

Case Report

## Intramuscular Haemangioma in Masseter Muscle: A Case Report

Sanjay Mhalasakant Khaladkar<sup>1\*</sup>, Vigyat Kamal<sup>2\*</sup>, Mansi Sidharth Dhende<sup>2\*\*</sup>, Anubhav Kamal<sup>2\*</sup>

<sup>1</sup>Professor, <sup>2</sup>PG Student,

\*Department of Radiology, Dr. DY Patil Medical College & Research Center, Pimpri, Pune.

\*\*Department of General Surgery, Dr. DY Patil Medical College & Research Center, Pimpri, Pune.

Corresponding Author: Vigyat Kamal

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### ABSTRACT

Intramuscular haemangiomas are rare benign vascular tumours noted in superficial or deep planes of the trunk and extremities. Intramuscular haemangiomas are rather infrequent, amongst which masseter and trapezius muscles are affected in less than 1 % cases of all haemangiomas. These lesions being infrequent, deep seated and with unacquainted presentation are important to diagnose for both the clinicians and radiologists. MRI is extremely useful in accurately assessing the cause of facial asymmetry, characterizing the lesion with its extent and morphological features. We report a case of 7 year old female child with painless soft tissue mass in the right sided pre-auricular region, confirmed on imaging findings as intramuscular haemangioma in masseter muscle.

**Keywords:** Hemangioma, Masseter Muscle, Masticatory Muscles, Hypertrophy of, Sclerotherapy, Magnetic Resonance Imaging, Ultrasonography, Doppler, Color.

### INTRODUCTION

Vascular malformations are usually of benign histological origin. Several types have been identified, including low flow malformations, high flow malformations and vascular tumours (infantile haemangioma). Low flow malformations consist of venous, lymphatic and capillary. High flow malformations consist of arteriovenous malformation. These are congenital anomalies and present at birth. Haemangioma is a benign endothelial neoplasm and includes subtypes namely, haemangioma of infancy, congenital haemangioma and kaposiform hemangioendothelioma. [1]

These angiomatous lesions are 7 % of all benign soft tissue tumours showing a female predominance. According to histology, these are of 5 types, namely, capillary, arteriovenous, venous, mixed and cavernous type. Capillary types are located

in the skin, subcutaneous tissue, or vertebral bodies and spontaneously involute. Cavernous type consists of dilated, blood filled spaces with flattened endothelial lining, commonly show calcifications and do not show spontaneous involution. Arteriovenous haemangioma consist of an abnormal connection between the arteries and veins. These may be deep or superficial. Venous type is usually located in deep structures like retroperitoneum, mesentery and extremities. These vascular malformations commonly show thrombus, calcification, hemosiderin, fat, smooth muscle and fibrous tissue. [2]

Superficial lesions can be diagnosed on clinical examination because of evident skin discoloration. Deep seated lesions grow slowly and require imaging for diagnosis. [3]

### CASE REPORT

A 7 year old female child presented

with complaints of swelling on right side of face in pre-auricular region since 1 year, which was initially small in size and then gradually increased to present size. She had incidentally noticed the swelling and resultant facial asymmetry 4 months back. There was no history of trauma, fever or any discharge from the swelling. Clinical examination revealed a diffuse, painless swelling near the parotid region on the right side which was soft in consistency with restricted mobility in the vertical plane. Overlying skin could be pinched separately. On clenching, the swelling became prominent. Intra-oral examination was inconclusive. Routine haematological investigations were within normal limits. USG local swelling was performed and revealed well defined, lobulated, heterogeneous, predominantly hypo- to anechoic, septated, ovoid shaped lesion in the bulk of right masseter muscle showing internal vascularity with low peak systolic

velocity (Figure 1, 2). There was no evidence of calcifications or solid component within. Left sided masseter muscle showed normal morphology (Figure 3). Plain MRI revealed a well-defined ovoid shape lesion in the right sided masseter muscle measuring 2.9 x 1.5 x 2.1 cm in anteroposterior, transverse and craniocaudal planes respectively. It appeared slightly hyperintense with respect to muscle on T1WI, heterogeneously hyperintense on T2WI with multiple linear fibrous septa within (Figure 5). Few small hypointense foci were noted representing fibrous septa (Figure 4). No demonstrable phleboliths were noted. Rest of the visualized muscles, including left masseter, medial and lateral pterygoid muscles on either side were normal. After considering the clinical profile and imaging findings, a diagnosis of intramuscular cavernous haemangioma in right masseter muscle was given.

