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Internal carotid artery anomaly in oropharynx as a rare cause of sore throat

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ABSTRACT

Background: Anomaly of internal carotid artery (ICA) is a very rare variation. In almost all the cases, the anomaly was on the right side. This right-sided predominance may be attributed to anatomical influences and factors affecting blood pressure.

Case report: A 67-years-old man presented to ear, nose and throat (ENT) outpatient clinic in Al Wakra Hospital complain of sore throat, there was associated medical co-morbidities (diabetic, hypertensive, hyperlipidemia and coronary artery diseases). ENT examination showed a pulsating, bulging mass on the right posterolateral oropharyngeal wall with normal mucosal covering. CT scan with contrast showed aberrant course of the right ICA which is coursing medially in prevertebral space and right posterolateral hypopharyngeal wall over a length of approximately 1.7 cm, making an acute U-turn before resuming the normal course and its distal aspects, only a thin layer of mucosa noted over the aberrant course of ICA.

Conclusion: Anomaly of ICA must be kept in mind in the evaluation of patients with sore throat associated with oropharyngeal mass especially in old-aged patients with atherosclerotic diseases.

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KEYWORDS

Tortuous; internal carotid artery anomaly; sore throat; oropharynx

Introduction



An anomaly of the internal carotid artery (ICA) is a very rare variation. Normally, the ICA develops from the third aortic arch and the dorsal aorta further up. In fetal life and in infants, the tortuosity of carotid arteries is common. With the descent of heart and elongation of the neck, the arteries assume the normal position. If the embryological state persists, it leads to tortuosity or kinking of the arteries [1,2]. In almost all cases, the anomaly was on the right side. This right-sided predominance may be attributed to anatomical influences and factors affecting blood pressure. Furthermore, the typical causes of peripheral vascular disease (i.e. hypertension, hyperlipidaemia and smoking) are probably also contributory factors [3]. Vague abnormal throat sensation or sore throat which is aggravated by swallowing is the main symptom, or the patient may be presented with oropharyngeal swelling [4]. It is important for otolaryngologists to recognize this anomaly because an abnormal carotid artery is at risk for fatal hemorrhage during pharyngeal procedures, both major (e.g. oropharyngeal tumor resection) and less extensive (e.g. tonsillectomy,

adenoidectomy). This condition is often diagnosed on the basis of radiological examinations such as contrast-enhanced computed tomography (CT), magnetic resonance imaging (MRI), magnetic resonance angiography, and digital subtraction angiography [3].

The aim of our presentation is to highlight on very rare cause of sore throat in adult due to tortuous right internal carotid artery (ICA). It is important for otolaryngologists to recognize this anomaly, because fatal hemorrhage during oropharyngeal surgery, intubation includes orotracheal intubation and nasotracheal intubation and endoscopy can occur in patients with this condition during surgical procedures on the pharynx.

Case report

A 67-years-old man presented to ear, nose and throat (ENT) outpatient clinic in Al Wakra Hospital complain of sore throat for the last 2 years, there was no associated history of dysphagia or other ENT symptoms but there was associated medical co-morbidities (diabetic, hypertensive, hyperlipidemia and coronary artery diseases). ENT examination showed a pulsating, bulging

