

Common venous malformation in temporal muscle

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Section: Head & neck imaging

Area of Interest: Head and neck

Procedure: Imaging sequences

Imaging Technique: MR

Special Focus: Tissue characterisation Case Type:

Clinical Cases

Authors: Ana Leben, Jernej Avsenik

Patient: 12 years, female

Clinical History:

Patient presented with intermittent headaches, similar to migraine with aura.

Imaging Findings:

MRI revealed well delineated and slightly lobulated formation in the right temporal muscle measuring 4.6 x 3.6 x 1.3 cm. The formation was predominantly hyperintense on T2-weighted and STIR images and isointense with skeletal muscle on T1. Few small areas with high signal on T1 and low signal on T2 and SWI were interpreted as phlebolits or small haemorrhagic foci.

Gradual filling with contrast was observed during the course of examination. Prominent venous structure was noted at the cranial border of the formation. MRI signs of aggressive growth such as oedema were absent. Furthermore, ultrasound with colour Doppler was performed, confirming low-flow vascular malformation with predominantly venous signal.

Discussion:

Background

Abnormal proliferation of blood vessels is distinctive for common venous malformations [1] - benign vascular lesions, which typically manifest themselves in first two or three decades of life [2, 3]. They may present in any vascularized tissue, most commonly in subcutaneous and mucosal tissues. On the other hand, intramuscular venous malformations, arising from skeletal muscles, are rare - they account for less than 1% and only 14% of these occur in head and neck musculature [2-7]. Most frequently affected muscle is the masseter muscle, while the involvement of the temporal muscle is extremely rare [2]. Moreover, only 27 cases of venous malformations in the temporal muscle were reported till July 2014 [4]. Etiologically, there have been hypotheses of both congenital and postnatal causes, such as trauma and hormonal change [2, 5].

Clinical Perspective

Intramuscular common venous malformations usually presents with pain and discomfort or cause cosmetic deformities due to progressive enlargement [2, 3, 6]. Since they are infrequent, located in relatively deep tissues and have quite uncharacteristic presentation, these formations may be challenging to diagnose [6].

Imaging Perspective

MRI is the imaging modality of choice, being able to differentiate the lesion and its vascular structure from

surrounding tissues. These lesions are located within the muscle and appear isointense on T1-weighted images and hyperintense on T2-weighted images [2, 5, 6, 7]. Phleboliths, which are presented in around 20% of intramuscular lesions, appear mostly hypointense on T1/T2-weighted images [5]. These formations have endothelial-lined vascular channels with fibrous or fatty tissue in-between. Also hemosiderin depositions or thrombi may be present [2, 5]. Ultrasound with Colour Doppler sonography is useful for distinguishing from other pathological lesions, clearly demonstrating blood flow characteristics [6]. CT and arteriography are possibilities as well, but are less commonly used [2, 5].

Outcome

Different treatment options exist, from simple observation, irradiation (inadvisable for children) and sclerosation to corticosteroids, embolization and surgical excision [2, 5]. Treatment approach should be individualized, but nevertheless, surgical excision is the treatment of choice [5, 6]. Long term follow-up after excision is advised due to relatively high recurrence rate (9-28%) of these lesions [2, 6, 7].

Teaching points

Intramuscular common vascular malformations arising from temporal muscle are very rare. These lesions can be fairly confidently diagnosed by using MRI, however ultrasound may be helpful as well, revealing blood flow characteristics.

Written informed patient consent for publication has been obtained.

Differential Diagnosis List: Intramuscular common venous malformation., Neurofibroma, Lipoma, Angiolipoma, Dermoid cyst, Enlarged lymph nodes, Arterio-venous malformation, Soft-tissue sarcoma, Myositis ossificans

