



Utility of Sodium Tetradecyl Sulphate for the Management of Oral Venous Malformation

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Abstract

Venous malformation are one of the most common lesions of oral cavity. The lesion may be congenital malformation in neonates or arteriovenous malformation in adults. Various surgical and medical managements are possible for vascular lesions which includes surgical excision, laser therapy, cryotherapy, selective embolization, intralesional sclerosing agents, beta blocker and steroid therapy. In this current study we assessed the efficacy of intra lesioned injection of sclerosing agent i.e. 3% sodium tetra decyl sulphate in oral lesions of venous malformation. Sclerotherapy with 3% sodium tetra decyl sulphate is an effective agent in treating benign oral lesion of vascular malformation and provides alternatives to surgical method.

Keywords: Venous Malformation; Sodium Tetradecyl Sulphate; Hemangioma

Introduction

Hemangioma and vascular malformation are common benign lesions of vessel that often occur in cervical regions. The comprehensive term "hemangioma" was classified into two i.e. hemangioma and vascular malformation by Mulliken and Glowacki in 1982 [1]. Vascular malformation is a generalized term used to describe a group of lesions, present at birth, formed by an anomaly of angiovascular or lymphovascular structures. vascular malformation occur in approximately 1% of births but majority of patients do not present for treatment [2]. The high-flow vascular anomalies in the head neck are arteriovenous malformation [3].

Neville modified the classification of vascular malformation as [4]:

- Simple (capillary, venous, lymphatic, arteriovenous)
- Combination of two or more.

Vascular malformation also classified as [5,6]:

- Low flow (capillary, venous, lymphatic malformation or a combination of them)
- High flow (arterial and arteriovenous shunt).

Vascular malformations (VM) are characterized by thin non-proliferating endothelial wall surrounded by a thin smooth muscle layer. These lesions normally don't involute, but continue to increase in size in proportion with body size, often reaching enormous volumes [7].

There is no standard treatment protocol for the management of VM. Treatment options of low flow VM include simple observation, minimally invasive interventions such as sclerotherapy [8] or embolization, cryotherapy, laser ablation, and for more aggressive surgical resection.

Sclerotherapy is an option for the management of vascular malformation due to its safety, ease of administration, acceptable aesthetic and functional outcomes. sodium tetra decyl sulphate has been widely used as a sclerosing agent since 1946. The mechanism of action of sodium tetra decyl sulphate is to produce endothelial damage with minimum thrombus formation leading to fibrosis of lesion [9]. In our study, we used sodium tetra decyl sulphate for the treatment of venous malformation of oral region.

Patients and Methods

This study was conducted on 10 patients (ASAI) who were diagnosed as venous malformation for sclerotherapy with sodium tetradecyl sulphate from July 2018 to July 2019 in the department of oral and maxillofacial surgery, Buddha Institute of Dental Sciences and Hospital, Patna.

Informed consent was taken from all the patients of either sex who were included in the study. The following parameters were recorded: age, sex, chief complaint, size (largest diameter in cm), location of the lesion. All patients venous malformation were treated by permucosal sclerotherapy with 3% STS solution.

The number of sclerotherapy injections and post-treatment responses, assessed by clinical examination, were recorded. Each patient received an intralesional injection of STS 3% solution under aseptic technique and without local or general anesthesia.

The 3% Sotradecol solution was injected into each lesion using an insulin syringe. After introducing the needle, the plunger was withdrawn to look for backflow of blood and to confirm appropriate entry of the needle into the center of the vascular space.

The sclerosing agent was then injected until the lesion blanched. Larger lesions were treated by multiple injections. A minimum of

0.5 - 2 ml of the agent was injected into each lesion (at a ratio of 0.5 ml for each 2 cm of lesion size) or a quarter the lesion volume [10].

A compression dressing was applied for at least 2h post injection. All the patients received an oral analgesic and a single postoperative dose of intramuscular (gluteal) injection of dexamethasone (8 mg) to decrease the inflammation and pain post injection. Follow up of each patient was scheduled every 2 weeks and therapy was repeated after 4 weeks if there was no response or only a partial response. Follow up was scheduled every 2 weeks till 6 months.

The response to the treatment was graded as follows:

- No response: No change in size after injection),
- Mild response: 25% decrease in the size after injection),
- Moderate response: 50% decrease in size after injection),
- Good response: 75% decrease in size after injection) and
- Complete response of the lesion: 100% shrinkage of the lesion.

Result

Total of 10 patients were (6 females and 4 males) enrolled, mean age 30.60 years \pm SD 9.9116 age range between 21 yrs to 52 yrs. The lesion involved the following locations buccal mucosa/labial mucosa (n = 6), lower alveolus (n = 1) tongue (n = 3). The chief complaint was mostly painless swelling in the oral cavity.

