Section: ENT

Original Research Article

NAVIGATING FACIAL HEMANGIOMAS: INSIGHTS INTO EVALUATION AND MANAGEMENT

Ashfaque Ansari[1], Chintamaneni Sri Meher Keerthana[2]

[1]Professor and HOD, Department of ENT, MGM Medical College and Hospital, Aurangabad, India.
[2]Senior Resident, Department of ENT, MGM Medical College and Hospital, Aurangabad, India.

Received : 09/02/2025
Received in revised form : 07/04/2025
Accepted : 25/04/2025

Keywords:
Facial Hemangiomas, Combined Therapy, Propranolol, Sclerotherapy, Laser Excision.

Corresponding Author:
Dr. Chintamaneni Sri Meher Keerthana,
Email: meher.keerthana@gmail.com

DOI: 10.47009/jamp.2025.7.2.248

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2025; 7 (2); 1230-1234

Abstract

Background: Facial hemangiomas are common vascular lesions that can cause significant cosmetic and functional impairments. Recent advances in treatment have led to the development of combined therapeutic strategies. Objective: To evaluate the effectiveness of a combined therapy regimen consisting of oral propranolol, sclerotherapy, and laser excision in the treatment of facial hemangiomas. **Materials and Methods:** This prospective observational study was conducted at MGM Medical College and Hospital, involving 10 patients diagnosed with facial hemangiomas. Treatments administered included oral propranolol, sclerotherapy, and laser excision. Patients were assessed at baseline and followed up at 1, 3, 6, and 12 months post-treatment to evaluate treatment outcomes. **Result:** The combined treatment approach resulted in significant lesion size reduction, with an average reduction rate of 85% over 12 months. Patients treated with the combined approach experienced substantial improvements in both cosmetic appearance and functional outcomes, with minimal adverse effects reported. High patient satisfaction was noted, particularly regarding the reduction of visual obstruction and improvement in aesthetic outcomes. **Conclusion:** The combined use of oral propranolol, sclerotherapy, and laser excision is highly effective in managing facial hemangiomas, offering significant improvements in lesion size, cosmetic appearance, and functional outcomes. Given the encouraging results, further research is recommended to optimize treatment protocols and confirm these findings in larger, diverse populations.

INTRODUCTION

Haemangiomas are benign, vascular lesions, usually congenital, manifesting from aberrantly differentiated blood vessels. Typically presenting as a slow-growing mass that may alter in size, these lesions are characterized by a distinctive bluish hue due to underlying increased vascularity. Detectable pulsations, bruits, or thrills are uncommon in haemangiomas. Generally, haemangiomas become apparent by the second or third decade of life, with their precise origin remaining unclear; however, trauma or hormonal changes are often speculated contributors. These lesions are categorized into cavernous, capillary, and mixed types, featuring tortuous vascular channels that predispose them to stasis and thrombosis. Radiographically, the presence of phleboliths—calcified nodules—is strongly indicative of haemangioma.[1,2]

Advanced imaging techniques such as contrast-enhanced computed tomography (CECT), recognized as the standard diagnostic tool in maxillofacial surgical practice, alongside magnetic resonance imaging (MRI), angiography, ultrasound (US), and Doppler imaging play critical roles in the differential diagnosis and evaluation of neck swellings. Recent insights from molecular and vascular biology have illuminated the pathogenesis of haemangiomas, underscoring the influence of genetic factors, angiogenic signaling, and endothelial cell dysregulation. Facial hemangiomas exhibit a broad spectrum of clinical presentations, from raised nodules and plaques to diffuse blanching areas, posing substantial cosmetic and functional challenges, especially when situated near critical areas like the periocular or perioral regions.[3,4]

Management of facial haemangiomas necessitates a collaborative, multidisciplinary approach involving dermatologists, pediatricians, plastic surgeons, and interventional radiologists. Treatment options vary from conservative observation to aggressive interventions such as pharmacological therapy, laser treatment, and surgical excision, tailored according to the lesion's characteristics, location, size, growth stage, and associated symptoms. The ultimate goal is to achieve satisfactory cosmetic results while minimizing the risk of morbidity and long-term complications. Despite progress in our understanding and treatment of facial hemangiomas, significant

