

Traumatic Pseudoaneurysm: A Life-Threatening Complication After Surgical Extraction of Impacted Maxillary Third Molar

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Abstract Pseudoaneurysms are rare lesions secondary to blunt or penetrating trauma, temporomandibular joint surgery, or orthognathic surgery. They are usually produced by arterial breach leading to extravasation of blood. The compressed perivascular tissue forms the wall of aneurysmal sac. This sac gradually expands and can be damaged. Nonsurgical interventions are the treatment of choice for pseudoaneurysms. In the case reported here, emergent endovascular injection of acrylic glue was successful in the treatment of a pseudoaneurysm from a branch of the internal maxillary artery secondary to surgical extraction of impacted maxillary third molar.

Keywords Pseudoaneurysm · Surgical extraction · Internal maxillary artery · Angiography · Embolization

Introduction

A pseudoaneurysm is an extravascular hematoma that communicates with the intravascular space. It's name is derived from the fact that it's vascular wall is composed of fibrous connective tissue (pseudocapsule) that develops following rupture of the endothelium [1]. If the inelasticity of the surrounding tissues allows a compressive effect,

bleeding can be counterbalanced by this compressive action, leading to formation of a hematoma [2]. This pulsating liquefied hematoma develops for 1–8 weeks and forms a new vascular wall that can rupture and trigger severe hemorrhage or thromboembolism.

Arteriography is the standard procedure to identify pseudoaneurysms in the maxillofacial region. Nonsurgical interventions are the choice of treatment for this lesion. Treatment can be achieved by interventional radiology through a selective embolization of the vessel with excellent outcomes. We report a case of traumatic pseudoaneurysm following surgical extraction of impacted maxillary third molar and emergent embolization was done using acrylic glue.

Case Report

A 24-year-old male was referred for removal of impacted maxillary third molars (Fig. 1) from Department of Orthodontics, Government Dental College, Thiruvananthapuram prior to fixed appliance therapy. Surgical extraction of impacted maxillary right third molar was done under local anesthesia. Intra-operative oro-antral communication was noted. Primary closure was achieved after hemostasis with 3-0 Vicryl.

On 7th day, patient reported with spontaneous fresh bleeding from right nostril. Anterior nasal pack was given, and he was kept under observation for 24 h.

Patient reported again with the same complaint after 1 week. Routine blood investigations showed an alarming fall in hemoglobin level (14–10.5 gm%). Emergency CT-scan maxilla showed—hemosinus and a defect in posterolateral wall of right maxillary sinus (Fig. 2).

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Fig. 1 Impacted maxillary third molars

