



## Pseudoaneurysm of the Facial Artery Following Bilateral Temporomandibular Joint Replacement: A Case Report

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### Abstract

**Introduction:** Pseudoaneurysm of the facial artery is a rare event. Rupture of the arterial wall leads to extravasation of blood into the surrounding tissue, followed by tamponade and clot formation. Left untreated this has the potential to cause catastrophic haemorrhage.

**Case Report:** A 59-year-old male presented to our department with bony ankylosis of his temporomandibular joints bilaterally as a result of previous osteomyelitis. He underwent bilateral temporomandibular joint replacements in a two-stage procedure. Following his discharge he presented to the emergency department six weeks later in haemorrhagic shock, having lost significant blood volume from a pulsatile lesion over his right mandible. Computed tomography angiography revealed a pseudoaneurysm of the right facial artery. He proceeded to emergent embolisation with resolution of the pseudoaneurysm.

### Introduction

Aneurysms are defined as abnormal and local dilatations of blood vessel walls. They can be classified as either true or false. In a true aneurysm all three layers of the affected blood vessel are involved: intima, media and adventitia [1]. A false aneurysm, or pseudoaneurysm, is a collection of blood leaking completely out of an artery, but confined next to the vessel by the surrounding tissue [2].

Pseudoaneurysms are caused by the partial rupture of an artery, followed by the extravasation of blood into the surrounding tissue. This leads to haematoma formation that tamponades the arterial flow. The structure of the haematoma begins to organise and an endothelial lining forms around the periphery [3]. Following liquefaction of the haematoma, the aneurysmal sac and artery communicate, forming a pulsatile mass. This mass may gradually expand and is at risk of rupture, which can lead to life threatening haemorrhage [2,4]. Pseudoaneurysms usually show a delayed occurrence, presenting weeks or months after the precipitating event [3,5,6].

We present a case of a pseudoaneurysm of the right facial artery that occurred in the weeks following bilateral temporomandibular joint (TMJ) replacement surgery. To the author's knowledge this has not been reported in the literature to date.

### Case Presentation

A 59 year old male was referred to the Oral and Maxillofacial Surgery (OMFS) Department for evaluation and management of his complete trismus. He had immigrated to New Zealand six months prior from Africa. Approximately 10 years ago he suffered widespread mandibular osteomyelitis, which was treated with intra-venous penicillin over many months. Prior to this, his mouth opening was normal.

On examination, the patient was micrognathic, with a retruded chin and atrophied masseter muscles. He had tethering of the skin over the body of the mandible bilaterally. Computed Tomography (CT) showed bony fusion of both the left and right mandibular condyles to their respective glenoid fossa.

Following biopsy of his condyles to ensure the osteomyelitis had completely resolved, he underwent two-stage bilateral TMJ replacement surgery. After initial resection of the bony ankylosis and placement of temporary spacers, he proceeded to placement of bilateral artificial temporomandibular (TM) joints.

Following TMJ replacement surgery, the patient recovered well without complication and was

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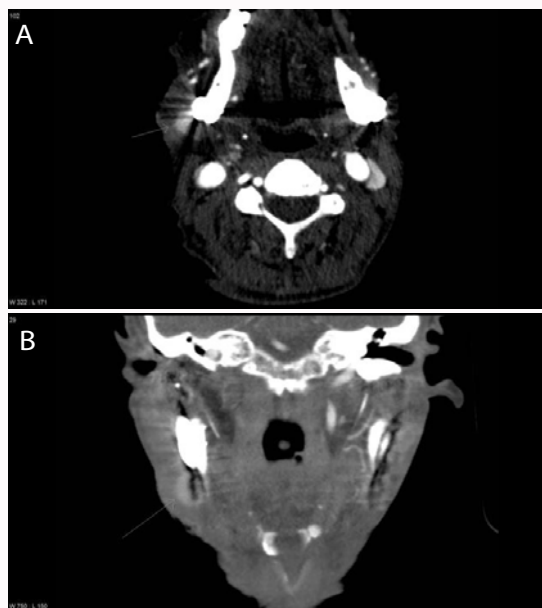
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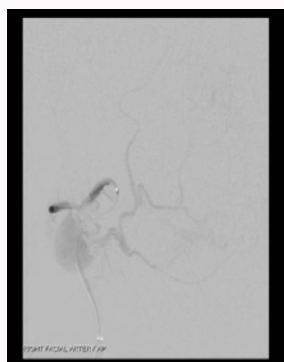
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**Figure 1:** A) CTA of Right Facial Artery Pseudoaneurysm, Axial view. B) Coronal View.

