Venous Malformation Between the External and Internal Jugular Vein Results in Swelling: Multidetector Computed Tomography Imaging

Venous malformation between the external and internal jugular vein characterized by nonfluctant, painless, and nonpulsatile swelling on the right side of his neck while the individual was singing was reported in a 45-year-old man. Interestingly, there was no skin lesion observed on his neck. The swelling increased in size when the patient was shouting (Valsalva maneuver) and diminished in size during periods of rest. Contrast enhanced multi detector computed tomography (MDCT) angiography indicated the presence of a venous malformation between the external and internal jugular vein. The patient was administered a conservative treatment strategy. Notably, only symptomatic malformations or lesions causing important aesthetic prejudice require surgical treatment. In this case, there were no symptoms or aesthetic issues. Thus, we recommend diagnosis using MDCT imaging for vascular malformations at contraindicate magnetic resonance imaging (MRI).

Keywords: Venous malformation, Jugular vein, MDCT angiography

Eksternal ve İnternal Juguler Ven Arasında Şişliğe Neden Olan Venöz Malformasyonun Çok Kesitli Bilgisayarılı Tomografi ile Görüntüleme Bulguları


Özet


Keywords: Venöz malformasyon, Juguler Ven, MDCT anjiografisi

Anahtar Kelimeler: Venöz malformasyon, Juguler Ven, MDCT anjiografisi
Introduction

Vascular malformations are classified as slow-flow malformations such as capillary, venous, lymphatic, capillary-venous, and capillary-lymphatic-venous malformations and high-flow malformations such as arteriovenous fistulas, and arteriovenous malformations. Slow-flow malformations are rare lesions as far as vascular malformations are concerned [1]. Venous malformations are commonly localized near the head. These malformations are generally asymptomatic, but they can cause various symptoms such as pain, swelling and esthetic problems [1]. In this report, we present a fairly rare case of a venous malformation located between the external and internal jugular vein using the results from multi-detector computed tomography angiography imaging.

Case Report

Here in, we report a 45-year-old male amateur singer who experienced swelling on the right side of his neck when he was singing. The swelling had been present all of the patient’s life, but only became noticeable while the patient was singing. Physical examination revealed nonfluctant, painless, nonpulsatile swelling without trill. The swelling intensified with shouting (Valsalva maneuver) and diminished with rest. The findings of an intraoral examination were not helpful in generating a diagnosis.

Cervical examinations and laboratory tests of this patient revealed no noticeable abnormalities. Importantly, Doppler ultrasonography suggested the presence of blood flow. Since the patient suffers from claustrophobia, magnetic resonance (MR) imaging was not performed on the patient. For this reason, we told the patient to sing a song such that the swelling would become obvious on his neck. During the time the patient was singing, dynamic contrast enhanced MDCT angiography was performed. Evaluation of the axial (Figure 1) and 3D volume rendering (Figure 2) MDCT images shows the presence of a venous malformation that causes superficial venous drainage of the occipital and mandibular region to the right side of the neck that connects to the internal jugular vein at the level of the 5th cervical vertebra.

The patient’s condition is being controlled with a conservative treatment strategy.

Discussion

Vascular malformations are classified as either slow-flow malformations (capillary, venous, lymphatic, capillary-venous, and capillary-lymphatic-venous malformations) or high-flow malformations (arteriovenous fistulas, arteriovenous malformations) [1]. Venous malformations are commonly localized near the head. The neck, as in this case, accounts for 40% of the total cases, while the extremities and the trunk account for 40% and 20% of the cases, respectively [1]. Generally, these malformations are characterized by a soft, compressible, and nonpulsatile tissue mass. As a general rule, a survey for venous malformations can occur at any stage in life, but they are often difficult to detect due to their tendency for regression. Growing patterns of these malformations are related to the development of arteriovenous connections and increases in venous volume [2].

