

# Treatment of Pseudoaneurysm of Internal Maxillary Artery Resulting From Subcondylar Fracture

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**Abstract-** Aneurysm is a localized pathological dilation of a blood vessels. False aneurysm is discontinuity in the vascular wall leading to an extravascular hematoma that freely communicates with the intravascular space producing pulsatile hematoma. In false aneurysm wall is ruptured and there is collection of blood(hematoma) that is bounded externally by adherent extravascular tissue. However any vessel may be affected by a wide variety of disorders that weaken the wall , including trauma( traumatic aneurysm), infection ,congenital defects such as potentiating berry aneurysm.

Sporadic cases of false aneurysm following fractures of the facial bone have been reported but are few. aneurysm and pseudoaneurysm are complication of maxillo-facial trauma but sometimes occurs a result of isolated mandibular condylar fracture.

**Index Terms-** aneurysm, internal maxillary artery, sub-condylar fracture, trauma.

## I. INTRODUCTION

**I**nternal Maxillary Artery Pseudoaneurysm are rare events that may be caused as possible complication of trauma<sup>1,2,3,4</sup>, infection<sup>5</sup>, occurring as result of maxillomandibular surgery, therapeutic or diagnostic arterial wall needle puncture. More rarely, internal maxillary artery pseudoaneurysm may result from postradiation vasculopathy or tumor invasion.<sup>2</sup>

Most aneurysm of the internal maxillary artery occur in its terminal pterygopalatine segment, while it is very rare in the first or mandible segment of the internal maxillary artery as in our case.<sup>9</sup>

Research elaboration:-

A 23yr old male patient reported to the Out patient department with complain of swelling with throbbing pain in the right side of face in front of ear, following trauma due to fall on the point of the chin hitting a stone, a fortnight earlier from the date of presentation. There was some motor weakness in all the branches of the facial nerve of the affected site. Immediately following trauma patient was admitted to the dept of emergency surgery where some manoeuvre was done and details of which were unavailable and followed by facial nerve deficit. Patient was then discharged after 3 days with haemodynamic stability.

There was no history of unconsciousness ,altered sensorium ,vomiting after trauma.No history of bleeding from ear or nose after trauma.

Past medical and dental history didn't revealed anything significant.

On examination there was a swelling in right preauricular region, around 3-4 cm

Fig No.1



Fig No .2

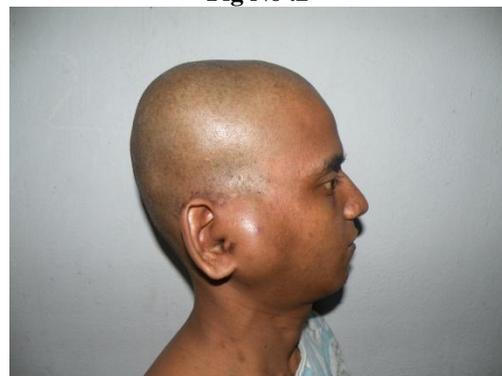


Fig No .3



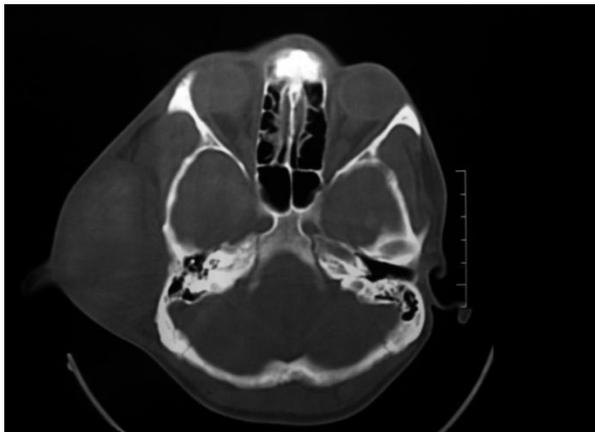
On palpation swelling was firm, tender and pulsatile with arterial bruits on auscultation which coincided with systole. (Vide Fig No .1 & 2)

There was facial nerve deficit of right side.

