



## Research Article

# Aneurysm of internal carotid artery, which simulated paratonsillary abscess (clinical case)

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### ABSTRACT

The aneurysms of the internal carotid arteries (ICAs) are one of the most common diseases of vascular surgery. Besides, the inflammation of paratonsillar tissue is also one of the common problems in otorhinolaryngology. This article describes a rare case of paratonsillar abscess imitation among the patients with the aneurysm of ICA. The purpose of the study is to describe the methods of this disease diagnosing using the example of a clinical case, to give a general description of this nosology occurrence frequency, and to recommend a detailed approach to the differential diagnosis among this category of patients. The article provides guidance on the management of such patients.

**KEY WORDS:** Imitation, Internal carotid aneurysm, Paratonsillar abscess, Paratonsillitis

## INTRODUCTION

Paratonsillitis is an inflammatory process that develops in the paratonsillar space surrounding the tonsils. As a rule, peritonsillitis and peritonsillitis abscess appear among young and old people. Arterial aneurysm (AA) is a local aneurysmal expansion or the protrusion of the arterial vessel wall. AAs of internal carotid artery (ICA) extracranial area are one of the some rare carotid artery diseases. It occurs only in 1–2% of cases.<sup>[7]</sup> According to some data, the frequency of ICA aneurysm development makes from 0.4% to 1% of all AAs. Moreover, it reaches about 12% of all peripheral artery aneurysms.<sup>[18-20]</sup>

We supervised a patient with a suspected paratonsillar abscess on the left. During the visual inspection, the aneurysm of both ICAs was suspected and then verified.

The anatomical proximity of paratonsillar tissue and ICA, subjected to the pathology of the latter, can lead to an incorrect diagnosis of pharyngeal diseases.

We consider that it is appropriate to demonstrate our own clinical observation.

### Goal

The goal of this study is to describe the clinical case of a patient with ICA aneurysm, simulating the paratonsillar abscess.

### Clinical Case

The patient V., 67 years old, was delivered by an ambulance team to the emergency department of the Central Regional Hospital (CRH) in one of the districts of the Belgorod region with suspected paratonsillar abscess on the left. The patient complained of a slight throat pain, more to the left, sore throat, the feeling of a lump when swallowing, the difficulty of solid food eating, headache, and head noise. There was no trismus. The patient was treated in the CRH for 10 days with the diagnosis of left-sided paratonsillitis. She received antibacterial, anti-inflammatory therapy. During hospitalization, the patient's state of health improved slightly - the throat pains stopped. However, the feeling of a lump in the throat, the difficulty during swallowing, headache, and head noise persisted. It should be noted that, during the entire hospital stay, the body temperature remained normal. The indicators of clinical blood analysis are in the normal range.

Due to the lack of effect from the treatment and for further treatment tactics determination, the patient was transferred to the otorhinolaryngology department of the BRCH named after St. Joasaph. The body temperature at admission made 36.6°C. The

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blood test was without inflammatory changes. During the pharyngoscopy, there was the protrusion of the anterior palatine arch on the left. The tissues around the pharynx are asymmetrical and shifted to the right. The palpation of the anterior and posterior left palatine arches is painless. The mucous membrane is pink, smooth, and without reactive changes. The pulsation of the right back palatal arch attracted attention. There was no trismus. The submandibular region is painless during the palpation on both sides; the submandibular lymph nodes are not palpable. The neck shape is not changed. They performed the puncture of the left paratonsillar space, and copious amount of blood was obtained - at that the volume of lesion did not decrease. A slight bleeding stopped after the puncture.

Considering the findings, it was decided to perform a spiral computed tomography (SCT) of the head and neck with intravenous bolus contrasting the angiography of the brachiocephalic arteries (BCAs) and main arteries of the head to exclude or confirm vascular pathology. According to SCT data, partially thrombosed aneurysms of both ICAs are noted. To the right, the proximal sections of ICA are the medial direction, 40 mm from the mouth of the right ICA, and the vessel abruptly changes the movement in the opposite direction with the development of a bend. The knee is determined almost medially, adjacent to the wall of the oropharynx. After 11 mm from the knee, the thrombosed part of the aneurysm of 19 mm × 26 mm × 24 mm is determined along the upper contour of the vessel. The distal right ICA is determined by the lateral contour of the thrombosed aneurysm and then upward. To the left, after the ICA bulb, the bend is determined at the right angle with the change of the course direction medially, and a pronounced spiral course is determined 2 cm after the bend. Then, ICA is directed upward; the extravasation of a contrast agent of 18 mm × 20 mm × 35 mm is determined by its lateral contour. The dimensions along the external contour of the aneurysm (including the thrombosed portion) make 30 mm × 45 mm × 50 mm. The ICA rises upward along the internal contour of the aneurysm, and it is displaced medially.

