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Case report - Thoracic non-oncologic

Spontaneous rupture of the inferior thyroid artery resulting in mediastinal hematoma

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Abstract

In obstructive urinary tract disorders, the Valsalva maneuver can be performed in order to ease micturition. Among other things, the maneuver leads to complex vascular reactions and increases the systemic blood pressure. These vascular changes pose a serious stressor to the vessel wall and ruptures of small arteries have been anecdotically described in literature. Herein, we present a case of a patient referred to a thoracic surgeon with a huge mediastinal hematoma. Diagnostic work-up revealed a spontaneous rupture of the left inferior thyroid artery due to repetitive Valsalva maneuver.

Keywords: Mediastinum; Rupture; Vascular tone and reactivity; Valsalva maneuver

1. Introduction

Mediastinal hemorrhage mainly originates from traumatic injuries of big thoracic vessels. Injuries of smaller vessels, e.g. of the inferior thyroid artery, are seldom but can lead to life-threatening complications making a surgical intervention necessary [1].

Hematomas originating from the inferior thyroid artery are in most cases associated with insertion of a jugular venous catheter. The only case in literature describing a spontaneous rupture of this vessel has been described by Bageacu et al. [2].

The Valsalva maneuver is performed by forcibly exhaling against a closed airway. It is reflexively used to normalize middle ear pressures when ambient conditions change (e.g. diving or aviation). Furthermore, it ameliorates defecation and micturition in constipation and obstructive urinary tract disorders by increasing the intra-abdominal pressure.

We present the case of a patient with a spontaneously ruptured inferior thyroid artery after performing repetitive Valsalva maneuver.

2. Case report

A 70-year-old male was admitted to hospital with newly developed, severe dyspnea, dysphagia and hoarseness. The patient had gone through a cerebral infarction five years previously, and had suffered from a mild hypertension but was otherwise healthy and in good clinical condition. He received acetylsalicylic acid and ACE inhibitors as regular medication. Anamnesis revealed that five days before he had attended his general practitioner due to severe dysuria. An urinary tract infection was diagnosed and a treatment with antibiotics was started. However, the symptoms did not ameliorate and finally the patient could only urinate in drops with great effort. Four days later, when the patient was trying to urinate he suddenly felt a pain in his throat and developed difficulties in swallowing.

An emergency computed tomography (CT) was performed revealing a huge hematoma filling up the whole retropharyngeal space extending to the aortic arch (Fig. 1a). Arterial pressure was 167/83 mmHg and hemoglobin was 11.2 mg/dl at the time of admission. A subsequently conducted angio-CT showed a leakage of contrast agent from the left inferior thyroid artery (Fig. 1b). Since the patient's vital parameters were stable and symptoms did not deteriorate a cessation of the bleeding was assumed due to self-tamponade. Therefore, an angiography with interventional embolization of the bleeding vessel was abandoned and a wait-and-see strategy was chosen. The patient was catheterized, put on strict bed rest and was closely monitored. Fortunately, dyspnea and dysphagia ameliorated within the following days.

A subsequently performed urological evaluation revealed a severe prostatic hyperplasia as the cause of the patient's acute urinary retention. Transurethral resection of the prostate was performed and the patient was discharged in good clinical condition thereafter. A control CT performed three weeks later showed a near-complete remission of the mediastinal hematoma with a residuum of a maximum diameter of 3 cm (Fig. 1c).