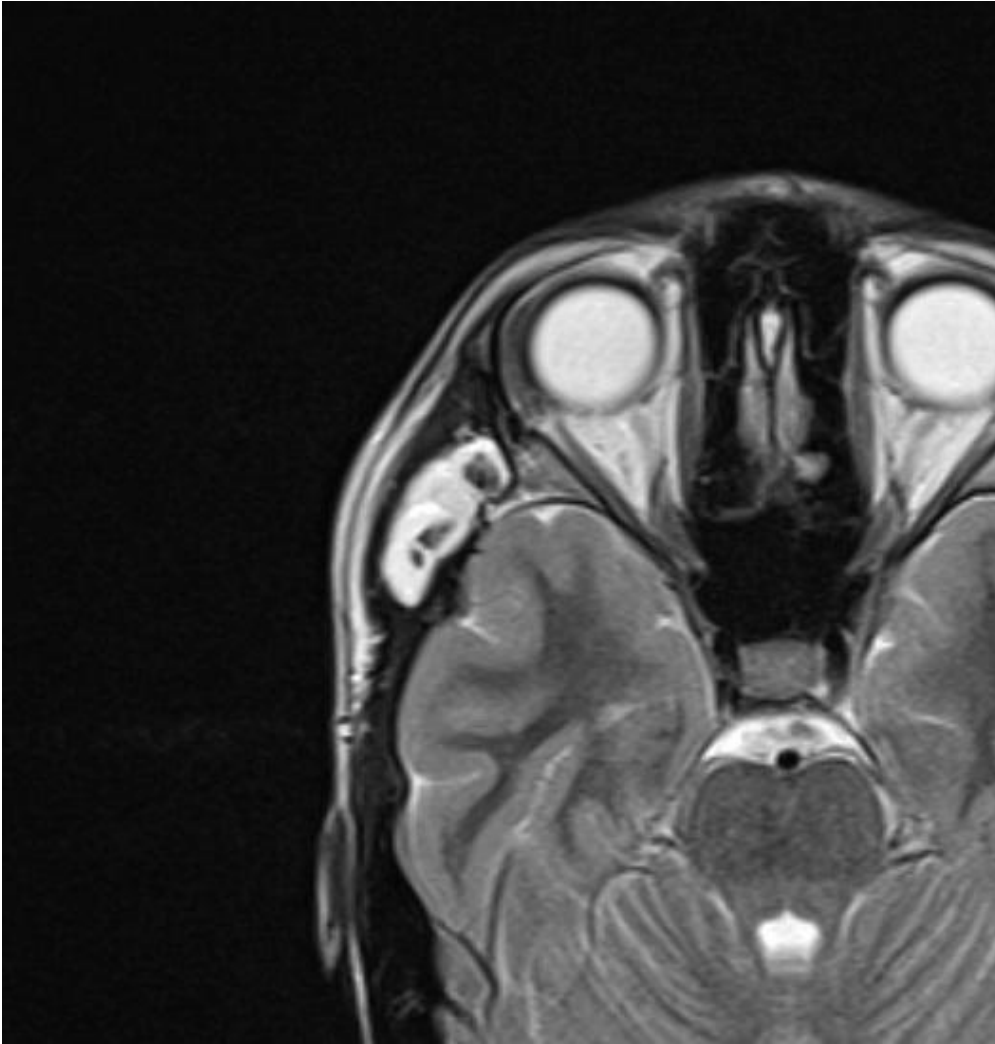
Final Diagnosis: Intramuscular common venous malformation.

References:

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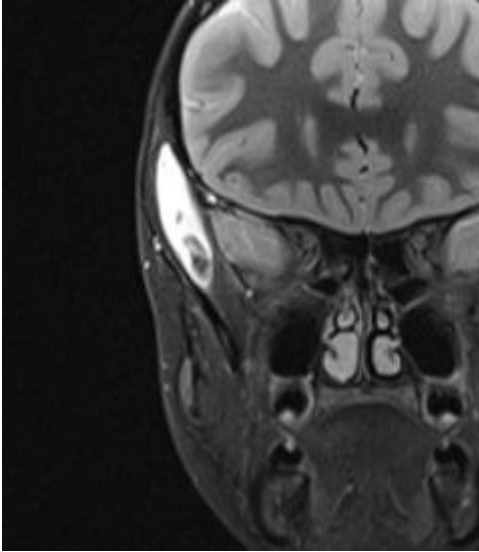
Figure 1

a



Description: T2 weighted (a) and (STIR) images (b) show well delineated hyperintense lesion with no surrounding edema and some small hypointense areas, consistent with calcifications (phleboliths) or hemorrhagic foci in the right temporal muscle. **Origin:** Avsenik J, Clinical Institute of Radiology, University Medical Centre Ljubljana, Slovenia

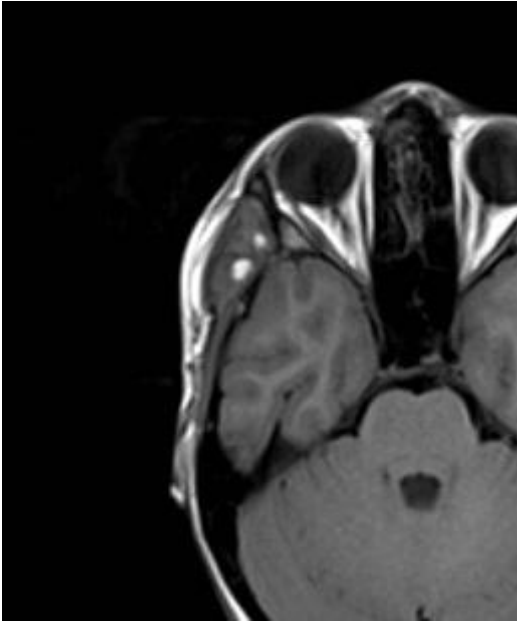
b



Description: T2 weighted (a) and (STIR) images (b) show well delineated hyperintense lesion with no surrounding edema and some small hypointense areas, consistent with calcifications (phleboliths) or hemorrhagic foci in the right temporal muscle. **Origin:** Avsenik J, Clinical Institute of Radiology, University Medical Centre Ljubljana, Slovenia