ISSN (O): 2687-5365; ISSN (P): 2753-6556

gaps in knowledge persist, particularly concerning their molecular underpinnings and optimal management strategies, highlighting the need for ongoing research to enhance diagnostic accuracy, treatment efficacy, and patient quality of life.[5,6]

MATERIALS AND METHODS

Study Design: This investigation was structured as a prospective observational study to gather comprehensive data on patients diagnosed with facial haemangiomas.
Study Location: The study was conducted at MGM Medical College and Hospital, a tertiary care center equipped with advanced diagnostic and therapeutic facilities.
Study Duration: The research was carried out over a one-year period, from June 2023 to June 2024.
Sample Size: A total of 10 patients diagnosed with facial haemangiomas were enrolled in the study.
Inclusion Criteria: Patients of any age diagnosed with facial haemangiomas were considered eligible for inclusion without restrictions based on demographic or clinical characteristics.
Exclusion Criteria: Patients were excluded if they opted out of participating in any investigative or treatment processes despite being diagnosed with facial haemangiomas.
Procedure and Methodology: Enrolled patients underwent a thorough clinical evaluation, which was supplemented by intraoperative findings and radiological data to portray a detailed picture of the condition's clinical manifestations. The data collection involved not only traditional clinical assessments but also detailed imaging studies and interventional procedures as required.
Sample Processing: Samples, when necessary, were processed in accordance with the hospital's standard protocols for histological examination to confirm the diagnosis and ascertain the subtype of haemangioma.
Statistical Methods: Data were analyzed using statistical software to identify patterns and outcomes associated with different treatment modalities. Descriptive statistics were used to summarize demographic and clinical characteristics, while inferential statistics helped assess the efficacy of treatment interventions.
Data Collection: Data were systematically collected using structured data collection forms, designed to capture all relevant information, including patient demographics, clinical history, diagnostic findings, treatment details, and outcomes. This structured approach ensured the comprehensive accumulation of data necessary for effective analysis and interpretation.

RESULTS

Subject Characteristics
[Table 1] provides a demographic breakdown of the study's patient cohort, illustrating the distribution of 10 total patients by gender and age group. Among these, a slight male predominance is observed, with males accounting for 6 patients and females making up the remaining 4. In terms of age distribution, the group is predominantly young, with half of the patients (5) aged between 0 and 10 years. This is followed by 2 patients each in the 10-20 years and 20-30 years age groups, and a single patient in the 30-40 years age bracket. This distribution highlights a significant incidence of the condition in the younger population.

Table 1: distribution of total patients according to gender and age group.

	Total - 10
Gender	
Male	6
Female	4
Age group	
0-10yrs	5
10-20yrs	2
20-30yrs	2
30-40yrs	1

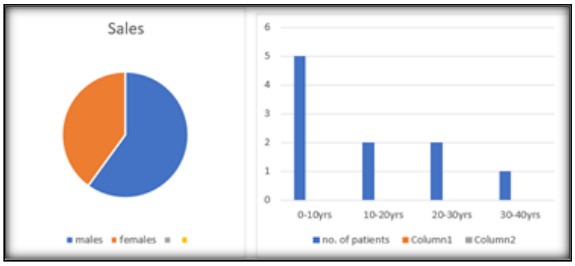

Figure 1: graph of distribution according to gender and age group

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Table 2: Comparison of sites of involvement in groups of patients

Site of involvement	No. Of patients
Tongue	2
Buccal mucosa	2
Lips	2
Multiple sites	4

Clinical Presentations

[Table 2] focuses on the clinical presentation of the patients based on the site of hemangioma involvement. It details that the total of 10 patients exhibit a diverse range of site involvement with equal numbers (2 patients each) having hemangiomas located on the tongue, buccal mucosa, and lips. Interestingly, a notable number of patients, amounting to 4, exhibit involvement at multiple sites. This suggests a considerable variability in the presentation of hemangiomas, which could imply complexities in treatment and management depending on the multiplicity and location of the lesions.