Besides, the patient underwent a comprehensive examination: Ultrasound examination of the lower extremity arteries, transthoracic ECHO-cardioscopy, and ultrasound duplex scanning (USDS) of the abdominal aorta, iliac arteries, the arteries of the lower extremities, and BCA. The patient was consulted by the following experts: Neurologist, cardiologist, and ophthalmologist. Thus, the diagnosis was made: Aneurysmal disease, pathological hemodynamically significant tortuosity of both ICAs in combination with the aneurysmal transformation of both ICAs with stratification and the formation of a false lumen without rupture (a sacky, partially

thrombosed large symptomatic aneurysm on the left and a small asymmetric aneurysm on the right.

The patient was transferred to the vascular surgery department for further treatment. The presence of a false aneurysm with the platelet concentrates both ICAs, with the dissection on the left. To prevent an acute cerebral circulation and transient ischemic attacks, as well as the rupture of the aneurysm with the development of massive bleeding, a surgical treatment is necessary - the resection of the left carotid aneurysm on the left ICA, followed by the resection of the aneurysm on the right ICA. The patient was operated: They performed the resection of the left ICA aneurysm with the autovenous prosthesis. 9 days later, the patient was discharged from the department after the surgery in a satisfactory condition. The resection of the right ICA aneurysm was performed after 6 months. The patient was also discharged from the department in a satisfactory condition on the 10<sup>th</sup> day after surgery.

## DISCUSSION

The presented clinical case is of interest in the context of paratonsillar abscess (paratonsillitis) differential diagnosis and ICA aneurysm. Some aspects of this pathology diagnosis and treatment require a more detailed consideration. The literature describes isolated cases when there were issues in the diagnosis of the presented diseases. In one case, an 84-year-old woman was hospitalized at the otorhinolaryngology department with the suspicion of a right-sided paratonsillar abscess according to emergency indications.<sup>[5]</sup> In another case, a 28-year-old woman was taken to the otorhinolaryngological department with a right-sided paratonsillar abscess.<sup>[6]</sup> During the examination, the aneurysms of ICA were detected in both the cases.

Paratonsillitis usually develops after an acute inflammation in the tonsils, as a complication or against the background of chronic tonsillitis. Clinically, paratonsillitis manifests itself not only in an infiltrative form but edematous and abscessing form can also occur.<sup>[13]</sup> The general condition of the patient with paratonsillar abscess: The patient suffers from severe intoxication. Main complaints: The expressed unilateral pain in the throat (less often from two sides - during the bilateral process), headache, difficulty during swallowing, profuse salivation, and slurred and nasal speech. The locked jaw is a characteristic clinical sign. Pharyngoscopy is difficult because of the pronounced locked jaw. The mucous membrane of the paratonsillar space and the anterior palatine arch is hyperemic, edematous, and the palatine uvula shift is noted in the opposite direction. The tension of the mucous membrane and the fluctuation in the area of the

greatest protrusion are determined during palpation. There is the rise of body temperature up to febrile numbers. Inflammatory changes in the clinical analysis of blood: Leukocytosis with the shift of the differential blood cell count to the left, and ESR increase.<sup>[14]</sup>

Several factors can be involved in AA onset: Predisposing congenital factors, hypertension, atherosclerotic disease with the degenerative lesion of the arterial vascular wall, individual features of the vascular bed hemodynamics. Aneurysms differ from each other by shape, size, and the carrying vessel location. A blood clot may be located in AA cavity. Krylov<sup>[10]</sup> distinguished saccular, fusiform (spindle-shaped), and bubble AA.<sup>[11]</sup>

Anatomically, the ICA is located in the posterior part of the parapharyngeal space, moving away from the bifurcation of the common carotid artery at the level of the thyroid cartilage edge, and reaches the external opening of the skull base carotid canal. There are also glossopharyngeal, accessory, wandering, hypoglossal, and sympathetic nerves in the posterior part of the parapharyngeal space. The palatine tonsil is adjacent to the anterior part of the parapharyngeal space.<sup>[12]</sup> Besides, some authors Bouthillier *et al.*, Gibo *et al.*<sup>[4,8]</sup> divide the ICA into segments: C1 - cervical, C2 - stony, C3 - cavernous, C4 - clinoid, and C5 - supraclinoid [Figure 1].