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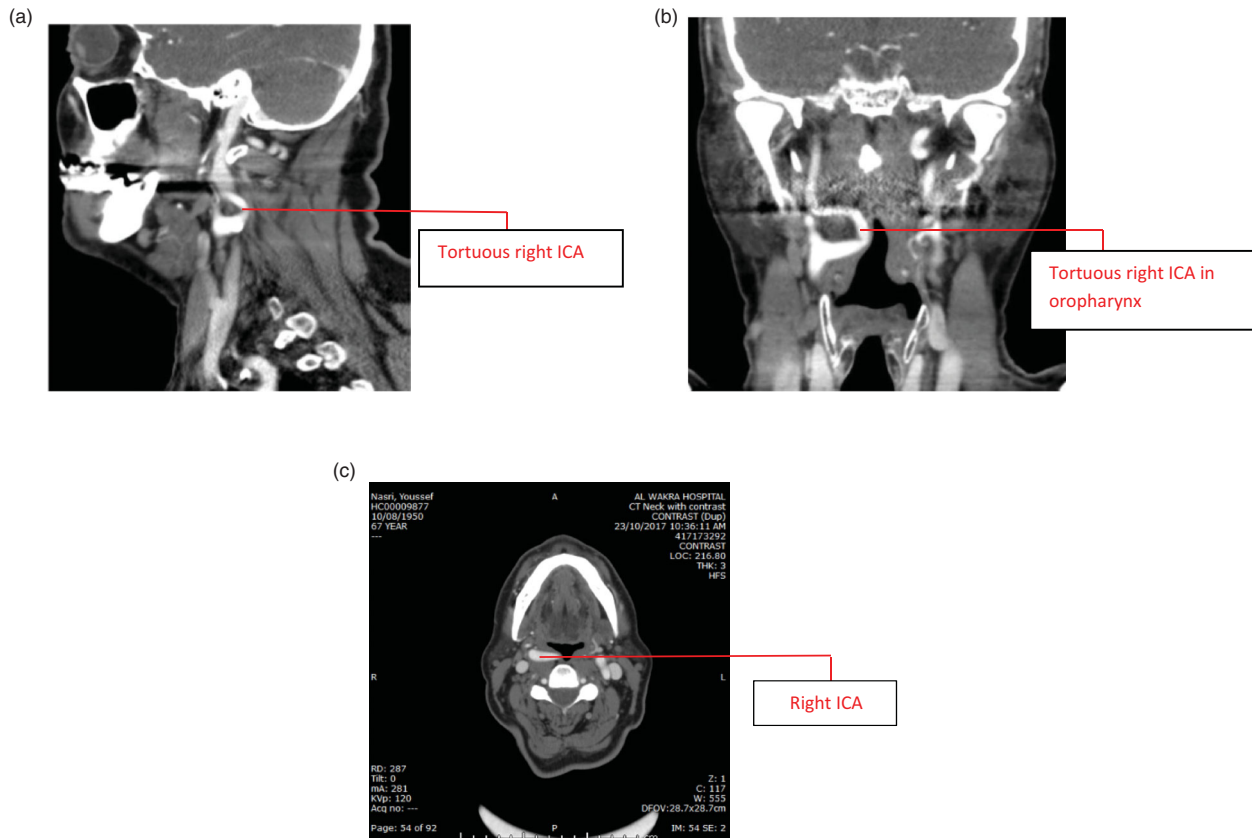


Figure 1. (a, b, c) CT scan with contrast (a) sagittal view, (b) coronal view, (c) axial view of the same patient.

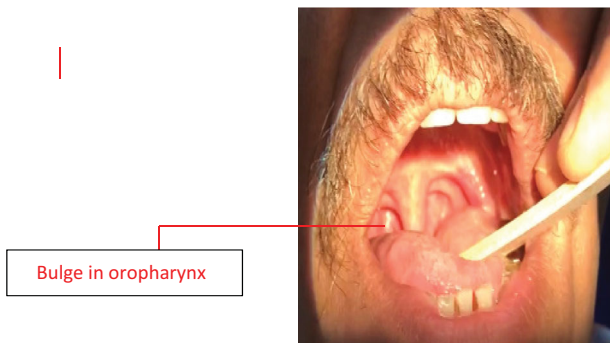


Figure 2. Clinical picture showed bulge in oropharynx of same patient.

mass on the right posterolateral oropharyngeal wall with normal mucosal covering. There were no bruits over the lateral side of the neck or neck masses. Remaining ENT and cranial nerves examination were normal.

CT scan with contrast showed the aberrant course of the right ICA which is coursing medially in prevertebral space and right posterolateral hypopharyngeal wall over a length of approximately 1.7 cm, making an acute U-turn before resuming the normal course and its distal aspects, only a thin layer of mucosa noted over the aberrant course of ICA (Figure 1).

