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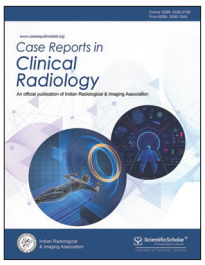

Case Report

Common facial vein aneurysm with tributary to the external jugular vein

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ABSTRACT

Venous aneurysms in the head-and-neck region are relatively rare, and facial vein aneurysms are particularly unusual. The common facial vein typically drains into the internal jugular vein, while anomalous tributaries connecting to the external jugular vein (EJV) are infrequently described. High-resolution ultrasonography with Doppler and contrast-enhanced computed tomography (CECT) play an important role in diagnosing such vascular anomalies and delineating their complex anatomy. We report the case of a 43-year-old female presenting with a long-standing, soft, compressible swelling in the right cheek and neck region. Duplex ultrasound demonstrated a fusiform dilatation with venous flow that was phasic and augmented with Valsalva, and was continuous with the facial venous system. CECT revealed a well-enhancing aneurysmal outpouching of the common facial vein, with communicating tributaries draining into the EJV. No thrombus or secondary cause was identified. A diagnosis of common facial vein aneurysm communicating with the EJV through a tributary was made, and the patient was managed conservatively with a defined follow-up plan. Recognition of variant venous anatomy, including facial–EJV communications, and the combined use of ultrasonography and CECT allow accurate diagnosis and anatomical mapping. Awareness of this rare entity is important to avoid misdiagnosis and to guide appropriate management and surgical planning.

Keywords: Facial vein aneurysm; External jugular vein; Doppler ultrasound; Computed tomography; Cervicofacial venous anomaly

INTRODUCTION

Venous aneurysms represent focal dilatations of veins that involve all layers of the vessel wall. In the cervicofacial region, aneurysms of the jugular veins are more commonly reported; however, aneurysms of the facial venous system remain rare (Martini *et al*).[1] The common facial vein, formed by merging the facial and anterior retromandibular vein, typically drains into the internal jugular vein. Occasionally, variant anatomy exists, such as tributaries from the external jugular vein (EJV) communicating with the facial venous system, which may affect clinical presentation and imaging. Imaging modalities such as duplex ultrasound and contrast-enhanced computed tomography (CECT) are essential not only for diagnosis but also for delineating anomalous vascular communications.

CASE REPORT

Clinical details

A 43-year-old female presented with a soft, non-tender swelling over the right cheek/upper neck region that had been present for the past 12 months. The swelling was noted to increase in size on

Valsalva maneuver and on forward bending. There was no history of facial trauma, neck surgery, catheterization, infection, or any known coagulopathy. On physical examination, the swelling was compressible, measured approximately 4 × 4 cm, was non-pulsatile, and showed no overlying skin changes or associated lymphadenopathy. The swelling was seen to increase in size during Valsalva maneuver, as shown in Figure 1.

Ultrasound with color Doppler was performed using a high-frequency linear transducer (10–15 MHz), scanning along the course of the facial vein and its tributaries with Doppler evaluation. It demonstrated an anechoic saccular outpouching measuring approximately 4 × 3.5 cm, located along the course of the common facial vein. Color Doppler showed low-velocity venous flow with respiratory phasicity and clear augmentation on Valsalva maneuver and distal compression, while spectral Doppler revealed a monophasic, low-resistance venous waveform. Longitudinal and transverse imaging confirmed continuity of the lesion with the proximal and distal segments of the facial venous system, and an additional communicating channel to a superficial vein consistent with an EJV tributary was identified. No intraluminal thrombus was seen. These sonographic features are consistent with previously published literature indicating that duplex ultrasound reliably detects venous aneurysms, demonstrates entrainment with respiration and Valsalva, and confirms continuity with the parent vein (Ilica AT *et al.*).[2] CECT was performed using thin-slice axial imaging in arterial and venous phases with multiplanar reconstructions and maximum intensity projections. Computed tomography (CT) showed dilatation of the right lower internal jugular vein with a well-defined venous abnormality in the mid-neck region. A gross fusiform dilatation of the right common facial vein measuring approximately 28.2 × 29.3 mm was noted, showing iodine enhancement identical to the internal jugular vein on all post-contrast phases. The aneurysmal sac was located anteromedially (ventrally and slightly medially) to the internal jugular vein, with a communicating channel to a superficial vein consistent with an EJV tributary, while the cranial end of the EJV was not visualized on the available imaging dataset. These findings are typical of a fusiform common facial vein venous aneurysm with contribution from an EJV tributary, where venous-phase enhancement, anatomical continuity, and absence of arterial characteristics are key diagnostic features. These imaging findings are illustrated in Figure 2. Based on the imaging findings and absence of secondary causes, a diagnosis of idiopathic common facial vein aneurysm with drainage into the EJV was made. After discussing management options, including observation versus surgical excision, the patient opted for conservative management, which is generally preferred in asymptomatic cases, while surgery is reserved for symptomatic, thrombosed, or cosmetically significant aneurysms. A follow-up plan was established with clinical assessment and repeat duplex ultrasound examinations scheduled at 3 months and 12 months.