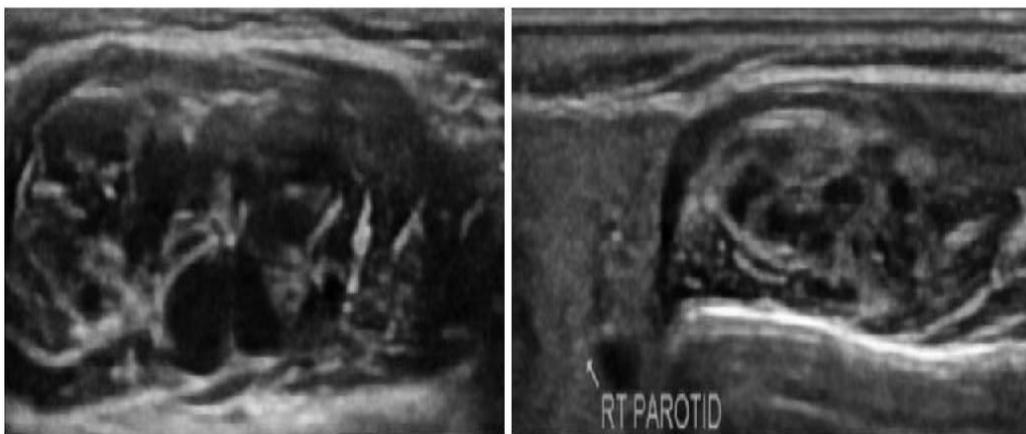


Figure 1: USG showing well defined, lobulated, heterogeneous, hypo- to anechoic, septated lesion in the bulk of right masseter muscle. Lesion is seen separately from the parotid gland.

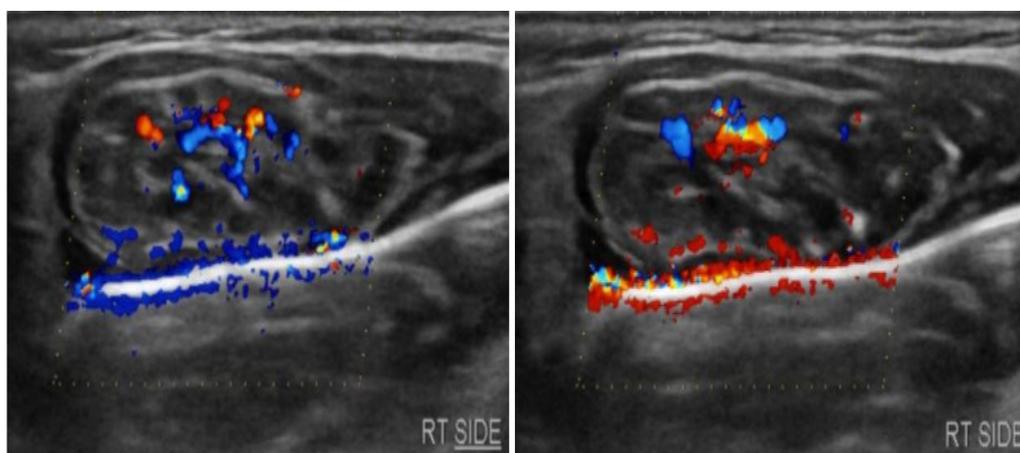


Figure 2: Color Doppler showing low velocity color flow within the lesion.

