



Case Report

Radiographically occult perforation and dissection of the common carotid artery following stab injury to the neck

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ARTICLE INFO

Article history:

Accepted 21 May 2017

Available online 25 May 2017

Keywords:

Penetrating neck injury
Carotid artery perforation
Carotid artery dissection
CT angiography

ABSTRACT

In recent years, many diagnostic algorithms have been devised to reduce the rate of negative explorations associated with indiscriminate surgical management of penetrating neck injuries. In hemodynamically stable patients, the need for surgical intervention is usually determined by integrating both clinical signs and radiological findings; if such investigations remain unremarkable, recommended treatment consists in close observation and sequential physical examinations. We report on a 29-year-old male who was admitted to a Swiss tertiary care hospital after sustaining a penetrating injury to his left neck following a knife attack. Disregarding a pre-hospital account of hemorrhage from the wound and slight dysphagia, no manifest symptoms or signs of internal organ damage were present on primary survey. Moreover, there was no evidence of vascular or aerodigestive tract injury on initial CT angiography. We nonetheless proceeded with immediate surgical exploration, exposing a significant perforation of the left common carotid artery with concomitant dissection of the said vessel. Surgical repair was successfully performed and the patient suffered no long-term sequelae. We thus recommend that a high level of suspicion be upheld in both asymptomatic and oligosymptomatic patients with PNI and that clinical practitioners remain cautious in the face of deceptively reassuring radiologic findings.

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Background

The management of penetrating neck injuries (PNI), e.g. traumatic lesions violating the platysma, has long been a matter of discussion among emergency clinicians, with the most avid debate pertaining to the category of stable and oligosymptomatic patients [1]. Aside from injuries to the aerodigestive tract, PNI frequently involve damage to vascular structures such as the carotid arteries [2]. Aiming to provide improved criteria correlating with injury severity and to reduce the rate of unwarranted surgical explorations, recent studies have advocated a so-called “no-zone” approach to PNI; instead of basing decisions primarily on the location of the external injury (as in a “zone-based approach”), this strategy involves a stepwise diagnostic work-up dependent on patient symptoms, physical findings and adjunct studies [3,4]. CT angiography has been shown to constitute a valuable and readily available tool to guide decision-making in cases where a lack of “hard” symptoms obviates immediate surgical exploration

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[5,6]. Despite such advances in diagnostic acuity, one may still encounter cases such as the following where the entirety of clinical and radiological evidence remains inconsistent, prompting a course of action off the customary track.

Case report

We report on a 29-year-old male who suffered a knife stab injury to the left side of his neck following a scuffle with an unknown assailant. While the patient himself supposedly remained oblivious to his injury due to alcohol intoxication, bystanders reportedly observed some bleeding from the wound, which they proceeded to dress with a compression bandage. Upon arrival of paramedical support, the patient was found alert and hemodynamically stable. Beneath the dressing, a wound measuring around 10 mm in diameter was noted at the left superior carotid triangle (Fig. 1). Aside from superficial lacerations on the left hand and the chest, no further traumatic lesions were found. A cervical collar was applied to hold a soft compression bandage in place and the patient was taken to the resuscitation room of a tertiary care hospital. Upon arrival, he complained of slight dysphagia but was otherwise asymptomatic with a GCS of 15, a systolic blood pressure of 140 mm Hg, a heart rate of 90 bpm and a blood oxygen saturation of 99%. Initial hemoglobin levels were at 15.9 g/dL. The patient declared to be otherwise healthy. Except for the aforementioned lesions, physical examination was unremarkable; in particular, there was no active bleeding from the cervical wound, no visible hematoma and no evidence of any neurological or peripheral vascular deficit. A CT trauma scan including a cranio-cervical CT angiography study was performed, revealing circumscribed subcutaneous emphysema in the left neck without evidence of vascular, pharyngo-esophageal or laryngo-tracheal involvement (Fig. 2). Despite these findings, prophylactic antibiotic treatment was started and the patient was taken to the OR for exploration of the cervical wound under general anesthesia. Shortly after superficial dissection, we encountered substantial arterial bleeding which was traced back to an injury of the left common carotid artery close to its bifurcation; circumferential preparation of the said vessel using a “no-touch” technique exposed a perforation of both the lateral and medial arterial wall; moreover, an endoluminal dissection membrane was identified at the site of the lateral perforation (Fig. 3). Therapeutic anticoagulation was initiated intraoperatively (5000 units of heparin bolus dose) and continued henceforth (20,000 units of heparin per 24 h). The adventitial and medial layers of the aforesaid perforations were successively closed using a running 6/0 polypropylene suture and covered with gelatin-resorcinol formaldehyde-glutaraldehyde glue and absorbable gentamicin sponges. Regular flow within the common carotid artery and its branches was confirmed intraoperatively using Doppler sonography. Also the postoperative CT angiogram was free of pathological findings of the cervical arteries. The patient was subsequently transferred to the intensive care unit, showing no signs of neurological impairment after extubation. He was discharged home five days after admission following an uneventful postoperative recovery. It was recommended that therapeutic anticoagulation be continued with rivaroxaban for a total of 12 months. The patient was seen again six weeks postoperatively following a planned outpatient MR angiogram of the neck. He was free of complaints and back at work; MR imaging did not reveal any pathologic finding (Fig. 4).

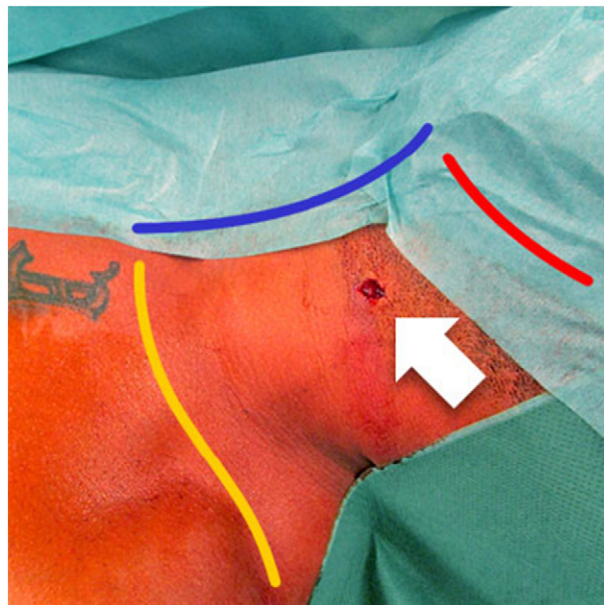


Fig. 1. External wound located at the left superior carotid triangle (red line: left lower mandibular border; blue line: anterior cervical midline; yellow line: left clavicle).

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