Figure 2

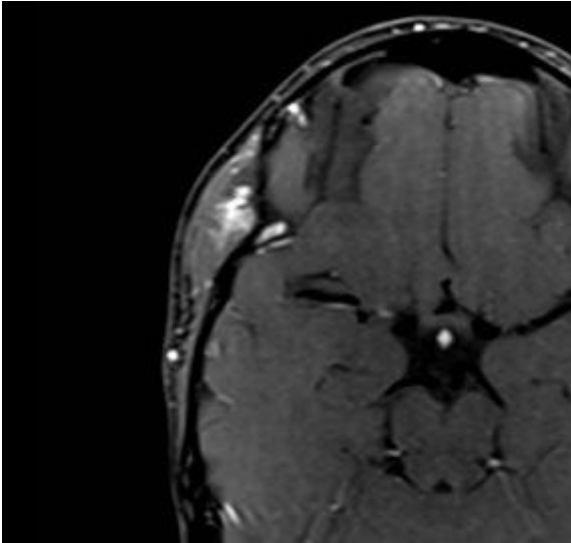
a



Description: T1 weighted image shows well delineated and slightly lobulated lesion in the right temporal muscle, isointense with skeletal muscle, with small hyperintense foci, consistent with calcifications (phleboliths) or small hemorrhagic foci. **Origin:** Avsenik J, Clinical Institute of Radiology, University Medical Centre Ljubljana, Slovenia

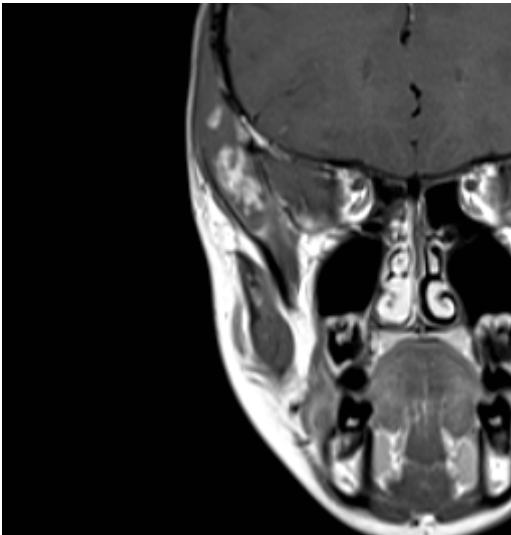
Figure 3

a



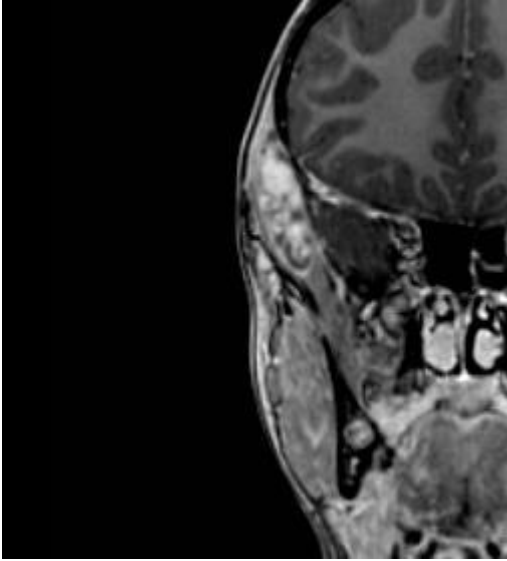
Description: Gradual filling of the lesion with contrast during the examination is shown on post-contrast images. **Origin:** Avsenik J, Clinical Institute of Radiology, University Medical Centre Ljubljana, Slovenia

b



Description: Gradual filling of the lesion with contrast during the examination is shown on post-contrast images. **Origin:** Avsenik J, Clinical Institute of Radiology, University Medical Centre Ljubljana, Slovenia

c



Description: Gradual filling of the lesion with contrast during the examination is shown on post-contrast images. **Origin:** Avsenik J, Clinical Institute of Radiology, University Medical Centre Ljubljana, Slovenia