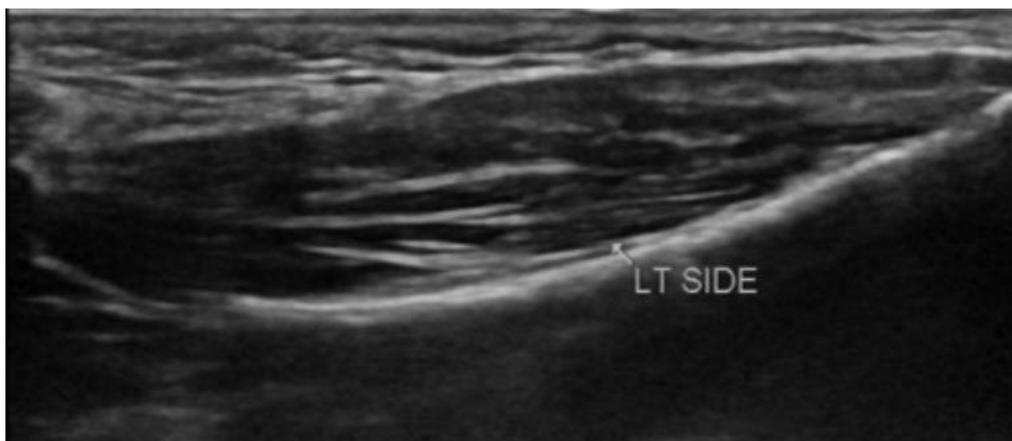


Figure 3: USG showing normal appearance of left masseter muscle.

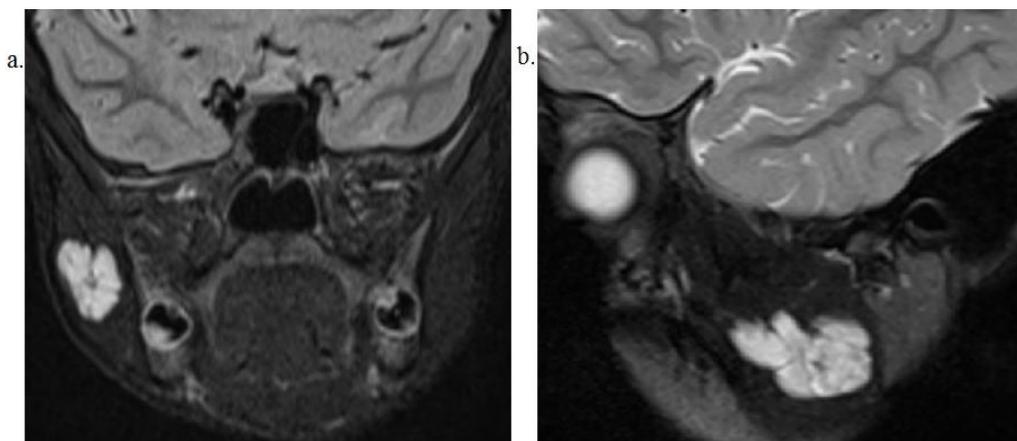


Figure 4: a) Coronal STIR and b) T2W sagittal MR showing well-defined ovoid shape lesion in the right masseter muscle appearing heterogeneously hyperintense with multiple hypointense fibrous septa within.

