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## Traumatic Pseudoaneurysm of Internal Maxillary Artery: A Case Report

Pseudoaneurysm of the internal maxillary artery (IMPA) is rare. We presented a 5-year-old girl with a mass in the right parotid area, one week after trauma. It was increasing progressively in size. Doppler sonography, computed tomography (CT), angiography and observation during surgery revealed pseudoaneurysm of the internal maxillary artery.

**Keywords:** Internal Maxillary Artery, Pseudoaneurysm, Trauma

### Introduction

Pseudoaneurysm (PA), also known as a false aneurysm, is an out-pouching of a blood vessel, with actual disruption of one or more layers of its wall.<sup>1</sup> Internal maxillary artery pseudoaneurysm (IMPA) is rare,<sup>1-3</sup> and usually results from direct penetrating or blunt trauma.<sup>4</sup> In one study, 3 patients and in another study, 11 patients with IMPA have been reported.<sup>1-5</sup> Unrupture IMPAs may also present as an expanding, pulsatile mass, often with an audible bruit.<sup>1</sup> We report a case with traumatic pseudoaneurysm of the internal maxillary artery in a young girl.

### Case Presentation

A 5-year-old Iranian girl with a right facial mass was admitted 3 weeks after penetrating trauma. Her mother stated that the girl had been playing, suddenly she fell down and the knife, cut the right side of her face followed by severe bleeding. After one week, the mass appeared from the wound, progressively increasing in size. She received antibiotics but she had no response. Therefore, she was referred to our hospital for more evaluation. The mass was firm, painful, pulsatile and 5-cm in diameter in the right parotid area. She had no fever. The laboratory data were normal. Computed tomography (CT) was performed and a large hypodense mass was revealed in the right parotid (Fig 1). Color Doppler ultra sonography revealed the arterial flow. Spectral Doppler image from the pseudoaneurysm showed the characteristic to-and-fro flow pattern (Fig 2). Finally, the right lateral carotid angiogram revealed a pseudoaneurysm in the internal maxillary artery (Fig 3).

We could not employ embolization for her treatment because we had no facilities back then. In addition to angiography, observation during operation established the site of the pseudoaneurysm. During operation, the pre-auricular and retro-mandibular approach changed to the retromolar approach because of massive bleeding and depth of the mass. Successful operative repair of the aneurysm was performed. The postoperative course was uneventful and she was discharged



**Fig.1.** A and B. Axial view contrast-enhanced CT scan of the neck of a 5-year-old girl. There is a soft tissue density lateral to the right mandibular ramus (35×25 mm) large central enhancement (arterial phase) which suggests pseudoaneurysm (thin arrow). Also there is another soft tissue medial to the right mandibular ramus without enhancement which suggests hematoma (thick arrow).

one week after the operation. No sequels were recognized at the follow up examination 2 months after surgery.

