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### RESEARCH ARTICLE

#### A CLINICAL STUDY OF VASCULAR ANOMALIES AND THEIR MANAGEMENT IN A TERTIARY CARE CENTER IN TELANGANA

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#### Manuscript Info

##### Manuscript History

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#### Abstract

**Aim & Objectives Of The Study Aim Of The Study:** The aim of this study is to analyze the various modalities of treatment for vascular anomalies and their response at a Tertiary care centre in Telangana.

**Objectives Of The Study:** 1. To study the incidence of various vascular anomalies. 2. To study the demographic features of various vascular anomalies. 3. To study the various modalities of treatment used at Tertiary care center 4. To study the complications.

**Need For The Study:** Vascular anomalies signify a deviation from normal vasculature. Their morbidity can range from mild discoloration of skin to massive involvement leading to functional compromise. These anomalies include a group of disorders which are difficult to classify as well as to treat. They are commonly misdiagnosed and hence mistreated. Hence, correct diagnosis which is of paramount importance for the proper management of vascular anomalies is done by proper history and clinical examination and proper investigations like color Doppler study and if needed Angiogram. These lesions can cause cosmetic deformities of the head and neck and can interfere with the normal function in these areas. Hence, early diagnosis with clinical evaluation and investigations like Color doppler study and if needed angiogram and treatment needs to be done to avoid dangerous complications associated with these lesions such as bleeding, cosmetic deformity, airway obstruction which might even cause death of the individual.

**Materials & Methods Study Design:** Retrospective clinical study  
 Study subjects: All patients admitted in the Department of Plastic and Reconstructive surgery with vascular anomalies within the stipulated time period of 48 months ( 2 years retrospective and 2 years prospective from February 2021 to March 2025) are included in the study  
 Sample size: All patients with vascular anomalies attending the OPD of Department of Plastic and Reconstructive Surgery within the stipulated time period is included in the study with minimum sample size taken as 20  
 Inclusion Criteria: All patients with vascular anomalies admitted in the Department of Burns Plastic And Reconstructive Surgery willing to participate are included in the study.

**Exclusion criteria:** 1. Patients not willing to participate in the study. 2. Patients who are unfit for anesthesia. 3. Patients with CNS AV

malformation Period of study: 48 Months (2 years Retrospective and 2 years Prospective).

**Place of study:** Osmania General Hospital, Hyderabad.

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## **Introduction:-**

Vascular anomalies include a spectrum of disorders including vascular tumors and vascular malformations.

Vascular anomalies were first classified by Mulliken and Glowacki in 1982 which was based on the biological activity of the tumor and helped in understanding and classifying vascular malformations[1]. Before that hemangiomas were often called cherry angioma, strawberry angioma or cavernous angioma.

According to molecular studies vascular anomalies are caused by dysfunctional signalling processes that regulate proliferation, apoptosis, differentiation, maturation and adhesion of vascular cells[2].

A hemangioma is an abnormal proliferation of blood vessels occurring in any vascularized tissue[2]. There seems to be consensus that the term "hemangioma" should refer to "hemangiomas of infancy," which have a predictable natural history that includes absence at birth followed by a period of growth over 6-18 months and then a period of involution that may take several years.

Hemangiomas are the most common cutaneous tumor of infancy and demonstrate rapid growth followed by a low spontaneous involution or resolution in 5-7 years.

Vascular malformations on the other hand enlarge with the growth of the child and do not undergo spontaneous involution.

Vascular malformations are caused by the disturbance in the late stages of angiogenesis and result in persistence of arteriovenous anastomosis present during embryonic life[3]. They may be capillary, lymphatic, venous, arterial or mixed[3].

Vascular malformations have been recognized throughout history as birthmarks. In 1866, Dugas conducted a scientific analysis of birthmarks and concluded that they were caused by defects in embryonic development[2]. Virchow and Wagner established the first classification system of vascular malformations, based on channel, architecture and histomorphologic appearance[2].

## **Aims & Objectives:-**

A clinical study of vascular anomalies and their management in a tertiary care center in Telangana.