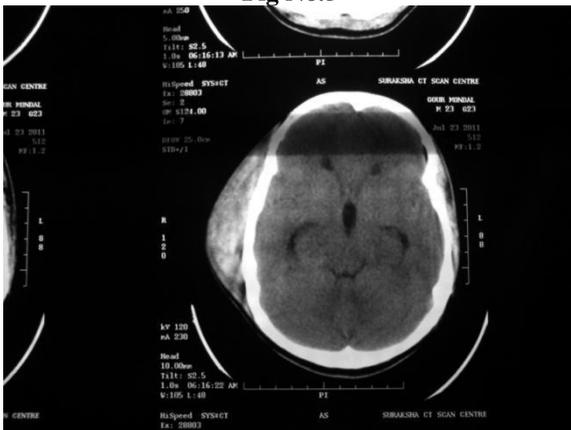
Mouth opening was restricted (Interincisal opening less than 20mm). (Vide Fig No .3) There was no deviation of mandible on mouth opening and no occlusal derangement.

Aspiration with wide bore needle yielded bright red blood.

**Fig No.4**

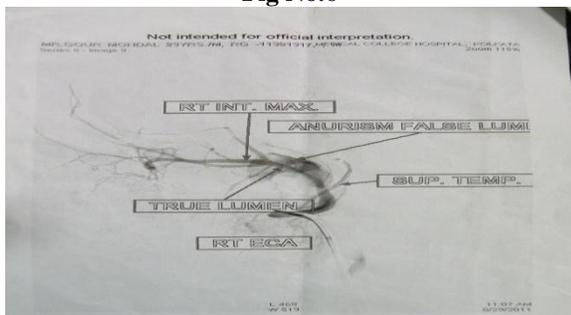


**Fig No.5**



A CT Scan of head showed hyperdense lesion in right preauricular region. The lesion emerged at the posterior border of the mandible (Vide Fig No .4 & 5)

**Fig No.6**



Angiogram was advised to the patient following CT Scan finding, which revealed pseudoaneurysm of Internal maxillary artery distal to bifurcation of External Carotid Artery into terminal branches-Superficial temporal artery & Internal maxillary artery. No other feeding vessel or collateral was seen. (Vide Fig No .6)

A treatment plan was chalked out as surgical excision of the aneurysmal sac after External Carotid artery ligation under GA via nasotracheal intubation.

An extended submandibular incision was given extending from anterior border of right sternocleidomastoid to submental region. Incision was deepened through skin, subcutaneous tissue, platysma. After blunt dissection through superficial layer of cervical fascia anterior border of sternocleidomastoid was exposed, which was retracted posteriorly. Following this posterior belly of digastric and stylohyoid retracted superiorly. Upper part of the carotid sheath was exposed. Bifurcation of the Common Carotid artery was exposed by dissection. External carotid artery was identified by its various branches it gives in the neck. External carotid artery was ligated above superior thyroid artery. (Vide Fig No .7)

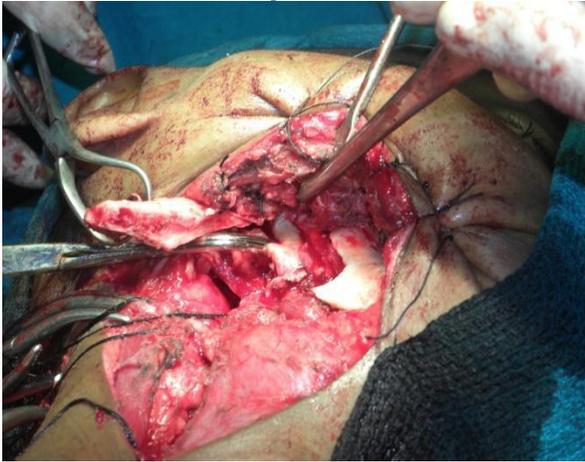
**Fig No.7**



Following ligation of ECA whole lateral surface of ramus with condyle was exposed by further dissection. Aneurysmal sac was seen lying over the lateral surface of ramus and condyle extending into the mass of the superficial lobe of the parotid gland.