CT scan of the neck with contrast to 67 years old patient with sore throat showed tortuous ICA. There is

an aberrant course of the right ICA seen which is coursing medially in prevertebral space and right posterolateral hypopharyngeal wall over a length of approximately 1.7 cm, making an acute U turn before resuming the normal course and its distal aspects. Only a thin layer of mucosa noted over the aberrant course of ICA and hypo-pharynx resulting in contour bulge (Figure 2).

Discussion

Anomaly of ICA in the neck is rarely observed in the outpatient clinic of otolaryngology. It is an anatomic abnormality that may cause pharyngeal symptoms, and the main causes of tortuosity are atherosclerosis, hypertension, and congenital deformities [4]. The internal carotid arteries are formed in the embryo from the remnants of the third aortic arch and dorsal aortas, by the fifth week of development. When the fetus matures and elongates, the great vessels and the heart descend in the thorax. An aberration in this process results in the redundancy of the ICA, and hence an anomaly of congenital origin [5]. In our case report, the patient carried most of the acquired predisposing factors of vascular diseases, i.e. diabetes mellitus, hypertension, hyperlipidemia and history of coronary artery

diseases, as well as aging process which decreases the arterial wall elasticity and may contribute to the development of this anomaly. The cause of this deformity is atherosclerosis as observed in our patient, and congenital deformity. ICA bulge the lateral pharyngeal wall that caused a persistent throat abnormal sensation, sore throat with or without dysphagia, globus sensation, mild chronic cough and occasional aspiration. All those symptoms due to pharyngeal bulging or even pressure effect of the ectopic position of ICA. In our patient the bulge on right side posterior pharyngeal wall was an incidental finding during our clinical examination. Several conditions can cause sore throats such as inflammations, neoplasms or anatomic abnormalities. The tortuosity of the ICA is an anatomic abnormality that may cause this symptom. Tortuous ICA bulging from the lateral pharyngeal wall causing a persistent abnormal sensation in the throat like a sore throat. We reviewed the literatures on anomaly of ICA; it appeared to almost always affect the right side due to embryological factors influences the right side during fetal development [6–8]. Hypertension and atherosclerosis induce hypertrophy of the heart, which causes the aorta to be lifted up at right angles toward the head. Because the common carotid artery is fixed around the thyroid

cartilage at the point of bifurcation, a force vector is created toward the midline. Thus, atherosclerosis of the ICA leads to the formation of global projections of the vessel into the right retropharyngeal space, which has loose soft tissues (Figure 3). This may explain the right-sided predominance of this anomaly [3] (Figure 4).

The blood vessel anomalies of the head–neck area may result in death due to massive hemorrhage during head and neck surgery. Although anomalies of ICA are observed particularly on the posterior pharyngeal wall, we may confront them in various localizations. Because

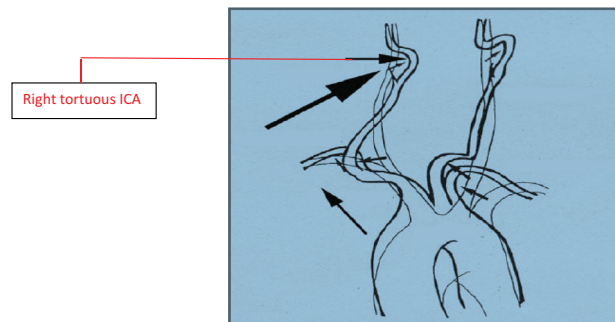


Figure 4. The right-sided predominance of tortuous ICA. Large arrow indicates a force vector created toward the midline, while a small arrow indicates force vectors at each point of the arteries.