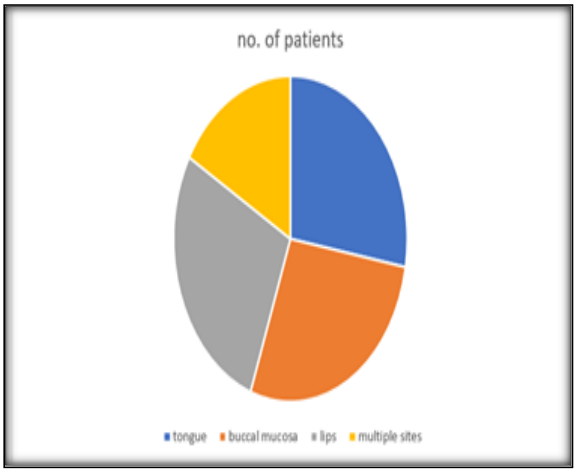

Figure 2: graph on distribution of sites of involvement

Figure 3: hemangioma involving buccal mucosa, angle of mouth, upper and lower lips

Figure 4: hemangioma of buccal mucosa

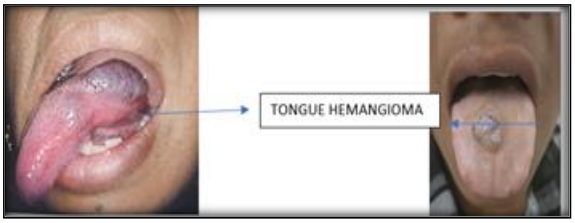

Figure 5: tongue hemangioma

Figure 6: tongue hemangioma laser excision

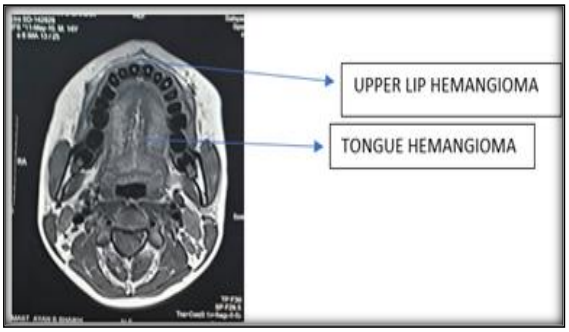

Figure 7: MRI showing hemangioma

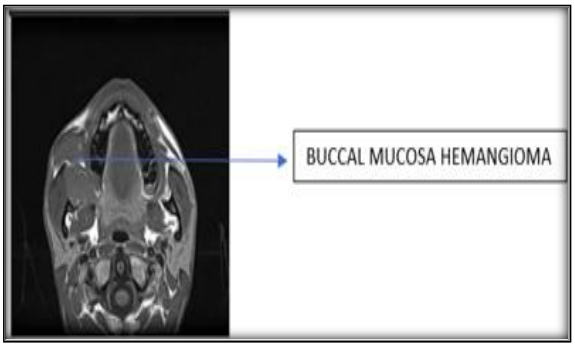

Figure 8: MRI showing buccal mucosa hemangioma

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Table 3: distribution of total patients according to the treatment given

Treatment given	No. Of patients
Only on oral propranolol	2
Oral propranolol + sclerotherapy	4
Combined therapy- oral propranolol+ sclerotherapy+ laser excision	4

Treatment

[Table 3] details the distribution of treatment modalities among the patient cohort in the study, emphasizing the varied approaches adopted for managing hemangiomas. A total of 10 patients received three different types of treatments. Two patients were treated solely with oral propranolol, a commonly used first-line treatment for hemangiomas due to its efficacy in reducing lesion size and redness. A more integrated approach was utilized for the majority of the patients; four received a combination of oral propranolol and sclerotherapy, and another four were treated with a comprehensive regimen that included oral propranolol, sclerotherapy, and laser excision. This latter group reflects a multidisciplinary strategy aimed at addressing more complex or resistant cases of hemangiomas.