No prior therapeutic interventions were recorded except in one patient who reported with biopsy report as capillary hemangioma. The size of the lesion ranged from 1.5 x 1.5 cms to 5.0 x 4.0 cms in its widest diameter with an average size of 6.70 cms.

The number of injection of 3% sodium tetradecyl sulphate per lesion ranged from one to two at definite interval (average 1.30) of dose of 0.5 - 2.0 ml per injection, according to maximum recommended dose of 0.5 ml/kg of body weight.

Among the 10 patients, the responses to treatment were complete response in 9 patients (90%), good responses in 1 patient (10%).

No hypersensitivity reactions were reported in any patients. The complication encountered in all the patients like pain, edema in 3 patients, burning sensation in 1 patient, ulcer in 2 patients.

S.no	Age/sex	Site	Size of lesion (approx. in cms)	No. of session	Respond to sodium tetradecyl sulphate	Complication
1	52/F	Lower alveolus	1.5 X1.5	1	Completely resolved	Pain
2	26/M	Lower labial mucosa with gingiva	2.0 X2.0	1	Completely resolved	Pain, edema, burning sensation
3	41/M	Upper Labial Mucosa	2.5 X 2.5	1	Completely resolved	Pain
4	22/F	Right buccal mucosa	3.0 X 3.0	2	Completely resolved	Pain
5	35/F	Left buccal mucosa	3.0 X 3.0	2	Good	Pain
6	38/F	Left lower border of tongue	2.5 X 2.5	1	Completely resolved	Pain, edema, ulcer
7	21/M	Lower labial mucosa	1.5 X 1.5	1	Completely resolved	Pain
8	25/M	Upper labial mucosa	2.0 X 2.0	1	Completely resolved	Pain, edema, ulcer
9	21/F	Right lateral border of tongue	5.0 X 4.0	2	Good	Pain
10	25/F	Right lateral border of tongue	2.0 X 2.0	1	Completely resolved	Pain
Mean	30.600		6.7000	1.3000		
±SD	9.9116		4.9934	0.4582		

Table 1

Discussion

Management of Venous malformation is dependent on size, location, and often surgeon preference and comfort. Small venous malformation can be completely excised. However, complete surgical eradication of extensive oral or facial venous malformation is rarely possible without jeopardizing function or causing additional disfigurement [11] and/or severe haemorrhage [12].

Treatment options for small and peripheral vascular lesions are conventional surgical excision, laser therapy, cryotherapy, selective embolization, sclerotherapy and medical treatment using beta blocker or steroid.

When the lesions are larger and deeper, embolization or obliteration to adjacent vessel is required. These treatments lead to irreversible tissue injury and gradual fibrosis.

Surgical resection should be performed to prevent recurrence. However, surgical resection is limited when complete resection is not possible, when it may cause critical bleeding problem or when crucial organs can be injured. Extensive surgery in the oral cavity can induce a problem of chewing or swallowing.

Sclerotherapy is a safe and effective treatment for lesions that are small or located where esthetical conservation is required, sclerotherapy can be an alternative to surgical treatment [13].

There are many other agents used for sclerotherapy: sodium morrhuate, bleomycin, ethanolamine oleate, ethanol, hypertonic saline, and various combinations of these medications [14]. The most common side effects were skin necrosis and ulceration, hypersensitivity, and swelling.

According to study of Stimpson., *et al.* [15] used 3% sodium tetradecyl sulphate to treat 12 patients who had Venous malformation in the head and neck. They found that a single treatment may be adequate for small lesions, but the injections may be safely repeated until a satisfactory result is obtained in large lesions. Overall success rate was 68%.

The similar result was obtained in our study of 10 patients of venous malformation, in 9 patients the lesion resolved completely, in 1 patient the lesion resolved 75%. The small lesion, in 7 patients resolved in single injection, 3 patients had lesion more than 2 cms but less than 5 cms required 2 sessions of 3% sodium tetradecyl sulphate.

Follow up was scheduled every 2 weeks and repeated injections were scheduled after 4 weeks in those patients with unsatisfactory results. three of the patients in this series had two repeated injections, because of the size of lesion that was more than 2 cms but less than 5 cms, as similar study of Stimpson., *et al* [15].

Study of Bajpai, *et al.* (2012) used 3% Sodium tetra decyl sulphate in 8 patients of follow up period was 2 - 3 years comparative Success rate of the study was 62.5%. In my study the overall success rate was 70%, that was similar to the study of Bajpai, *et al.*

In one case (Case 2) that was previously diagnosed as pyogenic granuloma on the basis of clinical appearance but after histopathological evaluation confirmed as capillary hemangioma, was treated with 3% sodium tetra decyl sulphate and the lesion resolved about to 75% in single session of injection.

