

Cervical internal carotid artery pseudoaneurysm following stab injury

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ABSTRACT

Carotid artery pseudoaneurysm is a rare complication of injury to the head and neck, which has been traditionally managed by an open surgical repair to avoid the occurrence of devastating cerebral strokes. Their treatment presents a challenge because of the risk of serious neurological events. This report presents a case of a stab penetrating injury to the left upper neck (Monson's zone-III), which resulted in ipsilateral seventh and twelfth cranial nerve palsy and contra lateral hemiparesis, and false aneurysm of the internal carotid artery. After excision of the aneurysm, the internal carotid artery was ligated. The postoperative course was uneventful, and the patient remains free of symptoms.

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Carotid artery false aneurysm is a rare complication of injury to the head and neck. Most of the penetrating traumas to the carotid artery result from stabs or low-velocity missiles. Victims are usually young, otherwise, healthy men who are often under the influence of drugs or alcohol.¹ Carotid artery injuries are coincident with approximately 6% of penetrating neck injuries.² Overall, approximately 2600 aneurysms of extra cranial carotid arteries, of all types, have been reported,³ therefore, internal carotid pseudoaneurysm after a stab wound of the neck should be uncommon. We present a young victim with a stab wound to the left upper neck, followed by stroke and pseudoaneurysm of extracranial internal carotid artery.

Case Report. A 27-year-old, 183 cm, 83 kg male presented to the emergency department of Bahonar's General Hospital, Kerman, Iran with 2 cervical stab wounds, one in the midline at the thyroid cartilage level, and the other at the left angle

of the mandible, obliquely towards the carotid triangle (**Figure 1**). He was wounded 2 hours earlier. No active bleeding was present. Pulse rate was 96, and systolic blood pressure was 120 mm Hg. He was admitted for further observation and angiography. He suffered from right-side hemiparesis and aphasia 3 hours after admission, therefore, the patient was referred to the neurology department for management. He was discharged one week later and had to be managed continuously at home. Neurologic and speech deficits got better partially (approximately 70%) during the following 3 months. Left lower lip droopiness occurred, indicative of injury to the marginal mandibular branch of the facial nerve (**Figure 2**). Ipsilateral deviation of tongue was also present, indicative of hypoglossal nerve injury (**Figure 3**). Pulsatile fullness and bruit were present in the left upper neck. A CT angiography and carotid arteriography revealed a false aneurysm of the extra cranial part of the left internal carotid artery (**Figure 4**). After balanced general anesthesia and proximal and distal

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Figure 1 - Photograph of patient showing 2 stab wounds. One in the midline at the thyroid cartilage level, and other at the left angle of the mandible obliquely toward the carotid triangle.



Figure 2 - Photograph showing occurrence of left lower lip droopiness, indicative of injury to the marginal mandibular branch of the facial nerve.

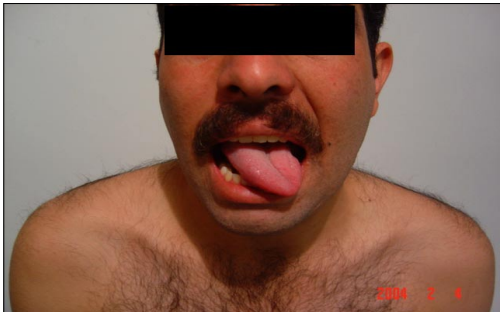


Figure 3 - Photograph showing ipsilateral deviation of tongue, indicative of hypoglossal nerve injury.



Figure 4 - Carotid arteriography revealed a false aneurysm of the extra cranial part of the left internal carotid artery.

control, the aneurysmal segment of the artery was excised and proximal and distal ends ligated. He recovered uneventfully and has remained in good condition after the operation.

Discussion. Penetrating injuries of the anterior neck that violate the platysma are considered significant because of the density of critical structures in this region.⁴ Unstable patients, or those with evidence of airway compromise, an expanding hematoma, or significant external hemorrhage should be explored promptly,⁴ and patients with altered sensoriums in whom appropriate information, examinations, and diagnostic studies are impossible should also be explored.⁴ In this case, the above criteria were not present for emergency exploration. So, the patient underwent close observation, but a stroke occurred while waiting for angiography. Patients with Monson's zone-III penetrating injuries require carotid and vertebral angiography if there is any evidence of arterial bleeding.⁵ This is important for 3 reasons: 1. exposure of the distal internal carotid and vertebral arteries is difficult; 2. the internal carotid artery may have to be ligated, a maneuver associated with a high risk of stroke; and 3. active hemorrhage from the external carotid and vertebral arteries can be controlled by selective embolization. In our case, after the patient recovered from the stroke, carotid arteriography was carried out (**Figure 4**). Doppler ultrasonography revealed intact Willis' circle and contralateral carotid and bilateral vertebral arteries. Due to an attenuated artery distal to the aneurysm, and minimal backflow, the artery was ligated.

Zhang et al,⁶ in their 17 years' experience have reported 22 patients with false aneurysm of the carotid artery secondary to blunt or penetrating trauma. Patients with pseudoaneurysm of the internal carotid artery are at a high risk of cerebral vascular accidents as well as life-threatening rupture and pressure on adjacent structures.⁷ Our patient, affected with stroke, was recovering and in order to prevent further complications, it was essential to ablate the pseudoaneurysm.^{8,9} Traditionally aneurysm resection with saphenous-vein-graft interposition is the selected management,⁶ however, carotid stenting has been carried out in recent years with great success.^{7,10-12} Because of the limitations in our institute, minimal backflow, and attenuated artery, ligation was performed.

We can draw 3 points from our case, firstly, neck injuries are important emergency problems and should be considered promptly; secondly, penetrating neck wounds should not be considered unimportant and simply sutured; and lastly, the involved artery can be ligated if necessary.

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