To expose the deeper part of aneurysmal sac in total a vertical ramus access osteotomy was done and the proximal fragment was swung out laterally. (Vide Fig No .8) Once the sac was completely exposed it was dissected out taking extra care and meticulous sharp and blunt dissecting techniques. (Vide Fig No.10) Brisk haemorrhage started during the manoeuvre which was controlled by vascular clamps and ligation. A sharp fracture fragment was removed from medial part of the ramus (which, possibly, would have caused the puncture of the arterial wall).

**Fig No .8**



Final the osteotomised segment was fixed with a 6 hole mini plate and screws.

**Figure: 9**



**Fig No .10**



A vacuum drain was placed and wound closed in layers.(Vide Fig No .9)

Post operative pain ,oedema ,trismus subsided considerably within a couple of days.

Interventional physiotherapy by galvanic stimulation was used to facilitate nerve function recovery. Facial nerve deficit improved considerably.

## II. RESULTS AND DISCUSSION

Pseudoaneurysm is a rare clinical entity. Undiagnosed and Untreated it carries the risk of life threatening haemorrhage if the wall of the sac ruptures.

Presence of pulsatile sac with audible bruit coinciding with systole on clinical examination with the history of trauma should raise the suspicion of traumatic pseudoaneurysm and prompt for further evaluation through various investigations.<sup>10</sup> CT Scan and MRI can be valuable aid in diagnosis. USG and Colour Doppler can also be helpful investigation tool. But angiography remains the confirmatory<sup>10</sup> and most important diagnostic procedure with invaluable added benefit in treatment planning. Angiography may be combined with CT Scan or MRI. Angiography will confirm the location of aneurysm with its feeding vessel.<sup>11</sup>

After establishing the diagnosis, there are two treatment modalities to choose from-Endovascular therapy and Surgical management.<sup>12</sup>

Endovascular therapy is the primary treatment modality in many centres. The use of transcatheter intervention has improved access to surgically inaccessible vessels and has reduced the need for GA and Surgery and associated morbidity and mortality.<sup>13</sup>The added benefit of performing endovascular therapy during angiography has increased its use in trauma patients and as well as an adjunct prior to definitive surgical management.

Transcatheter interventions can be categorised into embolisation, stents, stent grafts.

Embolisation therapy involve the use of agents to occlude vessel lumen. There are numerous embolisation agents used like Gelfoam, isobutylcyanoacrylate, balloons,coils (made of Dacron or nylon fibres).<sup>11</sup>

Stents and stent grafts have advantage that they maintain the patency of vessel lumen.<sup>14,15</sup> However the presence of extensive collateral between vessels of the right side and left side of the face & various anastomosis between internal & external carotid artery, the embolisation or surgical ligation of external carotid artery does not cause any clinical significant compromise of blood supply to the peripheral tissues.

Endovascular therapy though a very attractive & modern approach, is not without certain disadvantages.

Endovascular therapy requires skilled & experienced interventional radiologist to perform the procedure. The various collaterals between branches of external & internal carotid artery may result in embolus being passed into branches of internal carotid artery with dangerous complications.<sup>16,17</sup>

The arterial wall may get punctured during transcatheterisation causing brisk haemorrhage. Moreover embolisation with coils may not occlude the large aneurysmal sac completely.

Surgical management remains the gold standard of treatment, especially for large aneurysm and when non invasive approach fails. Moreover the lack of infrastructure and skilled expertise may favour the choice of surgical management.

### III. CONCLUSION

Treatment planning of traumatic aneurysm of internal maxillary artery thus needs proper decision making through a team work involving surgeons & interventional radiologists.

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