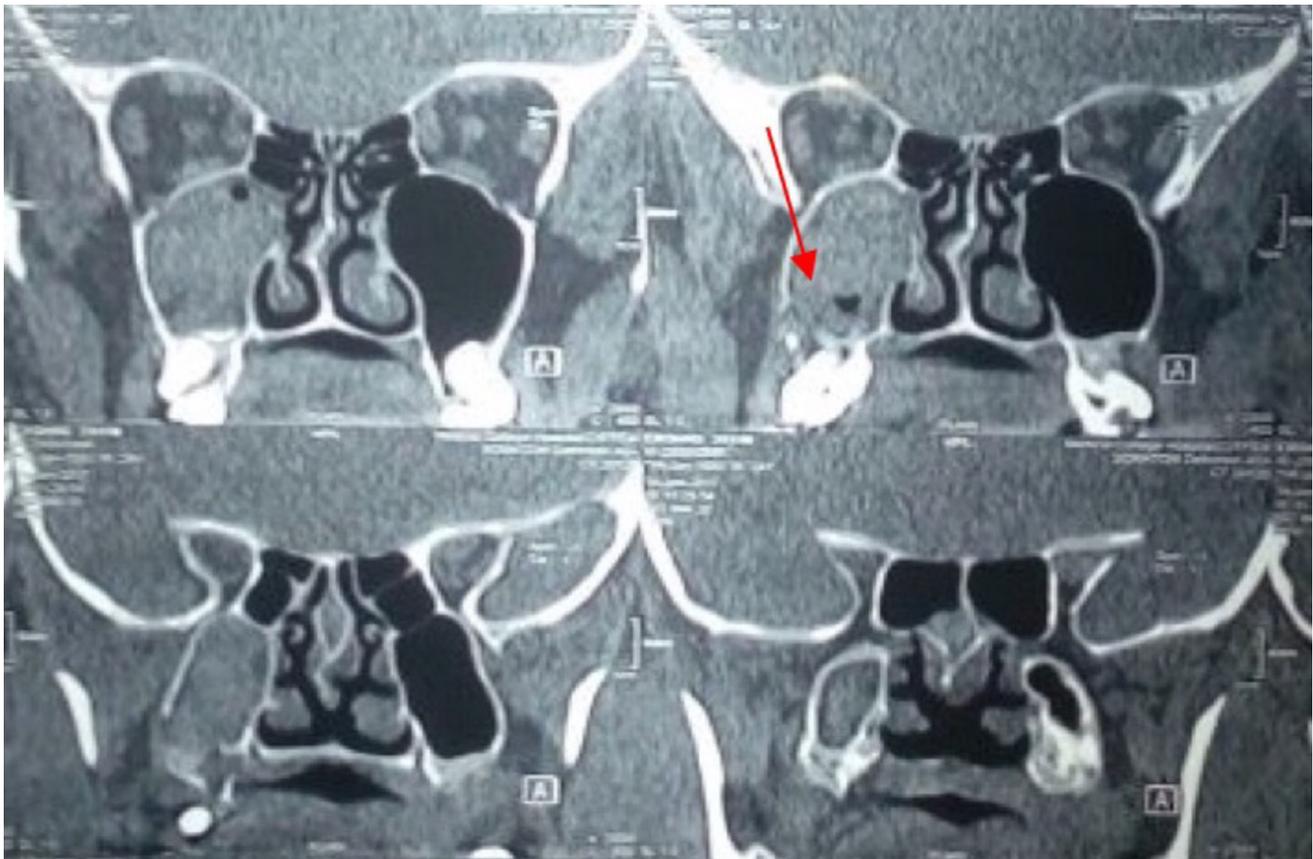


Fig. 2 Defect in maxillary sinus wall

The patient was referred to Department of Interventional Radiology, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram for angiography. DSA (Digital Subtraction Angiography) showed a

small 5×5 mm. Pseudoaneurysm is in the right maxilla corresponding to the region of dental extraction (Fig. 3).

Embolization of the pseudoaneurysm was attempted with 1 ml of 25% NBCA (n-butyl cyanoacrylate) in

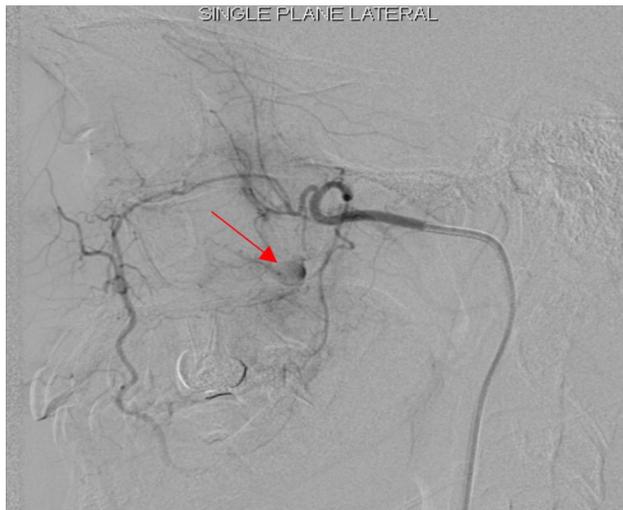


Fig. 3 Pseudoaneurysm from a branch of IMA

internal maxillary artery. No complications were noted after the embolization procedure.

There were no further episodes of bleeding; hence, he was discharged after a week with hemoglobin level of 11.0 gm%.

Discussion

Pseudoaneurysms (PA) are usually secondary to blunt or penetrating trauma, temporomandibular joint surgery, or orthognathic surgery [3]. Because of deep location of maxillary artery (MA), hemorrhage can be difficult to manage. The mandibular portion of maxillary artery is close to the mandibular condyle. It's mean distance from the neck of the condyle is approximately 6.8 mm. Condylar fractures are one of the principle causes of MA lesions [4].

The life-threatening pseudoaneurysm of the facial artery after dental extraction has been reported by Enrique Marco de Lucas et al. [5] and successful treatment with emergent endovascular embolization was attempted.

Farshid Rayati [6] reported that removing wisdom teeth can damage the facial artery wall which can cause a pseudoaneurysm due to blood flowing and staying in surrounding tissues. Osteotomy during pterygomaxillary separation risks injury to the IMA (internal maxillary artery) and branches at this juncture [7].

Contrast-enhanced CT and catheter angiography are the gold standard in diagnosing a pseudoaneurysm of the IMA [8]. Treatment for these lesions includes various surgical and endovascular options. Catheter-based embolization is a safe, quick, and effective technique, and it avoids the morbidity of an extensive surgical exposure. Endovascular approach involves either the use of materials to occlude

vessel lumen or the placement of a stent. Numerous agents have been used for the embolization therapy such as metallic coils, polyvinyl alcohol particles, n-butyl cyanoacrylate (NBCA), polymers (Onyx, SQUID), and absorbable sponge gel [9].

Takeshita et al. analyzed series on traumatic IMA pseudoaneurysms treated with endovascular therapy. They reported that the most common embolization agents used are metallic coils (40%), particles (28%), and NBCA (24%). NBCA was the most appropriate embolic material for the PA because embolization is completed more quickly compared to other agents, the primary hemostasis rate is higher and the recurrent hemorrhage rate is lower [10].

Acute complications of endovascular treatment are distal thromboembolic events (occlusion of the central retinal artery, facial palsy, stroke due to potential anastomosis between the IMA and the ophthalmic artery) and local tissue infarct. Thus, it is mandatory to know the anastomosis between the external carotid artery and the internal carotid artery.

Conclusion

In summary, our patient underwent successful embolization of a IMA pseudoaneurysm following surgical extraction of impacted maxillary third molar. This complication can be life threatening if not diagnosed and treated soon. We recommend maintaining a level of suspicion for occult vascular injuries in patients with recurrent nasal bleeding episodes after such procedures even beyond the perioperative period.

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