## **Objectives:-**

1. To study the demographic features of various vascular anomalies
2. To study the various complications associated with these anomalies and the various modalities of treatment used in a tertiary care center in Telangana.

## **Materials And Methods:-**

1. Clinical Study
2. Our study included all the patients admitted in the Department of Plastic & Reconstructive Surgery with vascular anomalies within the stipulated time period of 48 months ( May 2022-May2024).
3. Study duration: 2 years
4. Place of Study: Osmania General Hospital, Hyderabad

## **Inclusion Criteria:**

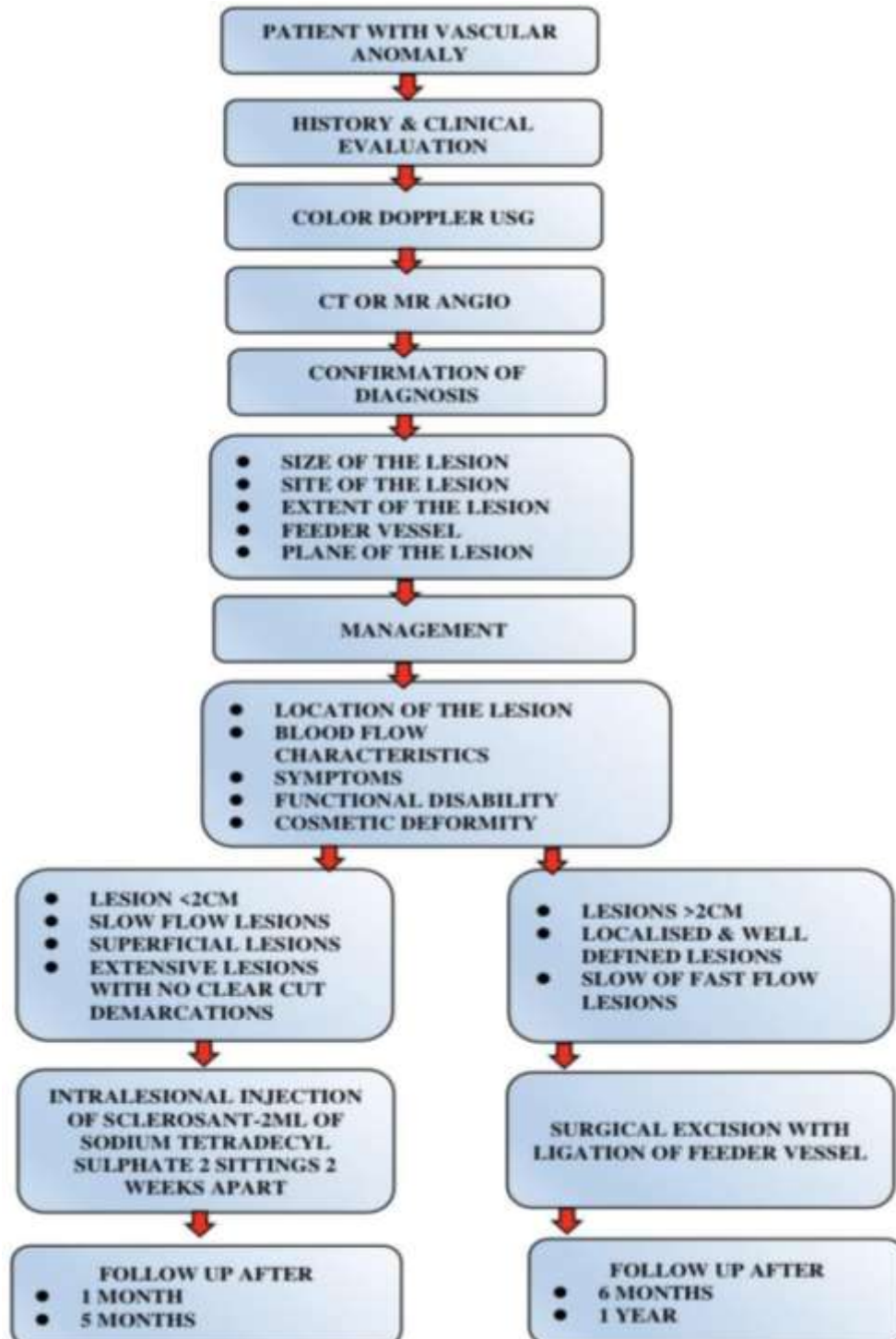
All patients with vascular anomalies admitted in the Dept of Plastic & Reconstructive Surgery willing to participate are included in the study

