



CASE REPORT

Traumatic Pseudoaneurysm of Internal Carotid Artery presenting as Intractable Epistaxis in a Case of Maxillary Fracture

¹Dinesh Kumar, ²Gyana Ranjan Sahu, ³Ajay Kumar, ⁴KK Mukherjee, ⁵Vidya Rattan

ABSTRACT

Traumatic pseudoaneurysm of internal carotid artery is a rare complication of injury after craniomaxillofacial trauma. Delayed recurrent epistaxis after head and facial trauma is the most distinctive manifestation of traumatic internal carotid artery pseudoaneurysm. Epistaxis due to pseudoaneurysm of internal carotid artery is difficult to control, and may lead to hemorrhagic shock or asphyxia and thus seriously threatens life. The purpose of this paper is to present a rare case of recurrent epistaxis secondary to ICA pseudoaneurysm following blunt maxillofacial trauma. Endovascular stenting was performed and the recurrent epistaxis was successfully arrested.

Keywords: Epistaxis, Pseudoaneurysm, Internal carotid artery, Endovascular stent.

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INTRODUCTION

Pseudoaneurysm, 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.¹ Traumatic internal carotid artery (ICA) pseudoaneurysm is rare complication of blunt craniofacial trauma, with a reported incidence approximately 1% of all blunt trauma.² Internal carotid artery pseudoaneurysm is a rare and potentially fatal cause of epistaxis that demands prompt recognition. Although a majority of ICA pseudoaneurysms are

associated with trauma or infection, cases associated with pregnancy, iatrogenic injury, tumor invasion, and radiotherapy have also been reported. Recurrent epistaxis following blunt craniofacial trauma should alert clinicians to the possibility of traumatic (ICA) pseudoaneurysm. Endovascular intervention of ICA pseudoaneurysm is the treatment of choice in managing such cases. The purpose of this paper is to present a rare case of recurrent epistaxis secondary to ICA pseudoaneurysm following blunt maxillofacial trauma.

CASE REPORT

A 21-years-old female suffered from injury due to road traffic accident in September 2013. She reported to the oral and maxillofacial surgery unit with complaints of swelling on face, inability to chew and restricted mouth opening. The patient reported oronasal bleeding and vomiting after trauma but had no history of unconsciousness and altered sensorium. On palpation, step and tenderness at left infraorbital rim and mobility at Le Fort I level was present. Diagnosis of fracture left zygomatic complex and bilateral Le Fort I maxilla was confirmed with a computed tomography scan of head and face (Figs 1A and B) with no other abnormal finding.

The patient underwent open reduction and internal fixation with titanium miniplates for the fractured maxilla under general anesthesia. She was discharged after 2 days without any complications. The patient was followed up on seventh day after operation and sutures were removed.

The patient reported on eleventh postoperative day with complaint of bleeding from left nostril and was admitted in hospital for observation. During the 2 days hospital stay, there was no episode of epistaxis and she was discharged. On fifteenth postoperative day, she reported again in the emergency unit with epistaxis. On endoscopic examination by ear, nose, throat surgeon no active bleeding point in the nasopharynx was detected. She was kept under observation for 3 days during which there was no episode of epistaxis and hence was discharged.

On twenty third postoperative day, the patient again reported with complaint of epistaxis. A CT angiogram

¹Senior Resident, ²Junior Resident, ³Assistant Professor
^{4,5}Additional Professor

^{1,2,5}Department of Oral Health Sciences, Postgraduate Institute of Medical Education and Research, Chandigarh, India

³Department of Radiology, Postgraduate Institute of Medical Education and Research, Chandigarh, India