DISCUSSION

Anatomical and pathophysiological considerations

The common facial vein, which drains the superficial face, typically empties into the internal jugular vein. Variant anatomy, such as communicating tributaries to the EJV, is less common but clinically and surgically significant because it affects venous hemodynamics and potential routes of drainage.

Venous aneurysms may arise due to congenital weakness, inflammation, trauma, or other predisposing factors. When no cause is evident, the term *idiopathic* is applied (Saleen MI *et al*; Morton L *et al*).[3,4] The existence of a common facial vein aneurysm with drainage to EJV is rare and has been reported only in a few cases or anatomical series, making detailed imaging crucial before any intervention.

Imaging strategy and diagnostic pearls

Duplex ultrasound serves as the first-line investigation in such cases, as it allows non-invasive characterization of the lesion's morphology, assessment of venous flow dynamics including respiratory phasicity and augmentation, and confirmation of continuity with the parent venous segments. CECT plays a complementary and crucial role in detailed anatomical mapping, where multiplanar reformatted images clearly delineate the site of origin, venous drainage pathways such as EJV tributaries, the relationship of the lesion to the internal jugular vein, and help exclude associated complications including thrombosis, vascular compression, or mass effect. A combined ultrasonography + CT approach offers a comprehensive evaluation and guides patient management. Other potential diagnoses for a check/neck swelling are summarized in Table 1.

Figure 1: Clinical photograph of patient showing enlargement of the swelling during Valsalva maneuver

Differential diagnosis

Other potential diagnoses for a cheek/neck swelling should include:

A lesion that shows venous flow on US and venous-phase enhancement with continuity on CT strongly supports a venous aneurysm over these differentials.

Table 1: Differential diagnosis of check/neck swellingwith ultrasound and CT features.

Differential diagnosis	Typical clinical features	Ultrasound/Doppler findings	Key CT findings
Parotid/ Submandibular cyst (e.g., sialocele)	Non-compressible, painless swelling; often post-trauma or surgery; no change with Valsalva	Well-defined anechoic cystic lesion; no internal Doppler flow	Non-enhancing, thin-walled cystic lesion confined to gland or ductal system
Venous malformation	Soft mass since childhood; may enlarge with dependency; sometimes painful	Heterogeneous hypoechoic lesion; slow venous flow; phleboliths may be present	Lobulated, infiltrative lesion; delayed venous filling; phleboliths common; not confined to a single vein
Lymphatic malformation	Soft, often transilluminant swelling; typically present since childhood; no Valsalva effect	Multiloculated cystic lesion; absence of Doppler flow	Non-enhancing, low-attenuation multiloculated mass; may cross fascial spaces
Hemangioma	Common in pediatric age group; may be warm or pulsatile; may regress over time	Mixed echogenicity with marked internal vascularity; arterial and venous waveforms	Intense early arterial enhancement with progressive fill-in on delayed phases
Lipoma/benign soft-tissue tumor	Soft, mobile, non-compressible mass; no change with Valsalva	Echogenic, well-defined avascular lesion	Homogeneous fat attenuation (−80 to−120 HU); no enhancement