Typically, the overlying skin has a bluish tint, but the skin of an affected patient may occasionally appear normal. Most malformations are asymptomatic. Venous malformations typically expand after the Valsalva maneuver and may be flattened with applied pressure. However, the symptoms are related to the size and location of the malformation. Thrombosis, swelling, and pain are common symptoms, yet only symptomatic malformations or lesions that cause important esthetic prejudice require treatment.

In these cases, there were no symptoms eliciting concern, such as pain, although the swelling that occurred after the Valsalva maneuver was disturbing to the patient [1,2].

Vascular malformations can be observed by Doppler ultrasonography, magnetic resonance imaging (MRI) angiography, catheter angiography and multi detector computed tomography (MDCT) angiography. Doppler ultrasonography is essential in differentiating venous malformations from other vascular anomalies. The exploration process begins with a gray-scale examination to delineate the margins of the malformation. Venous malformations appear as hypoechoic or heterogeneous lesions in 80% of cases. Anechoic channels can be visualized in less than 50% of cases. Hyperechoic foci with posterior acoustic shadowing are observed in less than 20% of cases. In most cases, Doppler ultrasonography demonstrates monophasic, low-velocity flow. In 20% of lesions, no flow is demonstrated [3]. In such a situation, the lesion has been observed using Doppler ultrasonography, however, the lesion could not be analyzed regularly due to the presence of...
slow-flow. Nevertheless, we are able to see the spectral and color fullness in the luminal side, and thus, in this case, we cannot ignore the possibility of the existence of a carotid artery pulsation.

Venous malformations are usually characterized as hypo- or iso-intense after T1-weighted MR imaging. Abnormal veins can be observed in the area near the malformation. In T2-weigthed MR imaging, venous malformations display bright signal intensity, with areas of hypo-intensity that are potentially related to thrombosis. In addition, septations inside the malformation of phleboliths can be observed. In T2- weighted MR images, the extension of the malformation into adjacent structures is usually clearly delineated. Gadolinium-enhanced T1-weighted imaging is useful in evaluating the circulatory portion of the malformation. Although MR imaging is very sensitive for identifying and assessing the extension of venous malformations, it is not very specific [1]. Notably, we were not able to evaluate this patient using MR imaging due to the patient’s claustrophobia.

Arteriography is usually not required for the diagnosis of venous malformations. Venous malformations can be only demonstrated via the late venous phases of superselective arteriography [4]. Direct percutaneous phlebography can be performed as a diagnostic procedure in cases of atypical venous malformation. However, in most cases, peripheral limb phlebography is not helpful in the diagnosis of venous malformations of the upper or lower limbs because most of these malformations will not demonstrate opacification [1]. In addition, catheter angiography is restricted due to its invasive nature. For these reasons, the patient was asked to sing a song such that the swelling would present itself on his neck. At the same time, dynamic contrast enhanced MDCT angiography was performed. To our knowledge, this is the first time that a symptomatic case with an aberrant connection between the external and internal jugular veins has been demonstrated using MDCT angiography. MDCT usually displays the localization of the lesions, but it rarely shows the contour of the vascular formations and its relevance to nearby tissues in a non-invasive way.

Medical therapy and other treatment options were not very successful in the past [5]. Conservative options, which include psychotherapy, avoiding traumas, wearing thick clothes and salicylat treatment to prevent thrombosis may in principle be sufficient. Interestingly, it has been reported that the progression of pure venous malformation could be prevented by the administration of conservative treatment only [6]. Intravasküler embolization was not successful in slow-flow vascular lesions. The most important complication of using this technique is the possibility of cutaneous necrosis. Surgical treatment is available in only smoothly contoured and easy accessible lesions. However, there are high rates of recurrence due to the incomplete surgical excision of the lesion. In addition, treatment that injects ethanol into the lesions causes ischemia and necrosis of the peripheral nerves and the cutaneous tissue [7].

In patients with suspicious Doppler ultrasonography results and MRI contraindicated patients, MDCT angiography is an imaging technique that has high resolution and provides helpful information in regard to the diagnosis. This is especially relevant to vascular pathologies such as the case presented herein.

Conflict interest statement The authors declare that they have no conflict of interest to the publication of this article.

References