Recurrent syncope caused by compression of internal carotid artery by an anomalous hyoid bone

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Summary
In rare cases a syncope can be caused by compression or irritation of the carotid artery and the carotid sinus due to congenital anatomical anomalies of cervical structures like the hyoid bone. We present the case of a 36 year old man with recurrent syncope when turning his head. Clinical investigations revealed a hyoid bone anomaly with elongated lesser cornua, especially on the right symptomatic side. Surgical resection of the right lesser cornu led to complete resolution of symptoms over a two year follow-up. Syncope especially in younger subjects may be caused by congenital anomalies of the musculoskeletal system in the cervical region and should be considered in the differential diagnosis of syncope, transient cerebral ischemia and stroke.

Key words: Hyoid syndrome, carotid sinus compression, positional syncope, carotid anomaly, carotid entrapment

Introduction
Episodes of syncope or near syncope induced by head rotation can be related to compression of extracranial arteries within the neck. Often, in such cases compression of vertebral arteries resulting in cerebrovascular insufficiency is diagnosed [2, 12, 16, 18, 19]. The Eagle syndrome represents another clinical entity where the carotid artery is compressed by an elongated styloid process causing episodes of transient cerebral ischemia and stroke [6, 8]. Hyoid bone anomalies also may cause compression of the carotid artery leading to transient cerebral ischemia [11], however some authors hypothesize that internal carotid artery compression by hyoid horn may lead to atherosclerotic carotid stenosis [1]. Hyoid bone is located in front of cervical spine and is an attachment locus for neck, tongue and throat muscles. Hyoid bone is horseshoe shaped and consists of the body and greater and lesser cornua (horns). The greater horns are turned backwards whilst the lesser horns are turned upwards and towards the back. Anatomical defects of the hyoid bone structure are very rare. Transient cerebral ischemia caused by compression of carotid artery due to anatomical deformation of hyoid bone is an extremely rare pathology [5, 9, 17]. Episodes of syncope described in patients with Eagle’s syndrome might result from irritation/compression of carotid sinus, however compression of the internal carotid artery and hemispheric ischemia cannot be excluded.

Case report
We present the case of 36 year old man who suffered from recurrent syncope or near-syncope episodes often preceded by visual symptoms (impaired vision or brief loss of vision in the right eye) while turning his head to the left with immediate remission of symptoms with his head returned to the neutral position. CT scans and CTA scans of the neck revealed an anatomical anomaly of the hyoid bone with elongated lesser cornu of the hyoid bone (Figure 1). The elongation of the right lesser horn /lesser cornu/ was very close to the right internal carotid artery (Figure 2). Interestingly the hyoid bone anomaly was accompanied by elongated right styloid process suggesting shortening of stylohyoid ligament and muscle. The duplex-doppler examination revealed critical stenosis or even complete closure of the internal carotid artery with head rotation to the right. At the same time no significant bradycardia was noticed. Excessive elongation of one of the horns can lead to the compression of the internal carotid artery. In our case elongated right lesser cornu was accompanied by an elongated right styloid process and compression of the internal carotid artery might have

Zusammenfassung
Rezidivierende Synkopen als Folge von Kompression der Arteria carotis interna durch ein anomales Zungenbein
resulted from the elongated lesser cornu itself or from the stylohyoid ligament. Because of recurrent symptoms surgical treatment was considered to be indicated. After completing necessary examinations the patient was operated under general anesthesia. He underwent resection of the elongated smaller horn on the symptomatic side using a lateral transcutaneous approach (Figure 3). There were no surgical complications and the resection of the elongated smaller horn completely released the internal carotid artery. Surgery lead to definitive cure of the patient. During two year follow up no recurrent symptoms were observed.

Discussion

Our case report points out that in the differential diagnosis of syncope unusual cases of carotid artery compression/irritation, especially in younger subjects, should be considered. Carotid compression may lead to transient ischemic attacks with brief loss of vision and stroke. A syncope may also occur as the result of hemispheric ischemia [3, 6]. Compression of carotid sinus by rotation of the head may induce a vasodepressor reflex and syncope; however in our case it is unlikely, because the carotid sinus was located proximally to the elongated lesser cornu and could not be directly compressed during head rotation. Also, we did not observe bradycardia at the time of syncope in our patient. Differential diagnosis should include fibromuscular dysplasia, inflammatory vascular disease (e.g. Takayasu’s arteritis), cervical arterial dissection and congenital anatomical anomalies of the vascular, skeletal and muscular systems in the cervical region [4, 6, 7, 11, 13, 14, 16, 18].
It should be stressed that long-lasting and recurring compression of the internal carotid artery can lead to chronic injury of the arterial wall with wall fibrosis, intimal plaque development and carotid artery aneurysm, leading to cerebral ischemic stroke [1, 5, 9, 11, 17]. Rare anomalies of hyoid bone and their impact on the carotid artery as well as on the symptoms of brain ischemia are difficult to diagnose and require considerable experience in the field of vascular diagnosis [5, 9, 17]. Dual imaging ultrasound scans allow to visualize compression of carotid artery when turning head and neck (functional tests). However, it requires a great deal of experience from the examiner [10]. Computed tomographic arteriography (CTA) is considered an excellent diagnostic option. Classic angiography with intra-arterial application of contrast agent and application of functional tests remains the diagnostic gold standard which can confirm the diagnosis of anomalies of carotid arteries including compression syndromes. [15, 19].

Conflicts of interest

There are no conflicts of interest existing.

References

Case report


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