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Transcirculation Endovascular Trapping of a Traumatic Carotid-Jugular Fistula after Blast Injury

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Abstract

Carotid-jugular fistulas are very rare lesions. They are usually acquired secondary to penetrating neck injuries or iatrogenic after insertion of jugular central lines. These lesions might be asymptomatic or present with palpable neck mass, audible thrill, tinnitus, headaches and even cardiac failure. Their management has radically changed from open surgical repair to endovascular treatment in the recent years, mostly using intravascular stents to disconnect the arterial-venous fistula. However, if this is not feasible alternative strategies should be sought obliterate the fistula.

We present a 17 year old man that suffered a blast injury while being a bus passenger in a war conflict zone. He had multiple injuries including shrapnel wounds to the head and neck. He was airlifted in a delayed fashion to an outside hospital for further treatment. A computed tomography of the neck was ordered prior to debridement of his wounds which showed a large vascular lesion at the level of left skull base (Zone III). At arrival to our facility, the patient was complaining of severe headache and tinnitus. A cerebral angiogram was performed that showed a high flow left internal carotid to jugular vein fistula, both anterograde and retrograde, with reverse filling of the intracranial venous sinuses. There was a complete occlusion of the intracranial left carotid at the level of the skull base. Due to the anticipated difficulty to cross from the cervical to the intracranial carotid and to avoid possible embolic complications of a stent placement, trapping of the fistulous connection was carried out. For that, the internal carotid was closed with an Amplatz vascular Plug 4 and two coils (Ruby and Hydroframe) followed by a trans-circulation placement of a MVP to the left petrous carotid. His headache and tinnitus resolved after surgery and he was repatriated with no symptoms soon after the procedure.

Carotid-jugular fistulas are very rare lesions and are usually acquired secondary to penetrating neck injuries or iatrogenic post jugular central line insertion. These lesions might be asymptomatic or present with palpable neck mass, audible thrill, tinnitus, headaches and even cardiac failure. Their management has radically changed from open surgery to endovascular treatment using stents to disconnect the arterial-venous shunt (1). However, alternative strategies can be sought to obliterate the fistula if needed.

We present an early adolescent man that suffered a blast injury whilst riding a bus in a war conflict zone. He had multiple injuries including shrapnel wounds to the head and neck. A CT neck showed a large left skull base vascular lesion (Zone III). Upon transfer to our facility more than one week after the injury, patient reported severe headache and tinnitus. After consent was obtained, a cerebral angiogram was performed showing a high flow left internal carotid to jugular vein fistula, both anterograde and retrograde, with reverse filling of the intracranial venous sinuses. There was complete occlusion of the intracranial left carotid at the level of the skull base. Due to the anticipated difficulty to cross from the cervical to the intracranial carotid and to avoid possible embolic complications of a stent placement, trapping of the fistulous connection was performed. The internal carotid was closed with an Amplatzer vascular plug (Abbott, Plymouth, MN, USA) and two coils (POD coil,Penumbra, Alameda, CA. USA/ Hydrogel, Aliso Viejo, CA, USA) followed by a trans-circulation placement of a MVP (Medtronic, Minneapolis, MN, USA) in the left petrous carotid (Video 1). His headache and tinnitus resolved after surgery and he was repatriated with no symptoms two months after the procedure.

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