CT: Computed tomography

Figure 2: (a) Axial computed tomography (CT) neck venous phase reveals an aneurysmal sac along the course of the right facial vein. Contralateral common femoral vein and its tributaries, mainly the external retromandibular vein and facial vein, are normal in caliber. (b) Sagittal image reveals gross fusiform dilatation of the right common facial vein, with its axis anteriorly and inferiorly. (c) Coronal image reveals gross fusiform dilatation of the right common facial vein and shows iodine enhancement identical to the internal jugular vein on all post-contrast phases. (d and e) Axial CT neck venous phase reveals gross fusiform dilatation of the right common facial vein, with its axis medially and anteriorly. No thrombus or calcification seen. (f) Coronal CT venous phase reveals a communicating channel between the aneurysmal sac and a superficial vein, consistent with an external jugular vein tributary. The CT scan views have been specified in the figure legend as axial, sagittal, and coronal images, and have been checked for correctness.

Complications and management options

Venous aneurysms may be complicated by thrombosis, inflammation, or, rarely, rupture, and due to their superficial location, they may also lead to cosmetic concerns. Management is individualized based on symptoms, size, and progression of the lesion, with conservative follow-up recommended for asymptomatic, stable, and non-thrombosed aneurysms. Surgical excision with ligation of the feeding and draining veins is typically reserved for cases with cosmetic deformity, thrombosis, or rapid increase in size, while endovascular treatment may be considered in rare cases involving deeper or more complex venous anatomy.

CONCLUSION

A common facial vein aneurysm with tributary drainage into the EJV represents a rare vascular variant. Precise imaging using duplex ultrasound and CECT allows accurate diagnosis, reveals anatomical variants such as EJV communication, and helps tailor management. Understanding that the common facial vein drains into the internal jugular vein is critical in planning for surgical or conservative management.

TEACHING POINTS

- Consider venous aneurysm in a compressible, non-pulsatile cheek/neck swelling that augments on Valsalva.
- Duplex ultrasound: Shows anechoic dilatation, venous flow, respiratory phasicity, and venous continuity.
- CT (venous-phase): Confirms lesion's venous nature, continuity with facial and jugular veins, and presence of variant tributaries.`
- Recognition of variant drainage (e.g., EJV tributaries) is essential for diagnosis and surgical planning.

MCQ 1

A long-standing, compressible cheek–neck swelling increases in size on Valsalva maneuver. Duplex ultrasound demonstrates venous flow with respiratory phasicity and augmentation. Which CT finding best helps distinguish a facial vein venous aneurysm from a venous malformation?

A. Multiloculated low-attenuation mass crossing fascial planes
B. Delayed enhancement with internal phleboliths
C. Focal fusiform dilatation showing venous-phase enhancement with continuity to a single named vein
D. Heterogeneous lesion with infiltrative margins

Correct Answer: C

Explanation:
Venous aneurysms present as focal saccular or fusiform dilatations with direct continuity to a single vein and venous-phase enhancement, whereas venous malformations are typically infiltrative, multiloculated, and often contain phleboliths.

MCQ 2

Which of the following Doppler ultrasound findings is most characteristic of a venous aneurysm of the facial venous system?

A. High-velocity arterial waveform with low resistance
B. Absence of Doppler flow within the lesion
C. Monophasic low-velocity venous waveform with augmentation on Valsalva
D. Turbulent flow with aliasing and color bruit

Correct Answer: C

Explanation:
Venous aneurysms demonstrate slow venous flow, respiratory phasicity, and augmentation with Valsalva or distal compression, confirming venous origin and patency.

MCQ 3

Regarding the normal and variant anatomy of the facial venous system, which statement is MOST accurate?

A. The common facial vein normally drains into the external jugular vein
B. Facial vein aneurysms commonly have arterial feeders
C. Variant communication between the common facial vein and the external jugular vein can alter venous drainage patterns
D. The facial vein has no surgical relevance due to its superficial location

Correct Answer: C

Explanation:
The common facial vein normally drains into the internal jugular vein. Variant communications with the external jugular vein are uncommon but clinically significant, especially for imaging interpretation and surgical planning.

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