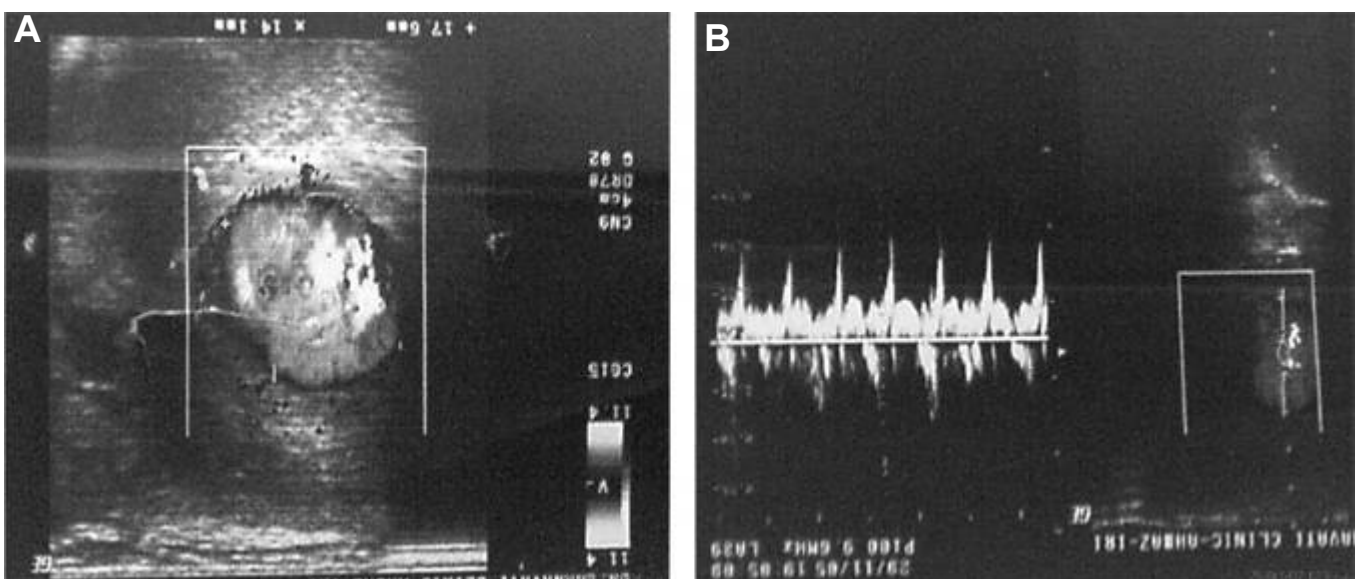
### Discussion

False arterial aneurysms or pseudoaneurysms are caused by injuries that rupture the full thickness of the arterial wall leading to extravasation of blood into the surrounding tissue, producing a pulsating hematoma. The perivascular connective tissue forms a gradually expanding sac of the false aneurysm which

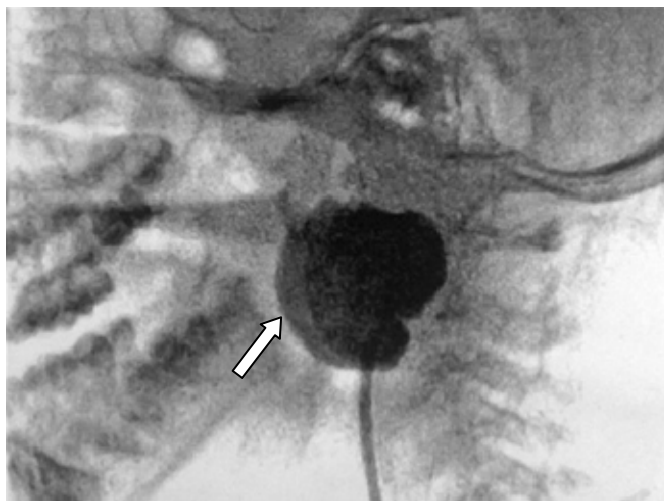
may rupture, producing life-threatening hemorrhage.<sup>6</sup> Internal maxillary artery pseudoaneurysm (IMPA) usually results from direct penetrating or blunt trauma.<sup>4</sup> The internal maxillary artery (IMA) is the largest terminal branch of the external carotid artery.<sup>1</sup>

IMPAs are rare events, documented as a possible complication of trauma,<sup>2,7</sup> infection or occurring as a result of maxillomandibular surgery.<sup>3</sup>

Regarding the interval between trauma and occurrence of the pseudoaneurysm, our case was almost



**Fig. 2.** A. Color Doppler ultrasonography reveals the arterial flow. B. Spectral Doppler image from the pseudoaneurysm shows the characteristic to-and-fro flow pattern.



**Fig. 3.** Right lateral carotid angiogram reveals a pseudoaneurysm in the internal maxillary artery.

similar to a study in which pseudoaneurysm of the patient occurred 17 days after a gunshot wound to the back of the neck.<sup>5</sup>

Color Doppler sonography was used to locate the aneurysm sac and establish its relation to the adjacent facial artery.<sup>4</sup> CT has been used to evaluate the extension of the maxillofacial trauma. Although the diagnosis of IMPA depends solely on catheter angiography, on occasion, CT can directly visualize IMPAs larger than 1 cm. In most instances, precise detection of IMPA is difficult, especially when it is small or obscured by hematoma. However, CT remains helpful in managing IMPA.<sup>1</sup> Without careful evaluation in the primary care setting, pseudoaneurysm can be easily misdiagnosed and improperly managed.<sup>8</sup> IMPAs may lead to different complications and clinical manifestations, such as life-threatening hemorrhage following rupture, compression of the adjacent artery or nerves and gradual or abrupt increase in size.<sup>9</sup> Studies have shown that as many as 89% of untreated pseudoaneurysms resolve in 5 to 90 days.<sup>10</sup>

Endovascular embolization can succeed in managing IMPAs. A study revealed that endovascular

treatment was technically successful in all 11 IMPAs, causing hemorrhage immediately after embolization at that time.<sup>1</sup> In our patient, embolization was not performed because of no existing facilities. In one study, an angiography confirmed a ruptured pseudoaneurysm of the left internal maxillary artery that was similar to our study.<sup>6</sup> The surgical approach in the management of pseudoaneurysms is proximal and distal control of the internal maxillary artery bleeding by ligating the external carotid artery and its branches and trans-antral clipping of the third portion of the maxillary artery in the same sitting. Resection of the false aneurysm sac should only be performed if it could be carried out safely.<sup>6</sup>

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