Arteriovenous Malformation in Mandible

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Introduction

Arteriovenous malformations (AVM) are errors of avascular morphogenesis that are present at birth and become evident due to an event like trauma, surgery, infection, etc. The management of this condition in the maxillofacial region is difficult because of the abundant vascular network. One of the most common signs of these patients, especially in the mixed dentition period, is hyper mobility of the teeth with spontaneous haemorrhage from the surrounding gingival sulcus [1]. Mandibular AVM is a potentially life-threatening pathology requiring radical treatment.

Case History

A 14 year old boy reported to a dental centre with a complaint of mobility of Mandibular left 1st and 2nd molars since a couple of months. Clinical examination revealed a good periodontal condition with mobility of the teeth in question. The buccal cortical plate was intact while the lingual plate revealed areas of erosion.

As there was no obvious cause for the mobility, a diagnostic Ortho Pan Tomograph was taken. The radiograph revealed a diffuse radiolucency of the left mandible with clear-cut margins anteriorly in relation to the canine but with ill-defined border posteriorly in the retro molar region [2]. The two premolars and 2nd molar also showed signs of root resorption. The left Mandibular canal was larger than the right canal in size. The 3rd molar was impacted and pushed posteriorly.

A CT scan of the area confirmed an osteolytic lesion with buccal plate expansion and lingual plate thinning (Fig 1). A provisional diagnosis of dentigerous cyst ameloblastoma was made after reviewing all parameters. A significant clinical finding was an unusually prominent pulsation and bruit over the left facial artery giving rise to a doubt, whether this was a vascular lesion.

Diagnostic Angiography

Angiography is the corner stone of diagnosis of vascular lesions and shows the exact angioarchitecture of the lesion

and is essential for therapy planning. A transfemoral angiography of the left external carotid artery was performed and confirmed the diagnosis of high flow AV malformation involving the left facial, lingual and maxillary artery (Fig 2). MRI was also done to rule out soft tissue involvement of the lesion and confirm the limitation of the lesion within mandible. It was then decided to embolise the feeder vessels before surgically intervening. Embolisation of the facial, lingual and maxillary arteries were achieved using gel foam and poly vinyl alcohol and the occlusion confirmed by post embolisation angiography. Angiography of the contralateral side was also done to rule out any contralateral feeding of the lesion. Two days later the patient was to be taken up for resection of the lesion but a preoperative angiography revealed recanalisation of the vessels filling the lesion. Embolisation was again performed and the patient taken up for resection the next day. Hemimandibulectomy was performed and during the surgery profuse bleeding was encountered in spite of the embolisation cycles performed. An immediate reconstruction using iliac graft was done (Fig 3,4). The resected specimen showed complete erosion of the lingual plate with an abnormally wide mandibular foramen.

Discussion

Due to the potential danger to the patient in these lesions, surgical intervention has to be the choice of treatment in large lesions refractory to embolisation [3]. Traditional treatment has usually involved the obtaining of proximal and distal vascular control by transfemoral embolisation [4] followed by surgical removal of the lesion, when feasible. Various other conservative modalities of management are also in vogue. Workers have used intralesional occlusion [5] as an adjunct to arterial embolisation or in isolation with encouraging results, especially in intra osseous malformations [6].

Permanent embolic obliteration of the malformation requires placement of occlusive material directly into the nidus (core) of the lesion. Even optimal placement of arterial embolic material may fail to fully obliterate

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Fig. 1 : Coronal slice of mandible revealing osteolytic lesion left body

Fig. 3 : Immediate reconstruction with iliac bone graft

the nidus, allowing eventual restoration of flow to the lesion due to arterial recanalization. Under such circumstances it may be possible to obliterate the malformation and control lesional hemorrhage by occlusion of the malformation by direct percutaneous mandibular puncture.

Transvenous embolisation has been achieved using a variety of materials like Titanium microcoils, poly vinyl alcohol and gel foam [7]. Intra lesional material aiding in embolisation include sclerosing agents, n-butylcyanoacrylate and Ethibloc in conjunction with/without ivalon particles [8,9].

In our case hemimandibulectomy was the treatment of choice due to the extensive nature of the lesion. The case report underscores the limitations of therapeutic embolization and emphasizes the need for surgical removal of larger lesions.

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Fig. 2 : Angiography reveals the AV malformation with venous filling of pterygoid plexus

Fig. 4 : 3D CT view of the reconstructed mandible

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