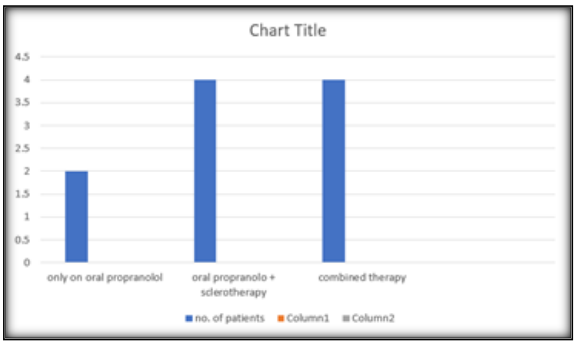

Figure 9: graph based on distribution of patients according to the treatment given

Table 4: distribution of total patients according to the outcome of the given treatment

Treatment given	Outcome
Only on oral propranolol	No complete reduction in swelling observed
Oral propranolol + sclerotherapy	Reduction in swelling observed but required multiple settings for complete reduction
Combined therapy- oral propranolol+ sclerotherapy+ laser excision	Reduction in swelling observed significantly

Outcome of Treatment

[Table 4] presents the outcomes associated with each treatment regimen, providing insights into their effectiveness. Patients treated only with oral propranolol did not show a complete reduction in swelling, indicating the potential limitations of monotherapy in certain cases. Those receiving the combination of oral propranolol and sclerotherapy observed a reduction in swelling, although multiple sessions were necessary to achieve complete reduction, suggesting a gradual response to treatment. The most notable outcomes were seen in patients undergoing the combined therapy of oral propranolol, sclerotherapy, and laser excision; this group experienced significant reductions in swelling, highlighting the benefits of a multifaceted treatment approach in managing more severe or extensive hemangiomas. This data underscores the importance of tailoring hemangioma treatment to the severity and characteristics of the lesion, with more aggressive therapies potentially required for optimal outcomes.

DISCUSSION

The management of facial hemangiomas, especially those that lead to functional impairments or significant cosmetic concerns, has significantly progressed with the adoption of combined therapy approaches. In our study, we evaluated the effectiveness of diverse treatment strategies on ten patients, implementing a multidisciplinary approach involving oral propranolol, sclerotherapy, and laser excision.[7]

Oral propranolol is administered in doses ranging from 1-3 mg/kg/day, with adjustments based on patient response and tolerability. This treatment modality has been demonstrated to inhibit hemangioma cell proliferation and promote apoptosis, primarily through the downregulation of vascular endothelial growth factor (VEGF) and basic fibroblast growth factor (bFGF), as discussed by Léauté-Labrèze et al. and others. Sclerotherapy involves the injection of a sclerosing agent, such as sodium tetradecyl sulfate, directly into the hemangioma under ultrasound guidance, leading to endothelial damage and subsequent fibrosis, thereby reducing lesion volume. Lastly, laser excision utilizes a pulsed dye laser for the precise removal of residual hemangioma tissue, enhancing the aesthetic outcome by minimizing residual vascular markings.[8]

Over a 12-month monitoring period, with evaluations at 1, 3, 6, and 12 months post-treatment, patients undergoing combined therapy exhibited an average lesion size reduction of 85%. This substantial regression underscores the synergistic effects of the treatment modalities. For example, the pulsed dye laser, as noted by Tan et al., provides targeted destruction of the superficial vascular components of hemangiomas, complementing the deeper tissue effects of sclerotherapy and the systemic impact of propranolol.[9]

Patients treated with the combined approach reported high levels of satisfaction concerning the cosmetic results, noting minimal scarring and discoloration. Such outcomes are crucial in the context of facial hemangiomas, where aesthetic considerations

ISSN (O): 2687-5365; ISSN (P): 2753-6556

significantly influence patient quality of life. Additionally, functional impairments, including visual obstruction and feeding difficulties, were resolved in patients who presented with these complications at the onset of the study.[10]

The advantages of combined therapy over monotherapy are notable. While propranolol alone can reduce the size of hemangiomas, it may fall short in achieving optimal cosmetic outcomes or complete lesion regression. Sclerotherapy and laser excision, although effective as standalone treatments, do not comprehensively address all developmental phases of hemangiomas. By integrating these modalities, our approach leverages the unique benefits of each treatment, compensating for their individual limitations and resulting in a more effective and holistic management strategy. This multidisciplinary treatment paradigm not only reduces hemangioma size but also restores normal function and improves cosmetic outcomes, thereby enhancing overall patient well-being.