The deposition of atherosclerotic plaques occurs most often at the site of the common carotid artery bifurcation and the cervical region of the ICA. Furthermore, the deposition of plaques can occur in the place of artery pathological tortuosity.<sup>[3,15]</sup> Pathological tortuosity can be explained by hereditary predisposition, the violations of embryogenesis.<sup>[1,2]</sup> Pathological tortuosity conditioned by hereditary predisposition will manifest itself from an early age and will be accompanied by other developmental anomalies.<sup>[12]</sup>

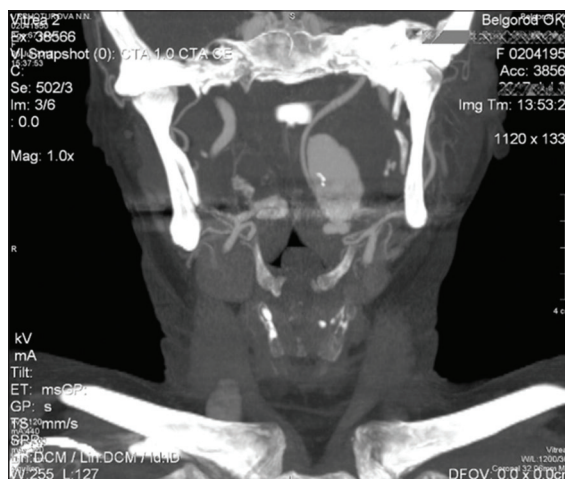
The presence of ICA aneurysms can lead to impaired cerebral circulation. Pokrovsky *et al.* identified 4 degrees of cerebral circulation disorders: (1) Asymptomatic group, (2) transient disorder, (3) chronic vascular insufficiency, and (4) a stroke or its consequences.<sup>[15]</sup>

The patients with the transient disorders of cerebral circulation have the following complaints: Dizziness, tinnitus, headache, double vision, short-term loss of consciousness, and staggering during walking. All these complaints are not constantly present, occur periodically, and last from several seconds to several hours.<sup>[15]</sup> Chronic vascular insufficiency of the brain is characterized by the deterioration of memory, headaches, decreased performance, and intelligence. However, ischemic strokes are not the case yet [Figure 2].<sup>[16]</sup>

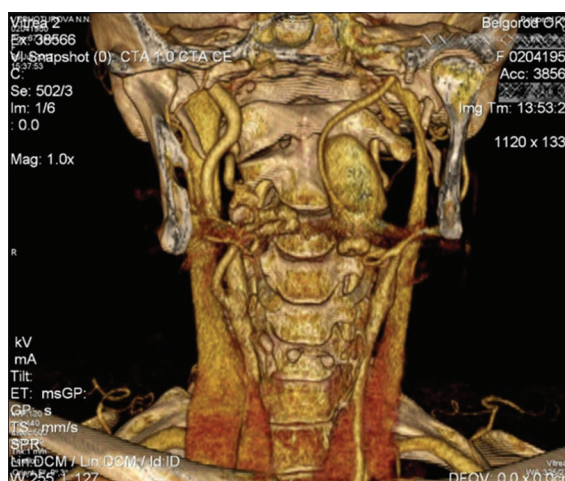
In the clinical observation described by us, a 67-year-old patient had a partially thrombosed fusiform aneurysm of large ICA - >25 mm in diameter. According to literary sources, fusiform aneurysms develop most



**Figure 1:** The post puncture pharyngoscopic view of the paratonsillar area on the left



**Figure 2:** Spiral computed tomography of the head and neck with intravenous contrasting (arterial phase) and coronary projection



**Figure 3:** Three-dimensional reconstruction of the neck arteries (spiral computed tomography of the head and neck with intravenous contrast)



often at the age of about 70–80 years.<sup>[11]</sup> The patient had the combination of arterial hypertension and atherosclerosis, which led to the decrease of elastic fiber number, which, according to many authors, was a predisposing factor of the artery wall deformation and, thus, led to the pathological tortuosity of the ICA and the development of aneurysm [Figure 3].<sup>[2,3,9,17,20]</sup>

## CONCLUSION

An incorrect diagnosis could be made, and inadequate diagnostic and therapeutic measures were performed in the described case: Opening and revision of the paratonsillar space with the trauma of the aneurysm wall, which could lead the patient's death. We advise all otorhinolaryngologists to remember about the possible presence of aneurysm among the patients admitted with the diagnosis of paratonsillitis or paratonsillar abscess. Based on the above clinical case, a detailed approach should be recommended in the differential diagnosis of this category of patients and to perform diagnostic puncture of this lesion before the revision of the paratonsillar space.

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