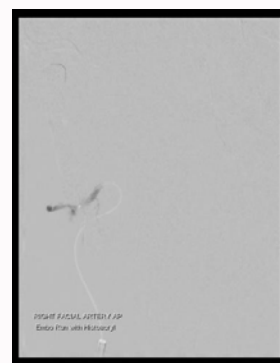


**Figure 2:** Placement of microcatheter prior to embolisation.

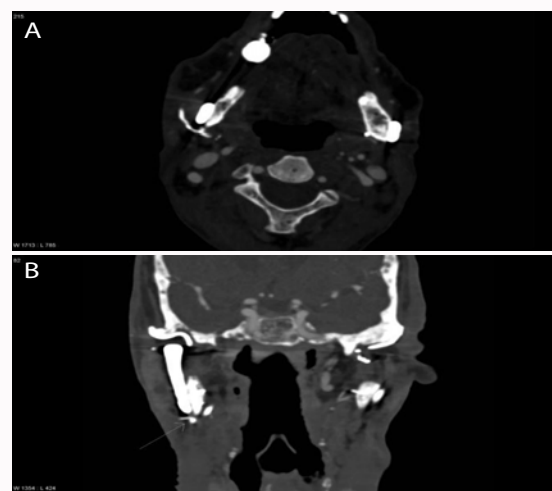
discharged home. He was reviewed two weeks following the surgery where he was noted to have developed a haematoma over his right submandibular wound (site of surgical access). There was no sign of infection, but was causing the patient discomfort. At the time, under local anaesthetic, this haematoma was partially evacuated. Upon review the following week, this area was much more comfortable, and at further review at two weeks it continued to improve, but had not resolved completely.

Approximately two weeks after his last review (six weeks since the initial surgery) he presented to the Emergency Department (ED) in hemorrhagic shock. He had sustained a severe bleed from a pulsatile lesion in the right submandibular region. Intra oral examination was unremarkable. His haemoglobin on arrival was 59 g/L and blood pressure 90/51 mmHg. Blood tests showed prothrombin time (PT) and activated partial thromboplastin time (APTT) were within normal limits.

Following resuscitation with normal saline and two units of red blood cells he was stabilized and direct pressure over the lesion had stopped the bleed. A computed tomography arteriogram (CTA) was arranged urgently. This showed a large pseudoaneurysm of the right facial artery, lying superficial to the right TMJ replacement, with the



**Figure 3:** Embolisation of distal and proximal ends of pseudoaneurysm.



**Figure 4:** A) Postoperative follow up CTA (axial view) shows resolution of the pseudoaneurysm. B) Coronal View.

arterial defect lying posterior to the point of attachment at the ramus of the mandible (Figure 1 A and B ).

Endovascular embolisation was arranged and a microcatheter was passed through the base of the aneurysm to the exit point of the facial artery from the aneurysm. (Figure 2) A tissue adhesive (75% histocryl/lipiodol/tantalum) was injected, closing the facial artery both proximal and distal to the aneurysm, and closing the defect in the artery without filling the bulk of the aneurysm (Figure 3). Follow up CTA was performed that showed resolution of the pseudoaneurysm (Figure 4 A and B). The patient made a successful recovery, and has had no recurrence or complications from the treatment after one year of follow up.

## Discussion

Pseudoaneurysms of the branches of the external carotid artery are extremely rare [2,6]. The soft tissues and bones of the face protect these branches, but in regions where they surface and cross bone structures, they become vulnerable to damage [5]. Pseudoaneurysm of the facial artery has been noted to occur following maxillofacial trauma [2,5], orthognathic surgery [3,6,7], surgical removal of molar teeth [8], and odontogenic infection [9]. The most dangerous complication of a pseudoaneurysm in this region is catastrophic haemorrhage following rupture. Other complications include compression of adjacent neurovascular structures, and release of embolic thrombi. In this case pseudoaneurysm of the facial artery presented clinically as a

painless, pulsatile lesion in the right submandibular region. Clinical findings such as pulsations or a bruit suggest a vascular aetiology [10,11]. CTA is the investigation of choice in these situations, as it can assess the patency and position of the branches of the ECA, as well as delineating the anatomic details of the Pseudoaneurysm [2,4]. The consensus amongst the literature is that embolisation through interventional radiology of the aneurysm is safest and most effective treatment method [3,7]. Treatment is essentially mandatory, given the unstable nature of pseudoaneurysms, and the potentially devastating consequences of rupture.

This case highlights the importance of prompt evaluation and treatment of pseudoaneurysms of the facial artery. It is important to ensure adequate postoperative follow up after surgery to the region as pseudoaneurysms have a delayed presentation.

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