

Idiopathic common carotid artery laceration with no history of trauma

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Abstract

An adult male with no history of trauma visited an emergency outpatient clinic for idiopathic progressive cervical swelling. We report a case in which, from the results of contrast enhanced computed tomography examinations, the neck was urgently opened and the carotid artery was reconstructed to save his life.

Idiopathic common carotid artery laceration with no history of trauma;A case report

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Background

In the emergency room, patients are often forced to respond rapidly to treatment and do not follow the usual treatment processes. Therefore, patients are treated based on findings obtained within a short period. Herein, we report a case wherein a rapid neck incision and exploration was lifesaving.

Case presentation

A 52-year-old man with a history of hypertension and smoking (32 pack-years) presented to our emergency department with a complaint of sudden neck pain and swelling that had been evolving for approximately 3 h before consultation, without any apparent trigger. He had no history of neck surgery, puncture, trauma, or irradiation.

His body temperature, blood pressure, heart rate, and SpO₂ were 36.2°C, 177/111 mmHg, 75 beats/min, and 99%, respectively. Physical examination revealed a swelling on the left side of the neck with no warmth or trauma scars. Palpation revealed a gradually widening left cervical tightness.

Laryngoscopy revealed a slowly progressive laryngeal edema with no obvious mass or bleeding. Contrast-enhanced computed tomography (CT) showed a widespread low-absorption area without contrast effect or ring enhancement in the left cervical region; no abscess or active bleed was observed.

Neck ultrasonography showed uniform hypoechoic areas with absence of blood flow around the cervical vessels and thyroid gland; moreover, there were no findings suggesting bleeding from the main cervical artery.

Magnetic resonance imaging was not performed due to the emergency. Although the various examinations did not establish the source of bleeding, we considered that the swelling was a cervical hematoma inducing gradual supraglottic stenosis. However, no extravasation was observed in both arterial and venous phases during contrast-enhanced CT [1].

Tumor was also considered as a differential diagnosis, although it was unlikely because of the rapid progression of symptoms over a few hours. In addition, the patient had no history of trauma or irradiation; thus, we suspected a disruption of a peripheral branch of the cervical artery or bleeding from the parathyroid gland, which has been reported in numerous cases [2-4].

Therefore, we performed a trial cervical opening and tracheotomy under general anesthesia to identify the bleeding source on the left side of the neck and secure the airway. A skin incision was made over the sternocleidomastoid muscle to easily reach the hematoma cavity (Figure 1).

The hematoma was removed while checking the main arteriovenous system to avoid intraoperative damage to the system. When most of the hematoma was removed, a large amount of blood suddenly gushed out from an unidentified source; the blood even reached the surgeon's face, who was in an upright standing position. We did not suspect a bleeding source other than the common carotid artery. The left common carotid artery was examined, and a blunt laceration of approximately 3 mm length was found on the medial side of the main trunk, leading to the diagnosis of idiopathic common carotid artery laceration. There was no damage to the outer wall of the common carotid artery or any other structure around the sternocleidomastoid muscle; hence, we maintained the diagnosis of idiopathic carotid artery laceration.

A vascular tape [5] was used to apply cephalic and caudal manual compression to the common carotid arteries to temporarily block blood flow; after blood flow interruption, a blunt injury of approximately 3 mm was observed on the medial side of the carotid artery (Figure 2).

A long interruption time of blood flow poses a risk of cerebral infarction and hypoxic encephalopathy [6, 7]; hence, we initiated immediate common carotid artery reconstruction in the short-axis direction (using 8-0 absorbable suture) under microscopic guidance, while adequately monitoring oxygen saturation and blood flow interruption time. The area surrounding the laceration was covered with Surgicel cotton (Figure 3A, B). The total blood flow interruption time was 31 min. Finally, tracheotomy was performed to complete the surgery. The total blood loss was 537 mL, and postoperative hemoglobin levels remained stable; therefore, blood transfusion was not performed. The postoperative course was favorable, and the patient was weaned off the ventilator on postoperative day (POD) 1. There were no cerebral or neurological complications, and the rehabilitation course was favorable. The tracheal foramen was closed on POD 15, and the patient was discharged on POD 18. The patient provided informed consent, and the study design was approved by the appropriate ethics review board.

Discussion and Conclusions

Carotid artery injury is known as carotid blowout syndrome (CBS); to date, no case of idiopathic CBS has been reported. Moreover, CBS results from blood vessel wall necrosis due to surgical resection or radiation therapy for head and neck cancer. Other causes include blunt trauma or medically-induced injury during surgery. Hence, some types of trauma trigger CBS.

CBS is an infrequent, but rapidly fatal condition if diagnosed late. The present case does not fit the above-mentioned causes because the patient only had a history of hypertension and smoking.

The preliminary CT scan did not clearly show extravasation, probably because the wound was compressed by the large hematoma. We considered angiography, including a Matas test [8, 9]; nevertheless, because our facility was a general city hospital, it was difficult to perform an endovascular treatment in the head and neck region [10]. In addition, the airway emergency made it difficult to transfer the patient to a facility where the procedure could be performed; therefore, we prioritized swelling exploration through an external incision.

After a retrospective review of the contrast-enhanced CT images, a small extravasation that appeared to be a hemorrhage point was observed in one CT image slice, although it was not initially highlighted. Postoperative three-dimensional images also revealed that the same site was the source of the idiopathic hemorrhage (Figure 4A, B).

A careful analysis of the CT images could have led to a preoperative detection of extravasation. Nonetheless, we did not consider the diagnosis of common carotid artery disruption; hence, we did not make a good judgment.

Small lacerations can be sutured intraoperatively, whereas large lacerations require reconstruction by grafting the external jugular vein patch or its vein wall [11], which necessitates prior imaging information.

In conclusion, this case demonstrates that if a neck hematoma is suspected on imaging in a young patient with no history of head and neck cancer surgery, radiotherapy, or trauma, it is necessary to consider bleeding from the main trunk of the carotid artery and establish an effective system for surgery.

List of abbreviations

CT: computed tomography; CBS: carotid blowout syndrome; POD: postoperative day

Declarations

Ethics approval and consent to participate: The study design was approved by the appropriate ethics review board and the patient provided informed consent.

Consent for publication

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Competing interests: The authors declare that they have no competing interests.

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