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Case Report

Post-Traumatic Dissection of the Right Common Carotid Artery: A Case Report

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Abstract: Arterial injuries in neck trauma often result in serious consequences that can compromise the patient's vital prognosis. Artery dissection injuries are not uncommon in traumatic events in this region. The diagnosis is based on a combination of clinical signs and confirmed by imaging. The management of neck arterial injuries is now based on algorithms based on the patient's clinical presentation at admission. We report the case of a patient who suffered a penetrating neck injury and whose imaging confirmed a dissection of the common carotid artery with occlusion of the internal carotid artery and for whom surgery was indicated based on clinical and radiologic findings.

Keywords: Cervical trauma, carotid dissection, diagnosis, management, prognosis.

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INTRODUCTION

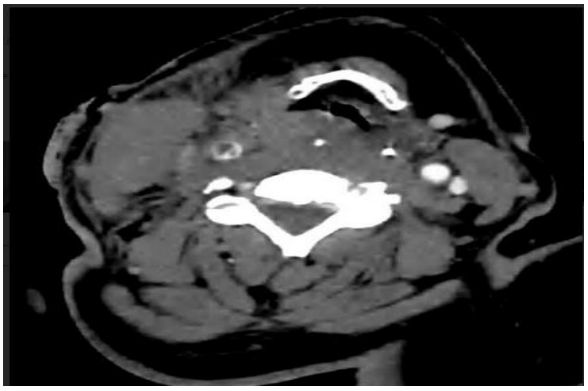
Trauma to neck vessels is rare but can be serious due to the consequences it has on the vascular territories and often puts the victim's vital prognosis at risk. We report the case of a post-traumatic dissection of the common carotid artery in a young patient who was the victim of a cervical trauma caused by a sharp weapon. The aim of this work is to describe the injury mechanism, clinical and radiological diagnosis, management approach, and clinical outcome.

OBSERVATION

A 50-year-old diabetic patient was referred from a regional center to the vascular surgery department of CHU Hassan II de Fès within 3 hours. Upon admission, the patient presented with dyspnea, dysarthria, a point-like wound in the right cervico-lateral region, no external bleeding, the presence of a right latero-cervical hematoma, and left hemiplegia. The patient was stabilized and treated.

An emergency angioscan of the supra-aortic trunk was performed, revealing:

Cervical level: Presence of a right common carotid artery dissection with a floating thrombus (Fig1), causing homolateral internal carotid artery opacification deficiency (Fig 2), extending to the middle cerebral artery and the proximal A1 portion of the anterior communicating artery.



A

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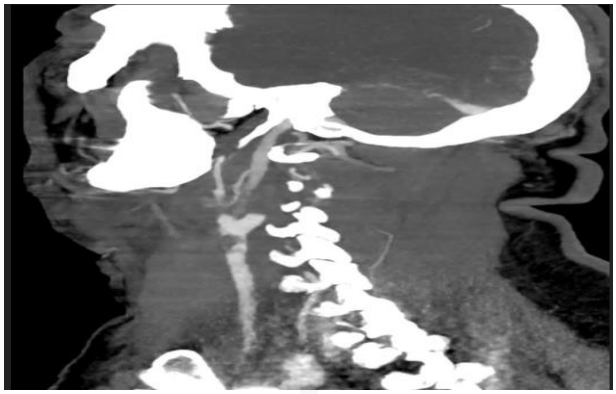

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Figure 1: Right common carotid artery dissection with a floating thrombus

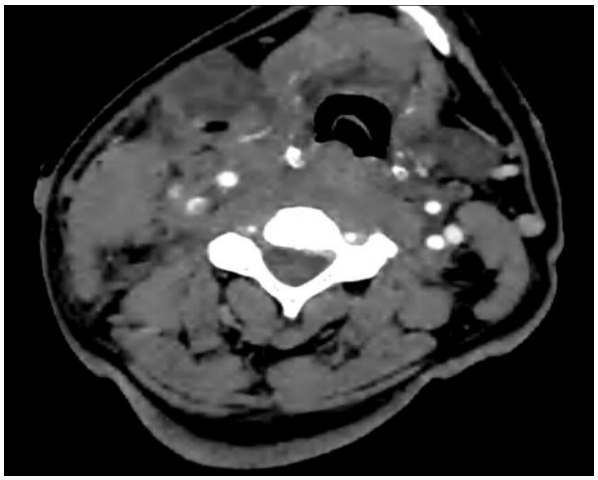

Figure 2: right internal carotid artery opacification deficiency

No contrast product extravasation at this level.

Right jugulo-carotid and retropharyngeal hematoma causing a mass effect on the tracheal region, which is displaced forward, and the oropharynx and hypopharynx, which have decreased caliber.

Brain level: Subacute ischemic appearance in the right fronto-parieto-temporal cortico-subcortical area, erasing the insular ribbon and homolateral gray nuclei, erasing the cortical sulci and causing a discrete mass effect on the homolateral VL(Fig3).

