoms of pulmonary fibrosis, such as central cyanosis, dyspnea or tachypnea, attributed to closely adhering to paediatric safe dosage at 3-week intervals. This is in-line with Ionescu et al.[10], who verified that, in contrast to intravenous BLM used in chemotherapy, there was no detectable BLM in blood samples obtained from pediatric patients 24 hours following BLM intralesional injections, which also is observed in our study. It is recommended that BLM timing of injections and doses should be documented in medical records, and parents were instructed to inform the anesthesiologist that their child received BLM, prior to any subsequent surgical procedure. Patients who have received BLM injections within the last 12 months should not receive high concentrations of oxygen in GA because BLM increases lung's sensitivity to oxygen, which can lead to BLM-induced lung toxicity and respiratory failure,[6] however this was not required in our subject.

## CONCLUSION

VMs are one of the rare entities when compared with pathological hamartomas of head and neck regions; therefore guidelined protocol for such entities poses a challenge to every maxillofacial surgeon. LFVM in our case occurred in gingiva which is one of the rare sites at an age of 8 years, such a pathology can lead to devastating accidents of haemorrhage costing patient's life. Literature has discussed various modalities of treating it, nevertheless, non invasive to invasive approach is the ladder followed by most. Intralesional injections were first discussed in 1951;[13] and thereafter various agents have been extensively studied, and are now accepted modality

of treating VMs and LFVMs particularly in the cervico-facial region.[6] BLM has been used in our study due to its higher efficacy than other drugs. We observed that scientifically titred dose of BLM, is an effective method of treating LFVM in gingival region, yet we advocate of such scientific studies to be conducted in larger sample size in a multimodal fashion to validate our conclusions.

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