**Exclusion Criteria:**

1. Patients not willing to participate in the study
2. Patients who are unfit for anaesthesia
3. Patients with CNS AV Malformation

**Treatment Protocol:**

The treatment protocol for management of all the vascular anomalies case followed at our institute included:



Patients were informed regarding the aims and objectives of the study and a detailed informed written consent was taken before inclusion into the study. During hospitalisation, relevant history was collected and appropriate investigations deemed necessary were conducted using standard procedures. Patients were then classified according to the above mentioned treatment protocol and decision was made whether to proceed for Sclerotherapy sittings or direct surgical excisions. Follow up for upto 6months - 1 year was done and recurrence if any were recorded.

#### Statistical Analysis:

The collected data were entered in the Microsoft Excel 2016 and analysed with IBM SPSS Statistics for Windows, Version 29.0.(Armonk, NY: IBM Corp).To describe about the data descriptive statistics frequency analysis, percentage analysis were used for categorical variables and the mean & S.D were used for continuous variables.

#### Results and Observations:-

##### Demographic:

In the present study out of the 25 patients that presented to the plastic surgery OPD with vascular anomalies 15 were males (60%) and only 10 were females (40%) showing the male preponderance in our study.

The predominant age group in the study was 21-30 years and all the cases were identified to be vascular malformation and none were hemangioma or vascular tumor.

Among the most common site where the lesion was identified was found to be Head and neck region with the maximum number of cases presenting over the upper lip.