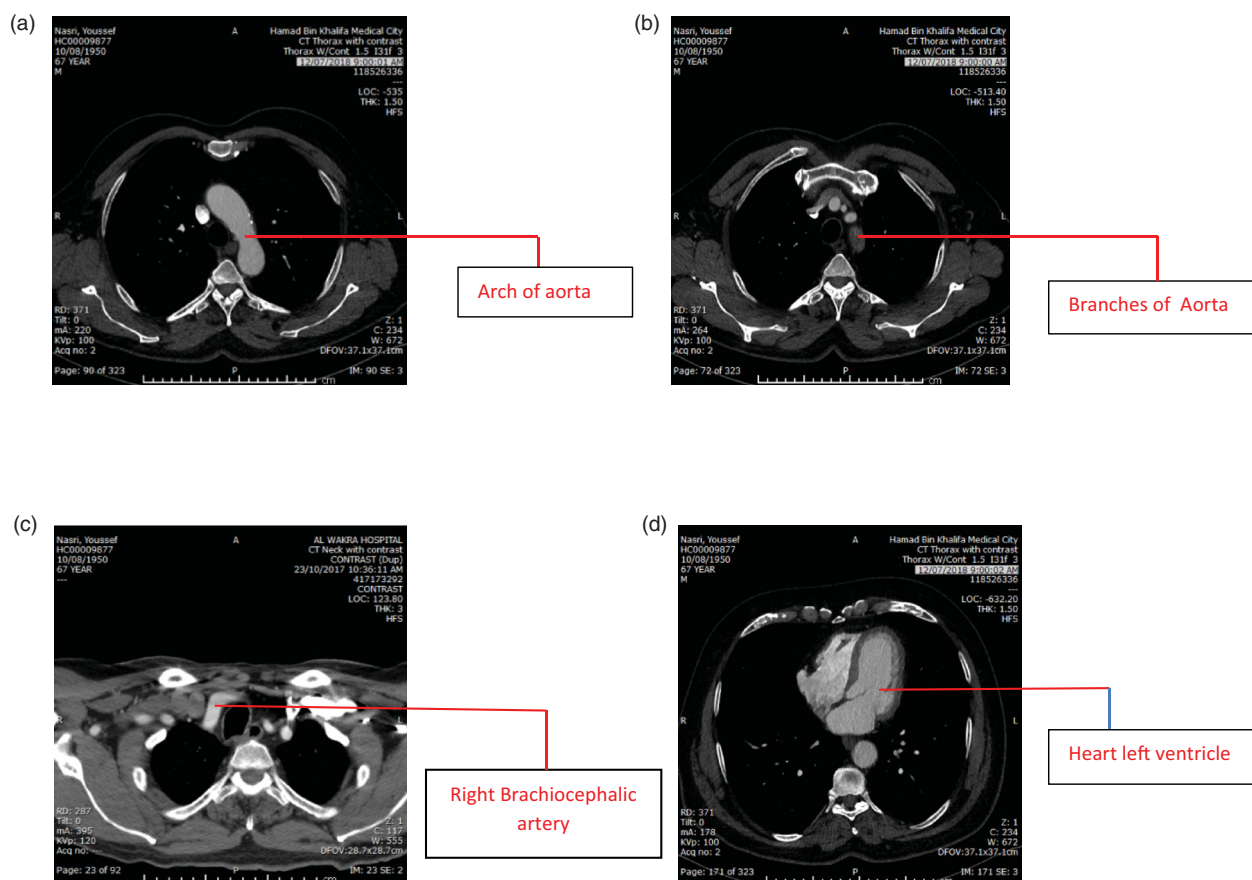


Figure 3. (a, b, c, d) CT scan chest with contrast axial view of same patient.

of these anomalies, the surgeon must always be aware of this risk during tonsillectomy, adenoidectomy, and uvulopalatopharyngoplasty operations [9,10]. In a review of the literature, four cases of injury of the ICA during adenoidectomy were reported, two with a fatal outcome. Knowledge of anomalies ICA in the head and neck region is important not only in routine oropharyngeal surgery but also in nasotracheal intubation. The nasotracheal tube can penetrate the oropharyngeal mucosa [4]. Anomaly of ICA needs no treatment as long as the patient does not have a cerebrovascular ischemic sign. Anomaly of ICA must be kept in mind in the evaluation of patients with sore throat associated with oropharyngeal mass and even in routine surgeries such as tonsillectomy and adenoidectomy. Patients should be informed of their condition, and this finding must be clearly documented in their health records for reference.

Conclusion

Anomaly of ICA must be kept in mind in the evaluation of patients with sore throat associated with oropharyngeal mass especially in old aged patients with atherosclerotic diseases.

Disclosure statement

All authors declare no financial or personal relationships with other people or organizations.

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