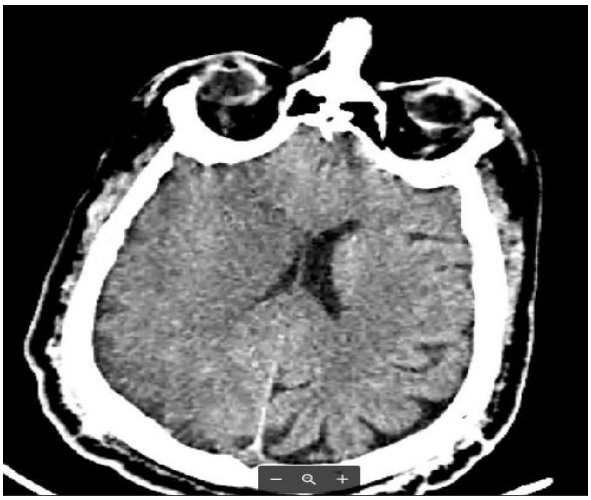

Figure 3: Subacute ischemic appearance in the right fronto-parieto-temporal cortico-subcortical area

He underwent emergency surgery for evacuation of a compressive hematoma and for hemostasis. Revascularization is not indicated. The surgical exploration revealed a transfixing point-like

lesion (outside to inside) of the common carotid artery. The breach was sutured after controlling both sides of the common carotid artery and evacuating the hematoma. There was no injury to the internal jugular vein, and no damage to other organs in the region. The patient developed anisocoria 2 hours after surgery which prompted a brain scanner (fig4) that showed an increased extent of the subacute ischemic region involving the right middle communicating artery territory, responsible for a subfalcine herniation. The patient was kept in the ICU and was intubated and ventilated. The patient died in the fourth hour after surgery and in the tenth hour after the trauma.

Figure 4: Extent of the subacute ischemic region involving the right middle communicating artery territory, responsible for a subfalcine herniation.

DISCUSSION

Injuries to the common carotid artery and other neck vessels are extremely serious. In the case of penetrating neck injuries, the majority are secondary to assaults or suicide attempts. Knife wounds are often underestimated in terms of depth, while firearm injuries depend on the caliber and kinetic energy of the projectile [1].

Carotid artery injuries occur in approximately 3-11% of cases of penetrating neck injury [2, 3]. The most commonly affected anatomical segments are the common carotid and internal carotid arteries [4].

Traumatic cervical artery injuries are classified as follows [5]:
Grade 1: Vessel irregularity, dissection with stenosis < 25% of the lumen
Grade 2: Intraluminal thrombus, dissection, or intramural hematoma > 25%
Grade 3: Pseudoaneurysm
Grade 4: Complete vessel occlusion
Grade 5: Vessel transection or contrast product extravasation.

The occurrence of a dissection-type injury in cervical vascular traumatic injury is not uncommon.

The hypothesis of a post-traumatic dissection must be considered in all victims of cervical trauma presenting with headaches, a Claude Bernard Horner syndrome, hemiparesis or hemiplegia on the contralateral side associated or not with a hematoma or pulsatile hemorrhage (open trauma). The definitive diagnosis of carotid dissection is established by imaging. Numerous studies have shown the excellent sensitivity and specificity of angio-CT scan for the diagnosis of vascular injuries in this context of cervical trauma [6-8]. The modern approach for stable patients with penetrating neck vessel trauma now relies on angio-CT scan [9, 10].

It is the most readily available and performed exam in the context of urgent cervical trauma. It takes precedence over echo-Doppler, transcranial Doppler or angio-MRI in the diagnosis of symptomatic post-traumatic dissection. In case of dissection at the arterial wall, the false lumen can lead to stenosis, occlusion or pseudoaneurysm [11]. This triggers the activation of the coagulation cascade, leading to thrombus formation and can cause cortical or subcortical infarcts usually of embolic origin [12]. An altered neurological state on admission is a marker of poor prognosis. Poor prognostic neurological criteria in penetrating carotid trauma [13]: Time window > 6 hours, coma, hemiplegia, risk of cerebral reperfusion edema, high risk of hemorrhagic transformation.

The management of carotid artery injuries has evolved over the years (4), several algorithms have been proposed based on the patient's clinical presentation for conventional surgical treatment or endovascular treatment. For isolated carotid dissection cases, antiplatelet or anticoagulant treatment remains

important. Their use in certain types of patients with associated injuries is debated.

The patient in question is a grade 2 penetrating neck trauma case, who presents with poor prognostic signs upon admission, and whose angioscanner diagnosis was post-traumatic dissection with intramural thrombus causing embolization of the internal carotid artery. The patient's clinical condition at admission prompted an indication for hematoma evacuation without revascularization. The patient died within 4 hours of the procedure due to cerebral edema, as noted on the postoperative brain scan.

CONCLUSION

Penetrating neck traumas can result in carotid artery dissection, which can cause severe neurological damage, impacting the patient's functional and vital prognosis, regardless of the quality of care.

Conflict of Interests: The authors do not declare any conflict of interests.

Contribution of the Authors:

All the authors contributed to this article, they approved the final version of this manuscript.

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