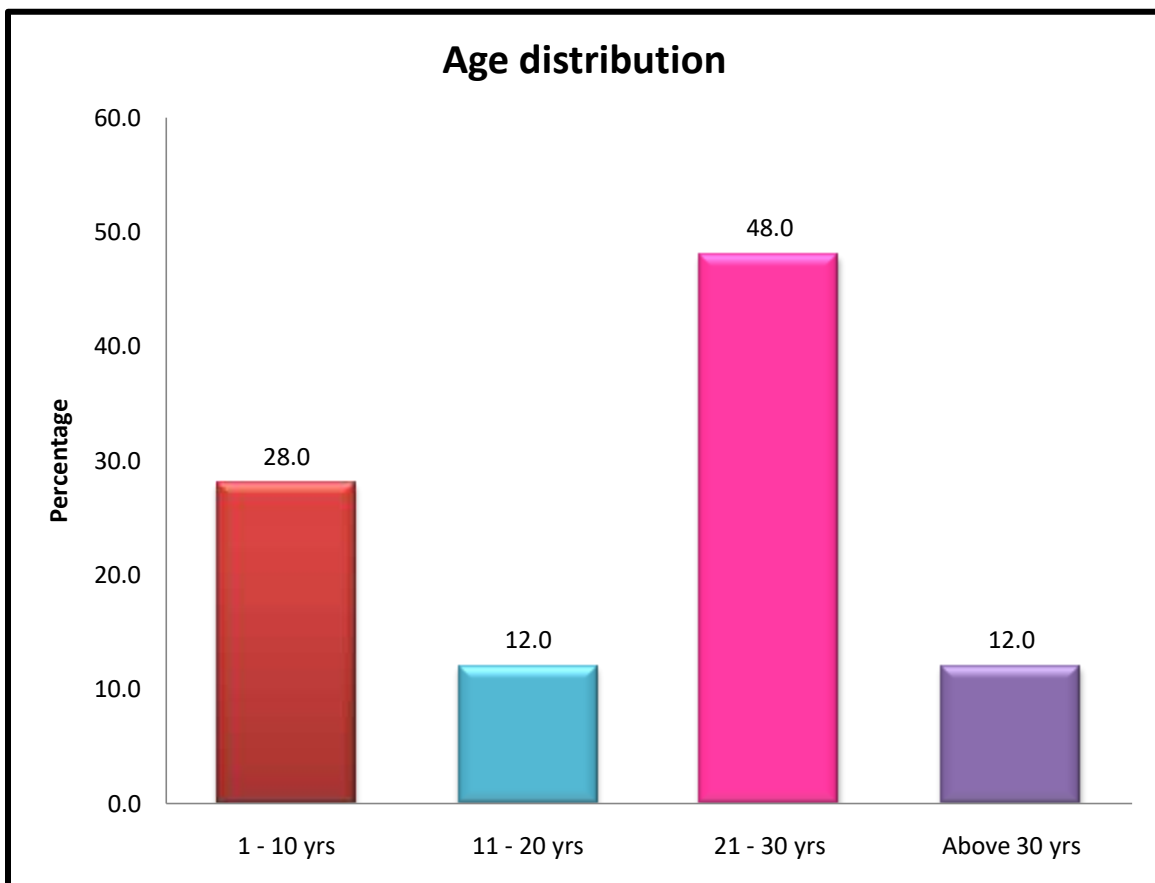


Figure 1:- Age distribution.

The above table shows Age distribution were 1-10 years is 28.0%, 11-20 years is 12.0%, 21-30 years is 48.0%, >30 years is 12.0%.

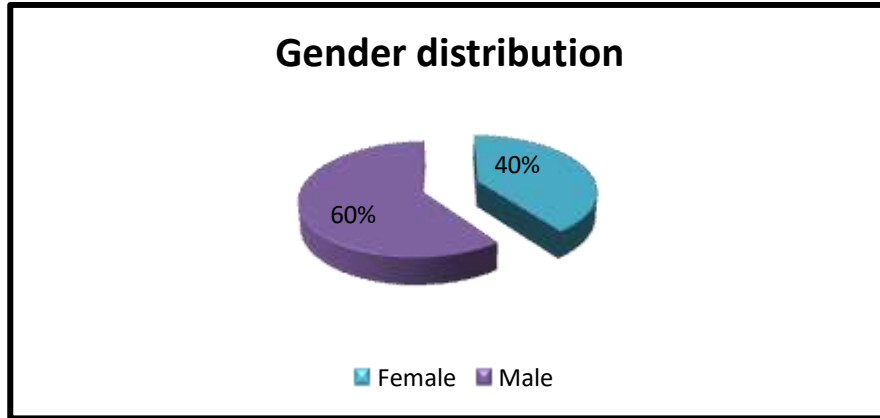


Figure 2:- Gender distribution.

The above table shows Gender distribution were Female is 40.0%, Male is 60.0%.

Figure 3:- Outcome distribution.