In the current study, the side effects were mild in nature and healed spontaneously. In this case series, no serious complications occurred such facial nerve palsy [14] and blindness [8] which have been reported by others.

Post injection inflammatory reactions and pain were recorded in all patients. Two patient developed a small ulceration at the injection site. Soft-tissue swelling generally increases in the region of the malformation immediately after the injections. Subsequently, necrosis and inflammation induced by the sclerosis subsides with fibrous tissue formation, culminating in progressive reduction in the lesion size. The complete clinical effect of the therapy may not be evident for several months. Patients and their families must be informed about these expected side effects and outcomes so the patient has realistic expectations.

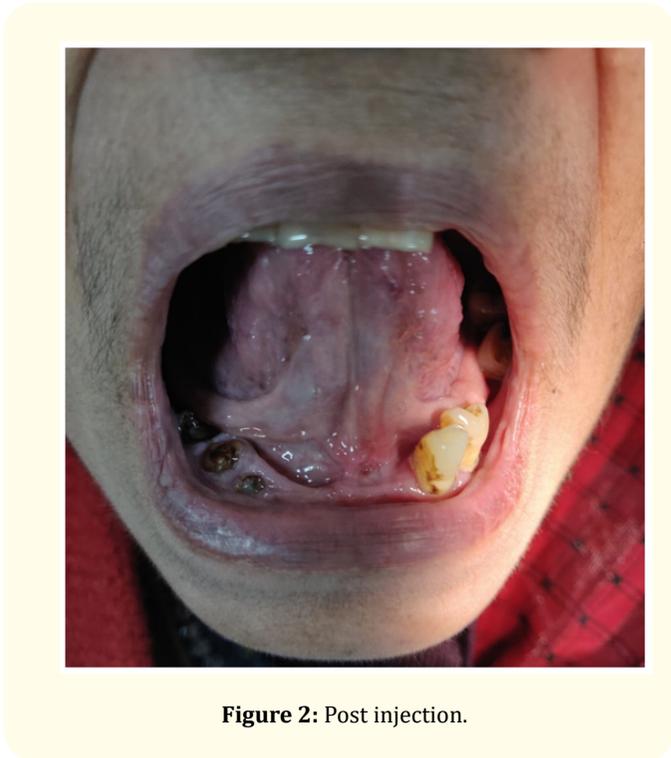


Figure 2: Post injection.

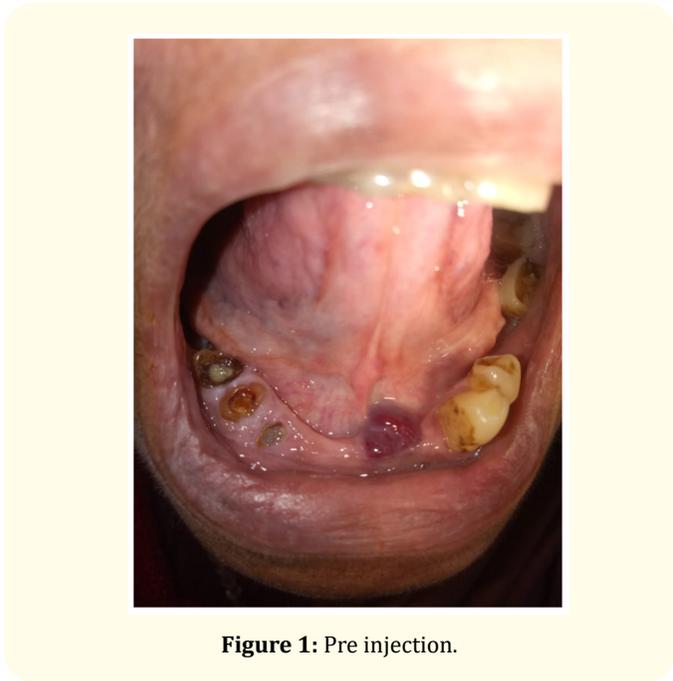


Figure 1: Pre injection.



Figure 3: Pre injection.



Figure 4: Post injection.

Conclusion

Sclerotherapy with direct intralesional injection of 3% Sodium tetradecyl sulphate solution is simple, safe, and effective therapy for managing head and neck Venous malformation. Smaller lesions have a more favorable result. Further controlled studies need to be performed to determine the overall efficacy of STS in the management of Venous malformation of the head and neck, as well as long term follow-up to observe results.

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