

Analysis of Outcomes of Subcutaneous Vascular Anomalies

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ABSTRACT

Background: Arteriovenous malformations (AVMs) diagnosis and treatment remains challenging because of their variability in presentation and it's high recurrence rate. Specifically rare sites and presentations makes it more difficult to manage these disorders. Usually a multidisciplinary team is needed for the management as per present recommendations and which includes a good diagnosis by a radiologist which may improve the management and outcomes . The purpose of this study is to discuss and review some arteriovenous malformations and their treatment modalities which are performed in our department.

Results: A total of 64 subcutaneous arteriovenous malformations patients were studied. Out of 64 patients 43 were slow flow vascular malformations and 19 were high flow vascular malformations and rest 2 were lymphaticovenous malformations. All AVM's were treated with sclerotherapy, surgical excision, or laser ablation method . Out of 64 ,43 patients required multiple sittings of sclerotherapy 15 patients underwent excision followed sclerotherapy and 19 patients underwent ligation of feeder vessels and excision directly and 6 patients has recurrence and 2 patients underwent laser ablations and required minimum of 2 sittings without recurrence complications . Very limited data is available for their management of AVM's so this article discuss the various modalities of their treatment and their efficacy for the same.

Conclusion: Sclerotherapy followed by surgical excision has good outcomes both surgically and aesthetically than excision and ligation of feeder vessels alone in terms of recurrence and complications. We had good outcome in these vascular malformations as compared to

sclerotherapy alone or other modalities which has been tried earlier with high failure rates.

I. INTRODUCTION:

Subcutaneous vascular malformations are one of the most notorious diseases as these are difficult to diagnose and hence their management is usually delayed due to late diagnosis. Their presentation may vary from simple swelling which is progressively increasing with age to a life-threatening congestive heart failure. It's management varies from simple medical management to complex surgeries for functional and cosmetic problem even with these options there is high chances of recurrence which requires repeated or multiple interventions. For a slow flow vascular malformations simple percutaneous sclerotherapy with various recommended sclerosing agents give satisfactory outcomes.

Here in our study we have described the current approach and outcomes which are being used in our institute with their effectiveness.

Definition of vascular anomalies includes a congenital lesion as a result of abnormal vascular development, includes the wide variety of malformations which can range in severity from minor disfigurement to major disability depending upon the size, site, type and number of malformations [1-9]. Classification system given by Mulliken and Glowacki [10] and International Society for the Study of Vascular Anomalies are most widely accepted globally [11]. According to these classifications vascular anomalies are broadly divided into vascular tumours and vascular malformations, which is based on their presentations, histopathological, endothelial cell characteristics.

Any part of the body can be included in vascular anomalies. Subcutaneous tissue and

muscles can be involved in arteriovenous malformation[7]. Most of the lesions are benign and composed of vascular tissues that can lead to various complications such as bleeding which can be life threatening, ulceration and infection [10–14]. Due to advancing research in the medical field management of vascular anomalies is also developing and new and advanced options are available which includes a multidisciplinary approach which includes plastic surgeon, interventional radiologist, paediatric surgeon, otorhinolaryngologist and paediatric oncologist [11–14]. Various modality of treatment includes conservative treatment, surgical excision, injection sclerotherapy, cryotherapy, laser treatment, angiographic embolization, angioplasty/ligation of feeder vessels, use of angiogenesis inhibitor drugs such as corticosteroids these are available easily and gives good results [6, 12, 15, 16].

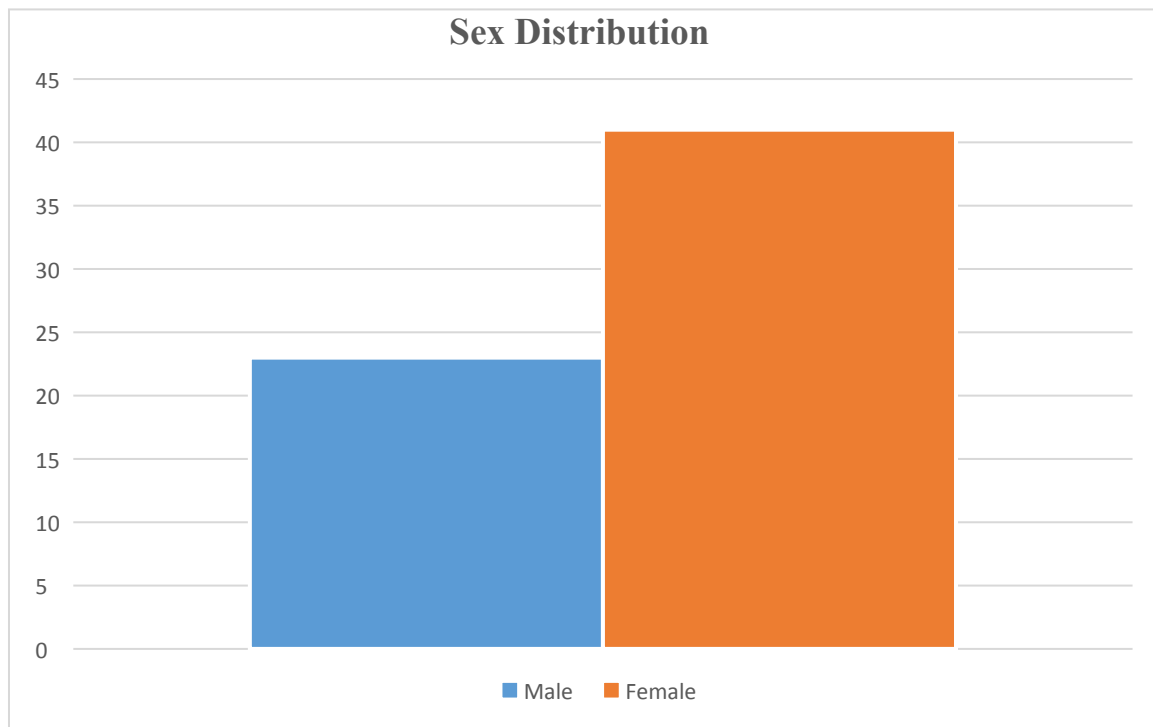
II. METHODOLOGY:

Records of all the patients who underwent treatment for Vascular Malformations in the department of Plastic Surgery, Gandhi Medical College Bhopal from January 2022 to December 2024 were included in the study and results were studied in terms of the patient's age at presentation, most commonly affected sex, commonly affected anatomical site, type and size of the lesion, and further what treatment was offered and their outcomes.

The diagnosis of vascular anomalies was made based on clinical examination and characteristics on imaging. Diagnosis was made by Doppler ultrasound. In view of the lack of adequate facilities required for cryotherapy, angiographic embolization in our institute patients underwent intraliesional sclerotherapy, laser ablation or ligation of feeder vessels followed by excision with primary closure.

III. RESULTS:

Total of 64 patients had come to the department of plastic surgery from January 2022 to December 2024. Out of 64 patients 23 were male and 41 patients were female



Out of 64 patients 43 patients were of slow flow vascular malformations, 19 patients were of high flow vascular malformations and 2 patients were of lymphaticovenous malformation Out of 64 maximum that is 40 patients had lesions in head and neck region that includes face, cheek, palate, orbit, maxilla, scalp and accounts for 62.5% of total cases followed by upper limbs 18.75%, lower limbs 12.5%, and trunk 6.25% (Table 1)

Table 1 Anatomical site involved

Anatomical sites	Frequency	Percentages
Head and neck	40	62.5%
Upper limbs	12	18.75%
Lower limbs	8	12.5%
Trunk	4	6.25%

Out of 64 patients all slow flow vascular malformation patients underwent sclerotherapy with sodium tetradecylsulphate that is 43 patients out of which 28 underwent sclerotherapy alone and 15 had excision followed by sclerotherapy, all the high flow vascular malformations directly underwent ligation of feeder vessel and excision 2 lymphaticovenous malformation underwent laser ablation (Table 2)

Table 2 Distribution of procedures performed (N = 64)

Procedure performed	Frequency	Percentages
Sclerotherapy	28	43.75%
Excision followed by Sclerotherapy	15	23.43%
Excision followed by ligating the feeder vessels	19	29.68%
Laser ablation	2	3.12%

Out of all 64 patients 3 patients who underwent surgical excision had surgical site infection but were managed with regular dressings and antibiotic coverage according to culture sensitivity but patient who underwent surgical excision had lower recurrence and required less number of sittings. Recurrence was high with sclerotherapy alone which lead to ulceration and bleeding on repeated sittings which further lead to formation of ugly scar . Laser ablation required multiple sittings but yielded good results in terms of scar and recurrence in lymphatic malformations . (Table 3)

Table 3 Distribution of postoperative complications (N = 64)

Procedure performed	Frequency	Percentages
Surgical site infection	3	4.68%
Repeated sittings	40	62.5%
Recurrence	15	23.43%
Ugly scar	4	6.25%

V. DISCUSSION:

In resource limited setup the diagnosis and management of vascular anomalies is challenges for the surgeons [17]. In our study a retrospective analysis was done and following are the findings ,the median age of patients at presentation was 6 years which is comparable with that reported by Osifo and Evbuomwan in Nigeria[18]. In our study we found that females were more affected than males with a ratio of 1.7:1. This is in congruence with other studies which also reported female predominance [19, 20], but it is different from Osifo and Evbuomwan [18] in Nigeria who reported that males were more affected as compared to females. Exact reason for this differences is unclear and needs further research .Diagnosis of vascular anomalies can be made by history and clinical examination (such as site, size, color, surface, and tactile qualities in majority cases) [20, 21].Least invasive and cost effective modality of diagnosing a vascular anomalies is Doppler ultrasound . In our patients also all the patients underwent atleast color Doppler before going for definitive procedure and all the patients in our study with slow flow vascular

IV.

malformations underwent sclerotherapy and out of which 15 patients also had surgical debulking following the sclerotherapy these patients had no recurrence and had better scars as patients were more satisfied in terms of aesthetics , patients with high flow vascular malformation also had good results but had complications like surgical site infections and 2 patients had recurrence whereas 13 patients who underwent sclerotherapy alone had recurrence with unsatisfied patient in terms of scars and aesthetics.

VI. CONCLUSION:

Vascular anomalies are one of the most difficult tumors to treat because of major diagnostic and therapeutic challenges . These are most commonly seen in infants and children these can be congenital or acquired. Making the correct diagnosis is of foremost importance for planning treatment. Selecting a correct mode of treatment to reduce the complications is also of utmost importance in our study we conclude that sclerotherapy followed by debulking in slow flow vascular malformations and surgical excision by ligating feeder vessels provides good results in high flow malformations. In our study we have not done

embolization as the facility is not available in our institute for high flow malformations and also laser ablation for lymphaticovenous malformation requires further studies as we had only 2 patients for the same.

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