LOCATION	FREQUENCY	PERCENTAGE
1. HEAD & NECK	18	72%
2. UPPER LIMB	5	20%
3. TRUNK	1	4%
4. LOWER LIMB	1	4%

Figure 4

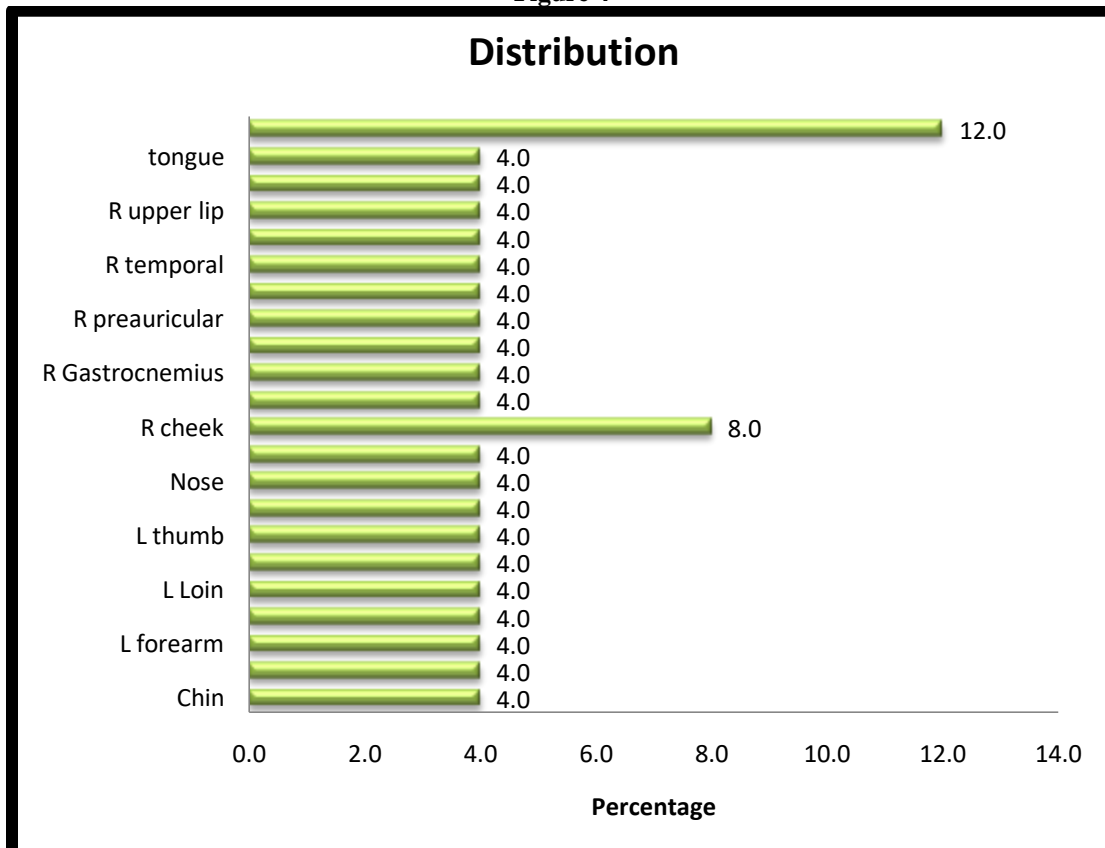


Figure 4:- The above table shows Outcome distribution were Upper lip has highest percentage (12.0%), and all other variables except R cheek has lowest percentage (4.0%).

**Treatment Analysis:**

As per our treatment protocol, lesions which were slow flow, superficial or less than 2 cm were subjected to sclerotherapy. Also lesions which were extensive and for whom surgical excision was difficult or impossible were subjected to palliative sclerotherapy for the reduction in vascularity.

In our study out of the 25 cases only 8 presented with lesions of dimensions less than or equal to 2x2cm of which 4 cases directly underwent surgical excision and 3 of them underwent sclerotherapy sittings while 1 underwent 2 sittings of sclerotherapy followed by surgical excision ( AVM thumb).

Among all the cases only the one which underwent both sclerotherapy and excision presented with recurrence and none of the others did.

The choice of sclerotherapy or surgical excision for lesions less than or equal to 2 cm were decided based on the location of the lesion and the flow characteristics. Lesions showing a fast flow pattern and not located in critical areas like near the eye were subjected to sclerotherapy for reduction of vascularity.

Lesions of dimensions 1x1cm were directly subjected to sclerotherapy sessions ( max of 4sessions 1 month apart) and in the follow up period of 5 months none presented with recurrence.

For lesions > 2cm also similar protocol was followed with high flow lesions getting preference of sclerotherapy sittings prior to surgical excision.

**Implication:**

In our study more than the dimensions, it's the flow characteristics which decided which treatment should be given first keeping the thought of recurrence and other complications in mind.

**Cosmetic Outcome:**

Sclerotherapy sessions usually don't lead to any cosmetic abnormalities as most fibrosis happens within the vascular tissues but on the other hand post surgical scars do matter. In our study most of the patients didn't develop any significant scar post surgery and the cosmesis post surgery was good. Except for a case of AVM nose for which post surgical scar over dorsum of the nose was significant and underwent another sitting of subcision and fat grafting with PRP for the same 3 months after excision of the AVM.

