

Management of arteriovenous (AV) malformation of the left lateral border of tongue with sclerotherapy: A case report

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Abstract

Arteriovenous (AV) malformations are rare but clinically significant vascular anomalies that can affect the oral cavity, particularly the tongue. They present with pain, swelling, and risk of haemorrhage, and require prompt diagnosis and appropriate management. Sclerotherapy, using intralesional injection of sclerosing agents, is a well-established, minimally invasive treatment for vascular malformations of the oral cavity. This case report presents the successful management of an AV malformation involving the left lateral border of the tongue in a 38-year-old female patient through sclerotherapy performed under local anesthesia. The patient reported complete symptom resolution post-procedure, demonstrating the efficacy and safety of sclerotherapy as a primary treatment modality for lingual AV malformations.

Keywords: AV malformation, tongue, sclerotherapy, vascular malformation, oral cavity, local anesthesia

Introduction

Vascular malformations of the oral cavity represent a diverse group of congenital or acquired lesions arising from abnormal vascular development [1]. Among these, arteriovenous (AV) malformations are high-flow lesions characterized by direct shunting of blood from arteries to veins without an intervening capillary bed. Unlike hemangiomas, which are true vascular tumors with endothelial cell proliferation, vascular malformations are non-neoplastic structural anomalies that grow proportionately with the patient and do not undergo spontaneous involution [2].

The tongue is a particularly challenging site for vascular malformations due to its rich vascular supply, high mobility, and critical functional roles in speech, mastication, and deglutition. Lingual AV malformations may present with pain, swelling, bleeding upon minimal trauma, and difficulty in swallowing or speaking. Left untreated, they carry the risk of progressive enlargement and life-threatening haemorrhage [3].

Treatment options for oral vascular malformations include surgical excision, laser therapy, cryotherapy, embolization, and sclerotherapy [2]. Sclerotherapy — the intralesional injection of a sclerosing agent — has emerged as a preferred first-line treatment due to its minimally invasive nature, cost-effectiveness, and favorable outcomes. This report presents a case of AV malformation of the left lateral border of the tongue managed successfully with sclerotherapy under local anesthesia.

Case report

Methods

1. Patient Presentation and Diagnosis

A 38-year-old female patient, from Udaipur, Rajasthan, presented to our outpatient department with a chief complaint of pain along the left lateral border of the tongue persisting for 2 to 3 weeks. The patient had no significant past medical or personal history (NRH). She denied any history of trauma, bleeding episodes, or previous treatment for the lesion.

Clinical examination revealed a vascular lesion on the left lateral border of the tongue measuring approximately 1.5cm×1cm, consistent with an AV malformation. The lesion appeared bluish-red, soft, and compressible on palpation. A provisional diagnosis of AV malformation involving the left lateral border of the tongue was established based on clinical findings. Further diagnostic evaluation, including color Doppler ultrasound, was recommended to confirm internal vascular architecture and flow characteristics



Pre operative lesion site

2. Treatment Planning

After clinical diagnosis and evaluation, sclerotherapy was selected as the treatment modality, considering the lesion's size, anatomical location, and the minimally invasive nature of the procedure. The risks and benefits of alternative approaches — including surgical excision and laser therapy — were discussed, and sclerotherapy was deemed the most appropriate first-line intervention given its favorable safety profile and effectiveness for lingual vascular lesions.

3. Sclerotherapy Procedure

Sclerotherapy was performed under local anesthesia (LA). The operative site was prepared and surface anesthesia was achieved. A sclerosing agent sodium tetradecyl sulfate 3%

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NCCT & CECT SCAN OF NECK WITH ANGIOGRAPHY

Pre & post contrast axial sections taken from skull base up to aortic arch level.
 CT angiography has been performed by injecting IV iso-osmotic contrast after intravenous injection of omniomic contrast. Retrospective reconstruction and curved PRV format has been performed

Imaging features :

There is a well defined oval shaped isodense lesion measuring about 9x17 mm seen at the left lateral border of tongue. It shows delayed homogeneous post contrast enhancement. No obvious feeding artery or draining vein is seen- These findings are suggestive of slow flow vascular malformation/hemangioma.

There are few subcentimeter sized bilateral level Ib and II lymph nodes are seen - most likely reactive etiology.

There is normal conventional arch anatomy. The origins of common carotid and vertebral arteries are unremarkable.

Bilateral common carotid and cervical internal carotid arteries appear normal. Bilateral vertebral arteries are normal in course and caliber.

Nasopharynx and hypopharynx are normal.

Larynx is normal.

Bilateral submandibular and parotid gland are normal.

No evidence of cervical lymphadenopathy.

Thyroid gland is normal.

Trachea and visualized portion of esophagus are normal.

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The patient tolerated the procedure well under local anesthesia with no significant intraoperative complications. In the immediate postoperative period, mild pain and localized inflammatory reaction were noted at the injection site, which were managed with analgesics, anti-inflammatory medications, and antibiotics as required. Intraoperative images (Pre-Op, Intra-Op, Post-Op) documented the clinical appearance and treatment progress of the AV malformation. Pre-operative assessment confirmed the presence of a well-defined vascular lesion on the left lateral tongue border. Intraoperative views captured the sclerosing agent delivery and manual compression. Post-operative images demonstrated visible reduction in lesion

size and change in color, indicating early therapeutic response.

On follow-up, the patient reported significant relief from pain and discomfort, with clinical examination confirming regression of the vascular lesion. No recurrence or major adverse effects were noted at the follow-up visit, indicating a successful therapeutic outcome.

Discussion

Arteriovenous malformations (AVMs) of the tongue are rare, high-flow vascular anomalies that pose significant therapeutic challenges due to their rich vascularity and functional importance. These lesions are congenital in origin, persist throughout life, and typically present as compressible, bluish masses associated with pain, bleeding, and functional impairment [3]. The present case demonstrated similar clinical characteristics, emphasizing the importance of accurate diagnosis and timely intervention.

Management of lingual vascular malformations remains complex, with traditional surgical approaches associated with risks such as hemorrhage, recurrence, and functional deficits [2]. Consequently, minimally invasive modalities like sclerotherapy have gained prominence as first-line treatment options. Sclerotherapy induces endothelial damage, thrombosis, and fibrosis, leading to regression of the lesion [3]. Sodium tetradecyl sulfate (STS) is widely used due to its efficacy in producing vascular obliteration and lesion shrinkage [4].

Clinical studies have demonstrated favorable outcomes with STS, showing significant lesion reduction and minimal complications such as transient pain and edema [5]. In the present case, similar results were observed, with effective lesion regression and no major adverse effects. The peripheral-to-central injection technique further enhances treatment efficacy by ensuring controlled distribution of the sclerosant [6].

Thus, sclerotherapy represents a safe, effective, and minimally invasive approach for managing lingual AVMs, with the added advantages of functional preservation and reduced morbidity.

Conclusion

This case report demonstrates the successful management of an AV malformation of the left lateral border of the tongue using sclerotherapy under local anesthesia. The patient, a 38-year-old female presenting with pain and a vascular lesion of 2 to 3 weeks duration, showed satisfactory clinical response to the procedure with regression of the lesion and resolution of symptoms on follow-up.

Sclerotherapy remains a highly effective, non-invasive, and cost-efficient treatment for lingual vascular malformations. It offers significant advantages over surgical alternatives in terms of functional preservation, patient tolerance, and clinical outcomes. Clinicians managing oral vascular anomalies should consider sclerotherapy as a first-line option, particularly for lesions in anatomically sensitive locations such as the tongue.

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