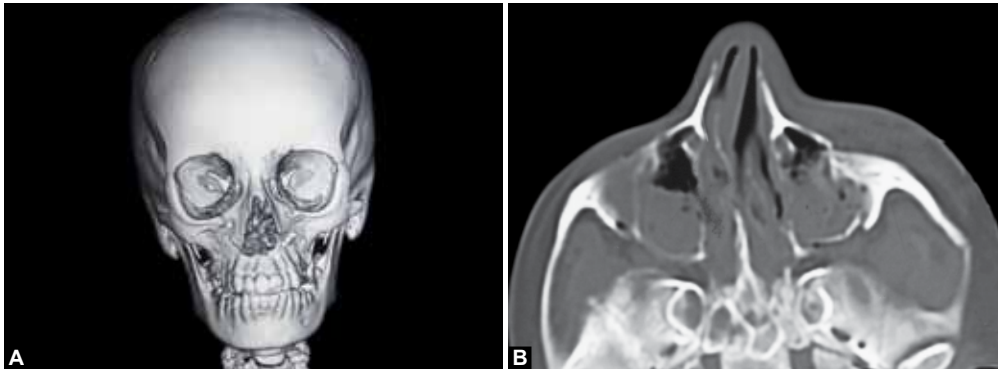
⁴Department of Neurosurgery, Postgraduate Institute of Medical Education and Research, Chandigarh, India

Corresponding Author: Dinesh Kumar, Senior Resident Department of Oral Health Sciences, Postgraduate Institute of Medical Education and Research, Chandigarh, India, Phone: 01722756261, e-mail: dr_dinesh78@yahoo.com

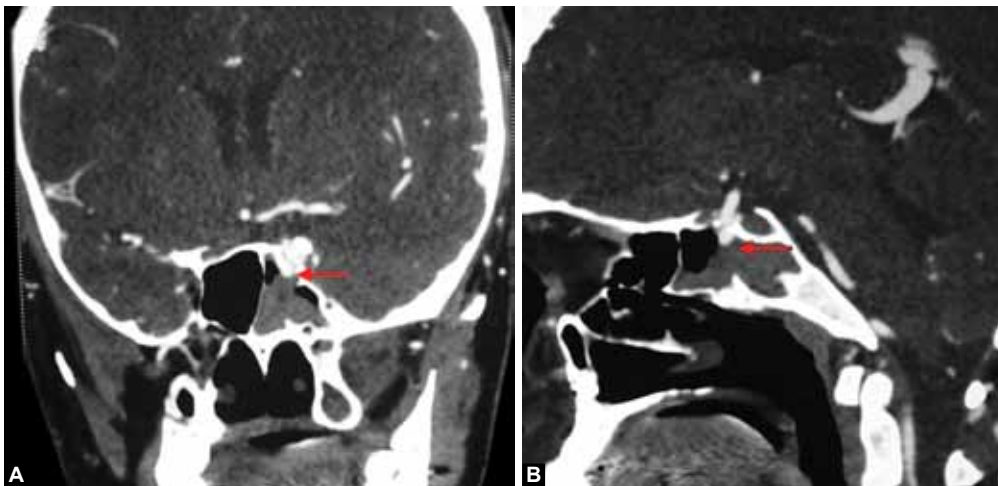
was performed which revealed pseudoaneurysm of left internal carotid artery (Figs 2A and B). After a neurosurgery consultation, the intervention radiologist performed digital subtraction angiography of the carotid artery. Its findings confirmed that there were two traumatic pseudoaneurysm arising from cavernous segment (C4/C3 segment) of left internal carotid

artery, larger measuring approx. 4.4×3 mm directed anteroinferiorly and smaller located posteromedially measuring approx. 3.5×2 mm in size (Fig. 3).

Due to repeated epistaxis episodes the patient's hemoglobin level had reduced from 13.2 gm/dl to 5.9 gm/dl and for the same 2 units of packed red cells were transfused. On twenty-fifth postoperative day,



Figs 1A and B: Computerized tomographic scan showing Le Fort I fracture of maxilla and inferiorly displaced left zygomatic complex: (A) 3D reconstruction and (B) axial cut



Figs 2A and B: Computed tomography angiography coronal and sagittal reformatted images shows, pseudoaneurysms of left internal carotid artery arising from cavernous segment (arrows), larger directed anteroinferiorly and smaller posteromedially