**Complications:**

The most common complication noted was recurrence which was seen in 6 out of the 25 cases during the follow up period of 12 months 2 of which were lost in follow up during the study period and later presented with recurrence.

It was noted that all the lesions which presented with recurrence were all extensive vascular malformations with diffuse lesions, 4 of which underwent multiple sittings of sclerotherapy followed by excision, 2 underwent palliative sclerotherapy and one underwent surgical excision alone. The other complications noted were difficulty in extension of digits in a case of venous malformation involving the forearm the follow up of whom with regular physiotherapy has shown improvement in function.

Treatment	Frequency	Percent
Sclerotherapy alone	5	20.0
Sclerotherapy followed by excision	5	20.0
Excision alone	15	60.0
Total	25	100.0

Figure 5:- Treatment distribution.

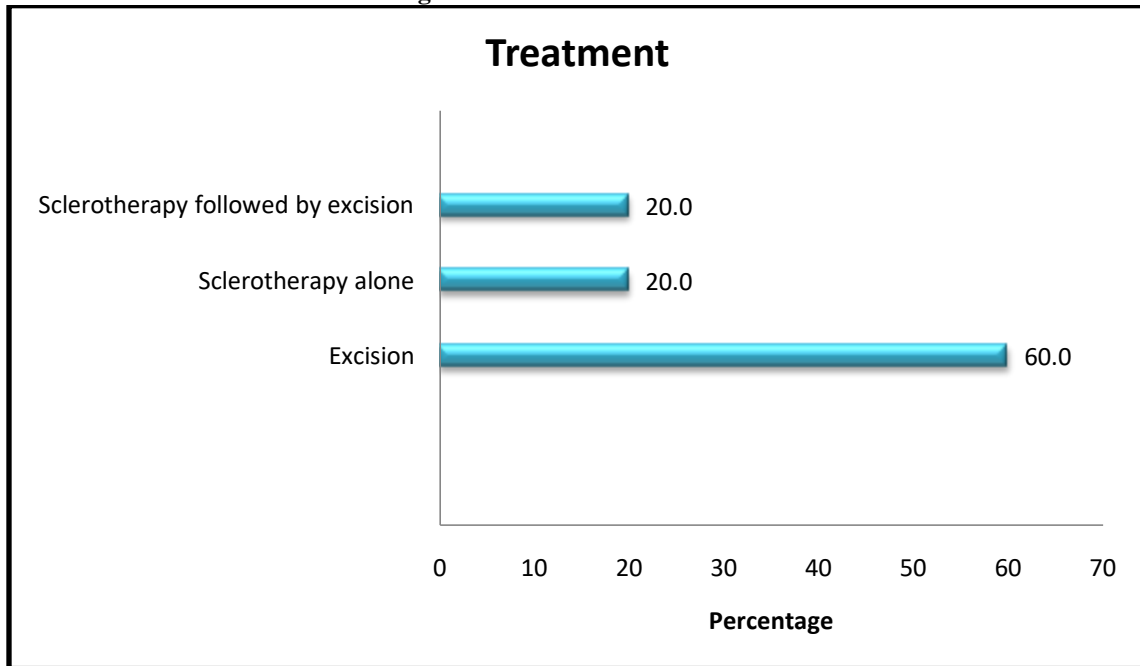
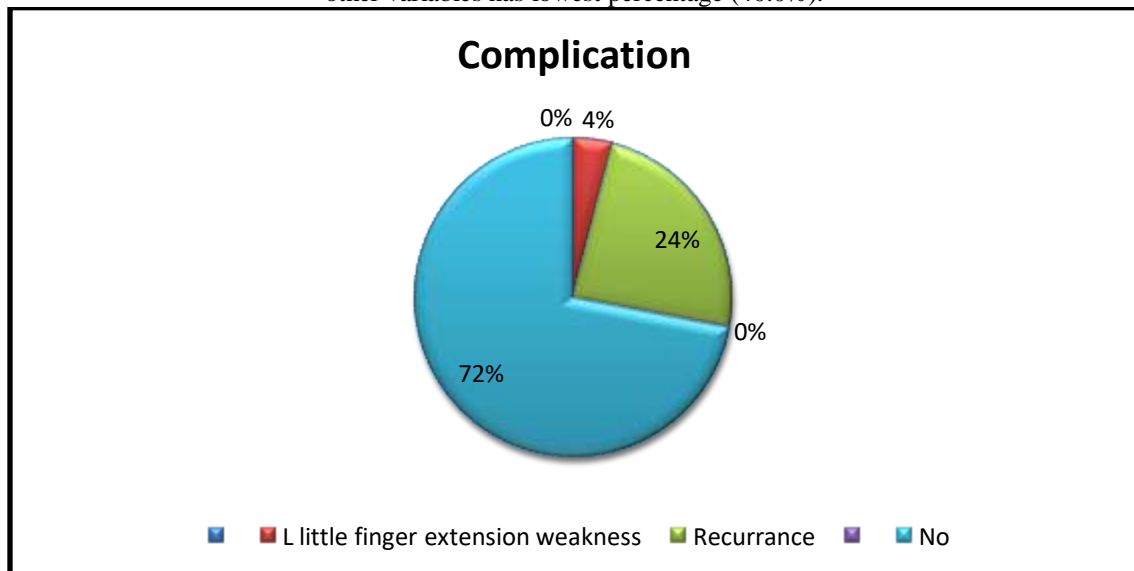