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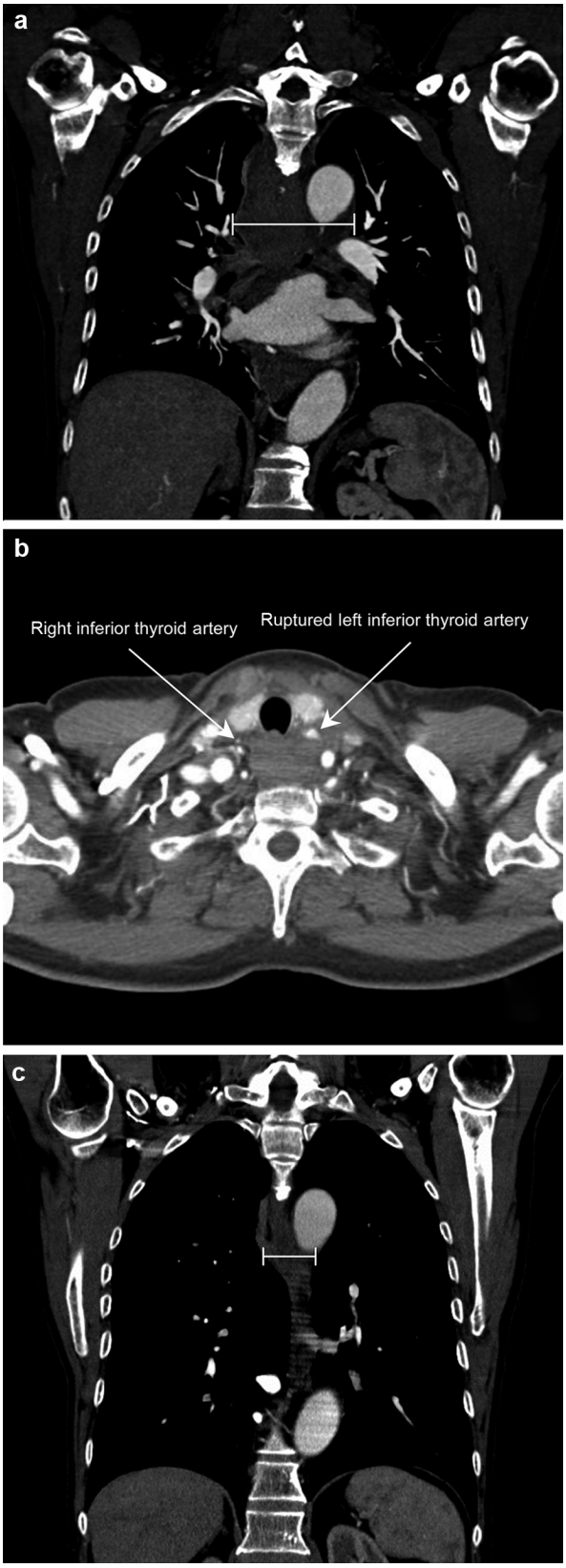

Fig. 1. CT images of the mediastinal hematoma. Initially, a huge mediastinal hemorrhage filling up the whole retropharyngeal and retroesophageal space with a maximum diameter of 8.3 cm (a). The left inferior thyroid artery was identified as the originating structure (b). A control CT performed three weeks later showed a mainly resorbed hematoma with a remaining maximum diameter of 3 cm (c).

3. Discussion

The case we present here, describes an infrequent referral to the thoracic surgeon: a spontaneously developed mediastinal hematoma. Large mediastinal hematomas are predominantly associated with traumatic aortic disruption and usually require immediate surgical intervention. Mediastinal hematomas not associated with great vessel injuries are seldom. Nevertheless, they can also cause rapid deterioration and death [1], mainly due to their expansive nature leading to compression of the heart (extrapericardial tamponade) and life-threatening interference with ventilation.

Valsalva maneuver is performed by forcible exhalation against the closed glottis leading to increased intra-thoracic and intra-abdominal pressures. This maneuver is reflexively used to ease micturition in obstructive disorders. However, complex respiratory and vascular reactions are incited resulting in an increased blood pressure. Systemic pressures up to 345/245 mmHg have been described during Valsalva-assisted weight lifting. This indicates the enormous stress the maneuver poses on small artery vessel walls [3]. Ruptures of small vessels due to a repetitive Valsalva maneuver have been anecdotically described in the literature with a susceptibility to cerebral vessels [4, 5].

To the best of our knowledge no former report exists describing a spontaneous rupture of the inferior thyroid artery after an extensive Valsalva maneuver. A massive hematoma developed in our patient spreading to the whole retropharyngeal and retroesophageal space.

When mediastinal hematoma is suspected, diagnostic imaging should be performed immediately in order to enable a fast decision. Based on the patient's condition and the diagnostic findings three therapeutical options should be weighed: (1) Operative intervention and draining of a mediastinal hematoma should only be considered if severe cardio-respiratory problems occur due to the increased intra-thoracic pressure. (2) Angiography and embolization are minimally-invasive interventions and should always be considered when the bleeding persists. (3) If the patient is stable a wait-and-see strategy is the best option. Although in our patient a huge hematoma developed, finally, no intervention was necessary, since he was in a stable condition and the symptoms ameliorated.

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