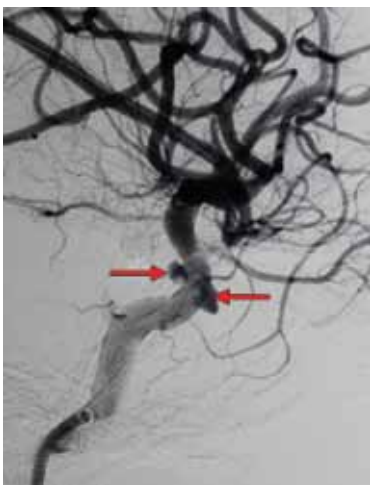


Fig. 3: The internal carotid angiogram reveals pseudoaneurysm (arrows) in the region of cavernous internal carotid artery

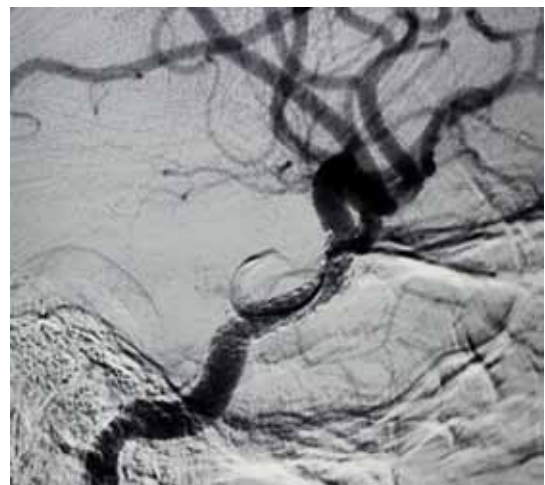


Fig. 4: Poststent graft placement shows complete nonopacification of the pseudoaneurysm with patent internal carotid artery lumen

the left internal carotid artery pseudoaneurysm stenting was performed under general anesthesia using an aneurysm of 3.5 × 23 mm (Fig. 4) without any intra-operative complication. Postoperatively, the patient was put on oral anticoagulant therapy. Angiography done at 1 month post-stenting showed patency of the stent and nonopacification of pseudoaneurysm. The patient has been symptom free at her sixth months follow-up.

DISCUSSION

An aneurysm is an abnormal widening or ballooning of a portion of an artery due to weakness in the wall of the blood vessel. A true aneurysm is one that involves all three layers of the wall of an artery (media, intima, and adventitia). A pseudoaneurysm, or false aneurysm, occurs as the result of a leaking hole in a blood vessel. Traumatic pseudoaneurysm of the ICA pathogenesis involves partial vessel transection and formation of a hematoma. The bleeding stops with counter pressure of the hematoma. The unclotted portion of the hematoma located around the injured wall is filled by circulating blood in continuity with the arterial lumen. The hematoma liquefies in around 1 week and may re-bleed. The blood causes an inflammatory reaction in surrounding tissue with the formation of a fibrous capsular wall and development of an epithelial lining. Continuous pulsatile forces can result in enlargement, weakening, and breakdown of the fibrous wall,³⁻⁵ which cause repeated bleeding. Patients with traumatic internal carotid artery pseudoaneurysm present with repeated epistaxis that is difficult to control, a condition that often leads to hemorrhagic shock or asphyxia and thus seriously threatens life.

Pseudoaneurysms are uncommon in the maxillo-facial region and usually result from blunt or penetrating injury, or surgical trauma.⁶ Iatrogenic pseudoaneurysm of ICA have been reported following maxillary osteotomies due to excessive force applied during mobilization of maxilla and fracture line traversing along the base of skull. The present patient possibly had developed pseudoaneurysm following road traffic trauma, as minimal manipulation was done during fixation of maxillary fracture, as it was minimally displaced. Traumatic pseudoaneurysms located near the skull base are hazardous to approach and challenging to repair.⁷ In

the past, surgical treatment of ICA pseudoaneurysms has been the preferred approach,^{8,9} however, the close proximity to the skull base makes repair difficult. The development of endovascular techniques now provides a feasible alternative to direct surgical repair for vascular injuries of the ICA near the skull base.^{7,10} Our patient underwent a successful endovascular treatment of an ICA pseudoaneurysm.

CONCLUSION

Following blunt craniofacial trauma, delayed onset epistaxis should alert the clinician to possible traumatic internal carotid artery injury and angiography should be done to rule out pseudoaneurysm. Early diagnosis and treatment of ICA pseudoaneurysm is essential to minimize morbidity and mortality.

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