Figure 6:- The above table shows Treatment distribution were Excision has highest percentage (60.0%) and all other variables has lowest percentage (40.0%).



**Discussion:-**

Vascular anomalies signify a deviation from normal vasculature[1]. Their morbidity can range from mild discoloration over the skin to massive involvement leading to functional compromise. These anomalies include a group of disorders which are difficult to classify as well as to treat[1]. These lesions can cause cosmetic as well as functional deformities of the head and region mostly and are also often misdiagnosed hence proper management of these lesions with proper history taking and clinical evaluation and proper investigations like color doppler, MR Angiogram and CT Angiogram should be performed.

- As per our study, the most common age group that presented to our OPD with vascular malformations included between **21-30 years** (48%) and **males** were affected more than the females (60% > 40%)

- In this particular study also we have noticed that majority of the lesions developed in the head and neck region implying that **head and neck** is the most common site for vascular malformations of which **upper lip** was the most common site of incidence in our study.
- Syndromic association and family history were not seen with any of the cases that presented in our OPD
- **The functional outcome-** post excision functional disability was noticed in one case which was vascular malformation involving the forearm where the entire muscular compartment was affected, post excision of which extensor activity was affected which improved eventually with regular physiotherapy.
- **Cosmetic outcome** was good for a majority of the cases, with time scars also healed well but recurrence was seen in 2 of the cases which included vascular malformation of thumb and vascular malformation of R cheek which was a diffuse lesion and the treatment plan of which included 4 sittings of sclerotherapy 4 weeks apart.
- Out of the 25 cases that presented to our OPD, none of them were hemangioma, 5 cases of venous malformations were identified, 1 case of lymphatico-venous malformation and 19 cases of arterio-venous malformations were diagnosed.
- Since most of the cases that presented to our department were >2cm, trial of sclerotherapy prior to excision were not done instead direct excision was planned except for 5 cases which presented with diffuse swellings for which sclerotherapy was given prior to surgical excision for reducing the vascularity and hence improve the outcome of the surgery. Among the operated cases which are 22 recurrence was noted in 6 of the cases
- The common post op complications noted were- recurrence, flap necrosis and loss of function
- Sclerotherapy was effective for lesions of dimensions less than 2x2cm and no recurrence pattern was noted in those cases in the follow up duration of 1 year

### **Conclusion:-**

Understanding vascular anomalies is crucial for early diagnosis and management. With advances in imaging and treatment options, many patients can lead normal lives with appropriate care. Continued research is essential for developing innovative therapies and improving outcomes for those affected by these conditions.

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