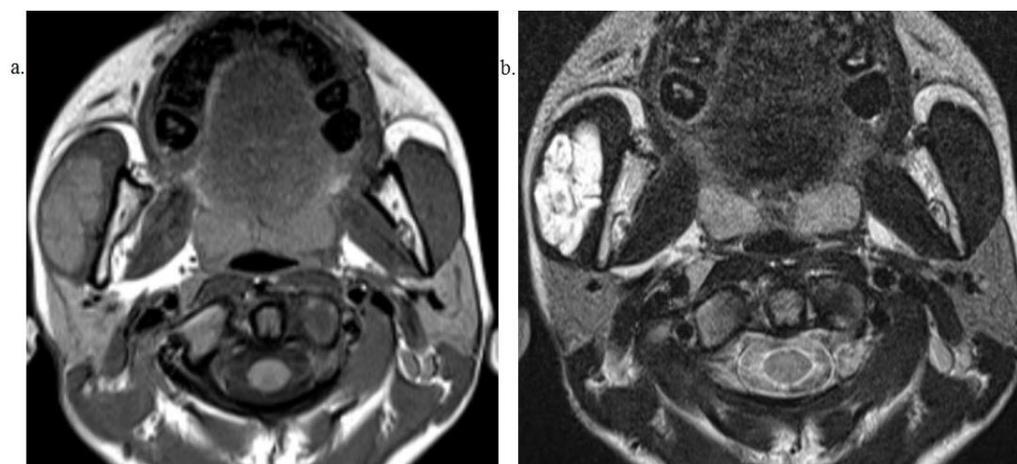


Figure 5: a) Axial T1W and b) Axial T2W MR showing the mildly hyperintense lesion on T1WI appearing predominantly hyperintense on T2WI. Rest of the visualized muscles, including left masseter, medial and lateral pterygoid muscles on either side were normal.

## DISCUSSION

Intramuscular haemangiomas are thought to be hamartomatous, congenital neoplasms. These are infrequent in head and neck region. Intramuscular haemangiomas are located in masseter, trapezius, pterygoid, thyrohyoid, larynx, sternocleidomastoid,

orbital and posterior neck muscles. Intramuscular haemangioma was initially diagnosed by LISTEN in 1843. Intramuscular haemangiomas constitute 1 % of all haemangiomas and are usually found in adolescents and young adults before 30 years of age. Patients usually present with

facial asymmetry, local swelling becoming apparent on teeth clenching or during mastication. These swellings are found to be painless, palpable mass in the muscle. [4,5]

A characteristic feature of intramasseter and intraparotid haemangiomas is the turkey wattle sign which is the enlargement of the lesion after clenching of teeth or dependent head positioning due to intra-lesional vascular engorgement, which results in hampering of venous return from the head to superior vena cava. [6]

### **Patients are subjected to USG, CT, MRI and angiography**

On USG, these lesions appear as a heterogeneous poorly defined mass with mixed hypoechoic and hyperechoic (relative fat overgrowth) component. Phleboliths are seen as bright echogenic foci with posterior acoustic shadowing in the central hypoechoic part of the lesion. Vascular channels are seen as an intralesional hypervascular flow with low resistance flow on Doppler. [7]

On CT, these lesions appear heterogeneously hypoattenuating with hyperdense phleboliths and peripheral post contrast enhancement. CT is also used to assess bony changes like cortical thickening or periosteal reaction. However, MRI is far superior for soft tissue evaluation than CT. [8]

MRI offers excellent soft tissue contrast, multiplanar imaging capability, and non-invasive nature without any radiation exposure. Haemangioma show high signal intensity on T2W image because of high fluid content secondary to stagnation of blood within the large vessels with heterogeneous signal on T1W and T2W images due to haemorrhagic, calcified and fatty components. Fibrous septae are seen as hypointense reticulations with foci of low signal intensity i.e. phlebolith. Ultimately, lobulated appearance with fluid-fluid levels is seen. [4,3]

Direct percutaneous phlebography is usually performed as an initial step during sclerotherapy with 20 or 21 gauge needles

under USG or CT guidance. Opacification of the vascular lesions with low osmolarity iodinated contrast is done. Different phlebographic patterns observed are: 1) cavitory pattern with late venous drainage without abnormal veins, 2) spongy pattern showing small honeycomb cavities and late venous drainage, and 3) third dysmorphic veins showing rapid onset post contrast opacification. [8]

Haemangiomas show a close differential diagnostic relationship with malignant soft tissue masses and hence should be evaluated accurately. Intramuscular mass lesions of masseter consist of lymphadenopathy, congenital cyst, sialoceles of parotid duct, parotid neoplasm, lymphangioma, masseteric hypertrophy, benign or malignant muscle tumour and schwannoma. Central hypointense dot sign is also noted in benign neurofibroma giving a target-like appearance, however contrast enhanced MRI can be used to differentiate between haemangioma and neurofibroma. Unlike haemangioma, central hypointense dot sign in neurofibroma caused by dense collagen does not show post contrast enhancement. The combination of lobulated, septate appearance, central T2 hypointense dot sign, hyperintense T2 signal and vivid post contrast enhancement on T1WI favours the diagnosis of haemangioma. [9]

