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Saccular neck venous aneurysm on color duplex sonography: an analysis of 12 cases

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Abstract

Objective: To discuss the characteristics of saccular neck venous aneurysm on color duplex sonography. **Methods:** We retrospectively reviewed 12 cases of saccular neck venous aneurysm confirmed by either venogram or surgical pathology. Clinical information, physical exam of the neck, and characteristics of saccular neck venous aneurysm on color Doppler sonography (CDUS) were analyzed. Diagnosis and differential diagnosis of saccular venous aneurysm on color duplex sonography were discussed. **Results:** The communication between saccular venous aneurysm and related vein was visualized on grayscale imaging in 11 cases (11/12), which was observed in all 12 cases (12/12) on color Doppler image. Spectral Doppler was useful in the demonstration of venous flow in both the communicating vein and venous aneurysm. The documentation of venous flow in both venous aneurismal sac and communicating vein was obviously improved with contrast enhanced ultrasound in one case. **Conclusion:** It is important to have knowledge of venous aneurysm, an uncommon condition in sonographic practice. Saccular venous aneurysm should be taken into consideration in differential diagnosis when a cystic lesion in the neck appears on color Doppler sonography.

Keywords: Color Doppler sonography; Jugular vein; Venous aneurysm

1. Introduction

Venous aneurysm is a localized area of venous dilatation, which is not to be associated with arteriovenous malformations or contained within a segment of varicose vein [1–3]. However, some authors have described venous dilatation as phlebectasia rather than as venous aneurysm [4–8].

Venous aneurysm in the neck is a relatively rare condition. Most publications on this subject were single-case reports of fusiform neck venous aneurysm [4–14]. There were only a few cases reported as saccular neck venous aneurysm [6,7]. In this article, we reported the clinical manifestation, characteristics of color Doppler sonography (CDUS), and correlation between appearance on CDUS and findings of venography or surgical pathology in 12 cases of saccular neck venous aneurysms.

2. Materials and methods

2.1. Clinical materials

We retrospectively reviewed 12 cases with venous aneurysm of the neck from 12 different medical institutes in China between September 2000 and October 2006. Twelve patients (five men and seven women; age range, 9–70 years) were admitted with initial diagnosis of soft neck lumps. Medical records, images of CDUS, result of venography, and reports of surgery and pathology in all 12 cases were reviewed and analyzed. The clinical features of 12 cases with neck venous aneurysm are summarized in Table 1.

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Table 1
Clinical features of 12 cases with neck venous aneurysm

Patient serial number	Gender	Age	Chief complaint	History of trauma
1	Female	36	Incidental finding of lump in the anterior aspect of neck 2 years ago and increase in size gradually	Deny
2	Male	32	Incidental finding of left neck lump for a week	Deny
3	Female	32	Incidental finding of left neck lump for a month	Deny
4	Female	50	Incidental finding of right neck lump for 2 years	Deny
5	Female	39	Incidental finding of left neck lump for a week	Deny
6	Male	56	Incidental finding of right neck lump for 2 days	Deny
7	Male	17	Incidental finding of right neck lump for a year	Deny
8	Female	32	Incidental finding of right neck lump for a week	Deny
9	Male	9	Right uncomfortable neck with occasional headache for 1 week	Deny
10	Female	29	Left neck small lump for 2 years, which became hard lasting a few days	Deny
11	Male	34	Right neck lump following sprain of neck 2 days ago	Sprain
12	Female	70	Right neck lump fol1owing rope compression of the right neck and increase in lump size gradually	Compression

2.2. Color Doppler sonography

Color Doppler sonography was performed in all cases prior to the surgical intervention. Patients were on supine position. High-frequency linear transducer 15L8w (Sequoia 512, Siemens Medical Solutions, Germany), L15-5 (ATL HDI 5000, Philips Ultrasound, USA) or 12L (Logiq 9, GE Medical Systems Ultrasound, USA) was used. The examination included grayscale image, color Doppler image, and spectral Doppler. Lower pulse repetition frequency was applied to detect slow venous flow in the communicating vein and venous aneurysm sac. Total color Doppler gain was set at maximum without aliasing. Contrast enhanced ultrasound was performed in one case. Focal zone of ultrasound was allocated at a level lower than the area of interest, and the mechanical index (MI) was set at 0.08–0.10. Low dynamic range with high-contrast postprocessing was used on grayscale images to optimize the wall of the communicating vein. SonoVue (Bracco, Italy) was used at a total dose of 1 ml and followed by 5 ml of saline injection. Administration of the same dose of the contrast agent was repeated with 15-min intervals between injections.

3. Results

3.1. Clinical manifestations

All patients had soft lump in the neck, which was located on the right (seven cases), the left (four cases), and in the middle line (one case). The size of the lump decreased with digital compression and which increased when the compression was released. The lump was getting larger on supine position compared with that on sitting or standing position. The size of the lumps was increased with straining, laughing, coughing, and Valsalva maneuver. The characteristics of the lumps included absence of pulsate, tenderness, bruits, or

Table 2
Sonographic appearance of neck saccular venous aneurysm in 12 cases

Patient serial number	Venous aneurysm size (cm)	Venous aneurysm sac on grayscale image	Venous aneurysm wall on grayscale image	Diameter of the communication* on grayscale image (cm)	Presence of color Doppler signals at the communication*
1	3.5×3.3×2.2	No echo	Thin and smooth	0.3	Yes
2	5.0×2.7	Floating echo	Thin and rough	0.6	Yes
3	1.3×0.7	“Cloudy” echo	Thin and smooth	0.16	Yes
4	2.7×1.1	No echo	Thin and smooth	Not measured	Yes
5	3.2×1.1	“Cloudy” echo	Thin and smooth	0.3	Yes
6	2.5×2.0×0.9	No echo	Thin and smooth	0.25	Yes
7	4.3×2.9×2.5	“Cloudy” echo	Thin and smooth	0.5	Yes
8	2.8×1.2	“Cloudy” echo which moved with respiration	Thin and smooth	0.6	Yes
9	4.7×1.2×2.5	No echo	Thin and smooth	0.6	Yes
10**	3.4×2.3×1.6	Floating echo	Thin and smooth	Not measured	Yes
10***	3.4×3.0×1.5	Homogeneous echo	Thin and not smooth	–	No color Doppler signals
11	3.43×1.42	Heterogeneous cystic mass	Thin and rough	0.21	Yes
12	3.0×3.0	Heterogeneous cystic mass	Thin and smooth	Not visualised	Yes

*Communication between the venous aneurysm and associated vein; venous waveform was demonstrated at communication on spectral Doppler in 12 cases, except in 10***; **first visit; ***second visit before treatment.