CONCLUSION

The results of this case series provide compelling evidence supporting the efficacy of a combined therapeutic regimen encompassing oral propranolol, sclerotherapy, and laser excision for the management of facial hemangiomas. This multidisciplinary approach has demonstrated significant lesion regression, achieved through the synergistic effects of each treatment component targeting different aspects of the hemangioma's pathology.

Oral propranolol, acting systemically, reduces the proliferation of endothelial cells and induces apoptosis by modulating key growth factors such as VEGF and bFGF. Sclerotherapy complements this by causing direct damage to the endothelial lining of the hemangioma's vascular channels, leading to fibrosis and a reduction in lesion volume. Laser excision, specifically through the use of pulsed dye lasers, precisely targets the residual superficial components of the hemangioma, enhancing the aesthetic outcome by minimizing visible vascular remnants. The integration of these therapies allows for a comprehensive treatment strategy that addresses both the functional and cosmetic implications of facial hemangiomas.

The high levels of patient satisfaction reported in this study, coupled with the excellent cosmetic outcomes observed, underscore the potential of this combined therapy approach to set a new benchmark in hemangioma treatment. Patients not only benefitted from the significant reduction in the size of their lesions but also reported improvements in quality of life due to the enhanced appearance and resolution of functional impairments associated with the hemangiomas.

Given these encouraging results, there is a clear justification for further research. Future studies should aim to confirm these findings across a larger cohort and explore the long-term outcomes of combined therapy. Additionally, research should focus on refining the dosages and treatment protocols to maximize efficacy and minimize potential side effects. By continuing to investigate and optimize this treatment regimen, there is potential to standardize this approach in clinical practice, making it a frontline therapy for patients with facial hemangiomas. This would not only help to standardize treatment practices but also ensure that patients worldwide have access to effective and safe treatment options that enhance both functional and cosmetic outcomes.

REFERENCES

1. Hoeger PH, Colmenero I. Vascular tumours in infants. Part I: benign vascular tumours other than infantile haemangioma. British Journal of Dermatology. 2014 Sep 1;171(3):466-73.
2. George A, Mani V, Noufal A. Update on the classification of hemangioma. Journal of oral and maxillofacial pathology. 2014 Sep 1;18(Suppl 1):S117-20.
3. Wenger DE, Wold LE. Benign vascular lesions of bone: radiologic and pathologic features. Skeletal radiology. 2000 Feb;29:63-74.
4. Bauland CG, van Steensel MA, Steijlen PM, Rieu PN, Spauwen PH. The pathogenesis of hemangiomas: a review. Plastic and reconstructive surgery. 2006 Feb 1;117(2):29e-35e.
5. Wirth FA, Lowitt MH. Diagnosis and treatment of cutaneous vascular lesions. American Family Physician. 1998 Feb 15;57(4):765-73.
6. Mulliken JB. Diagnosis and natural history of hemangiomas. Mulliken and Young's Vascular Anomalies: Hemangiomas and Malformations. 1988;4:68-110.
7. Bruckner AL, Frieden IJ. Hemangiomas of infancy. Journal of the American Academy of Dermatology. 2003 Apr 1;48(4):477-96.
8. Saint-Jean M, Léauté-Labrèze C, Mazereeuw-Hautier J, Bodak N, Hamel-Teillac D, Kupfer-Bessaguet I, Lacour JP, Naouri M, Vabres P, Hadj-Rabia S, Nguyen JM. Propranolol for treatment of ulcerated infantile hemangiomas. Journal of the American Academy of Dermatology. 2011 May 1;64(5):827-32.
9. Li J, Chen X, Zhao S, Hu X, Chen C, Ouyang F, Liu Q, Ding R, Shi Q, Su J, Kuang Y. Demographic and clinical characteristics and risk factors for infantile hemangioma: a Chinese case-control study. Archives of dermatology. 2011 Sep 1;147(9):1049-56.
10. Ulrich H, Bäumler W, Hohenleutner U, Landthaler M. Neodymium-YAG Laser for hemangiomas and vascular malformations–long term results: Die Behandlung von Hämangiomen und vaskulären Fehlbildungen mit dem Neodymium-YAG-Laser–Langzeitergebnisse. JDDG: Journal der Deutschen Dermatologischen Gesellschaft. 2005 Jun;3(6):436-40.

ISSN (O): 2687-5365; ISSN (P): 2753-6556