Treatment of these lesions depends on several factors like location, extent of the lesion, flow characteristics, accessibility, and cosmetic considerations. In well circumscribed symptomatic lesions, surgical removal is the treatment of choice. However, multiple risk factors like risk of bleeding, loss of motor function and nerve function are associated with surgery as there is proximity with the facial nerve. Postoperative cases with masseter muscle excision result in flattening of the facial contour on one side. Other management options are non-surgical namely, sclerotherapy, embolization, laser therapy and cryotherapy. Various sclerosant agents used to destroy the vascular endothelium are

chemical agents such as ethanol or iodine, detergents like sodium tetradecyl sulphate, polidocanol, sodium diatrizoate and osmotic agents like salicylates and hypertonic saline.

Contraindications of sclerotherapy are neurological impairment, signs and symptoms of compression and multiple intralesional thrombosis. Complications of sclerotherapy are haemoglobinuria, ulceration, renal toxicity, nerve injury, skin necrosis, infection and accidental injection into the systemic circulation.

Selective photohaemolysis is the core principle of laser therapy. Small oral mucosal lesions are treated by using carbon dioxide laser. Small superficial venous or capillary lesions can be treated with photocoagulation with argon or neodymium doped yttrium aluminium garnet laser. Dermal and/or submucosal fibrosis and thickening are triggered by laser photocoagulation. Embolization with absorbable or nonabsorbable materials is used to reduce the lesion size prior to open surgical procedure. <sup>[10]</sup>

## CONCLUSION

Intramuscular soft tissue lesions should be differentiated from vascular malformations as a management strategy varies from conservative type to surgical excision. Diagnosis should be made by assessing history, clinical examination and imaging findings altogether as it may aid in the characterization and management of the lesions on a case by case basis.

## REFERENCES

1. Flors L, Leiva-Salinas C, Maged IM, Norton PT, Matsumoto AH et al. MR imaging of soft-tissue vascular malformations: diagnosis, classification, and therapy follow-up. *Radiographics*. 2011 Sep-Oct; 31(5): 1321-40; discussion 1340-1. PMID: 21918047.
2. Olsen KI, Stacy GS, Montag A. Soft-tissue cavernous hemangioma. *Radiographics*. 2004 May-Jun; 24(3): 849-54. PMID: 15143233.
3. Pourbagher A, Pourbagher MA, Karan B, Ozkoc G. MRI manifestations of soft-tissue haemangiomas and accompanying reactive bone changes. *Br J Radiol*. 2011 Dec; 84(1008):1100-8. PMID: 21123304.
4. Bayaroğulları H, Çokkeser Y, Akbay E, Karaoğlu E et al. Intramuscular cavernous hemangiomas arising from masseter muscles. *J Clin Exp Invest* 2012; 3 (3): 404-408.
5. Nayak S, Shenoy A. Intra-muscular hemangioma: A review. *J Orofac Sci* 2014; 6:2-4.
6. Koltsidopoulos P, Skoulakis C. Intramuscular hemangioma with turkey wattle sign. *CMAJ*. 2015 Mar 3; 187 (4):277. PMID: 25512657.
7. Jin W, Kim GY, Lee JH, Yang DM, Kim HC et al. Intramuscular hemangioma with ossification: emphasis on sonographic findings. *J Ultrasound Med*. 2008 Feb; 27(2):281-5. PMID: 18204020.
8. Dubois J, Soulez G, Oliva VL, Berthiaume MJ, Lapierre C, Therasse E. Soft-tissue venous malformations in adult patients: imaging and therapeutic issues. *Radiographics*. 2001 Nov-Dec; 21(6):1519-31. PMID: 11706222.
9. Teo EL, Strouse PJ, Hernandez RJ. MR imaging differentiation of soft-tissue hemangiomas from malignant soft-tissue masses. *AJR Am J Roentgenol*. 2000 Jun; 174(6):1623-8. PMID: 10845496.
10. Jayaraman V, Austin RD, Kannan S. Nonsurgical management of vascular malformation of masseter. *Indian J Dent Res*. 2015 Jan-Feb; 26 (1):96-100. PMID: 25961625.

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