Case Report

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대한영상의학회지

Brachiocephalic Venous Aneurysm Mimicking Metastatic Cervical Lymphadenopathy in a Patient with Gastric Cancer: A Case Report

위암 환자에서 경부 전이성 림프절로 오인될 수 있는 팔머리정맥류: 증례 보고

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Brachiocephalic venous aneurysm (BVA) development is an extremely rare, particularly as a primary vascular disorder. BVAs may be misinterpreted as lymphadenopathies owing to the variable degrees of enhancement seen in imaging studies, especially among patients with underlying malignancy. We report a BVA that mimicked lymph node metastasis on CT in a 60-year-old female who had undergone subtotal gastrectomy for stomach cancer. After follow-up chest CT with different bolus times and Doppler ultrasonography, a venous aneurysm originating from the brachiocephalic vein was diagnosed. We emphasize that, to make an accurate diagnosis, physicians should be aware of the potential diagnostic pitfalls and have a high index of suspicion for BVA when encountering certain lesions in the cervical area.

Index terms Brachiocephalic Vein; Metastasis; Lymph Node; Aneurysm

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INTRODUCTION

Brachiocephalic venous aneurysm (BVA) is an extremely rare vascular disorder (1) that could occur in the cervicothoracic and abdominopelvic vein as well as in the veins of the extremities. It may be congenital or acquired after trauma or inflammation (2). The primary variety of BVA is especially rare. Compared to high-pressure arterial sys-

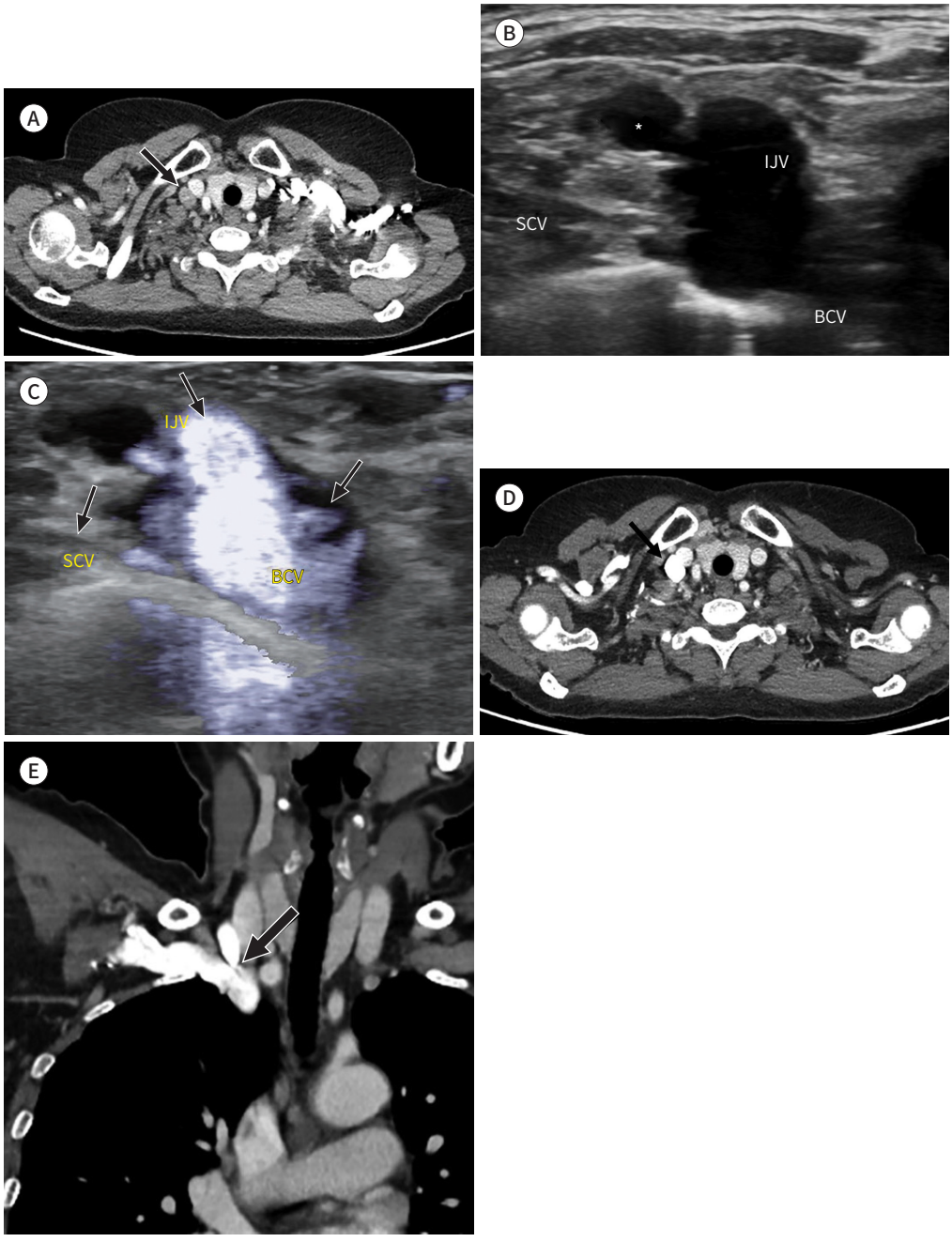
tems, the low pressures encountered in veins are biomechanically less conducive to aneurysm formation, particularly in the absence of cardiovascular disease or trauma history. Large venous aneurysms in the cervical area commonly manifest as palpable swellings, whereas smaller aneurysms are more difficult to detect and distinguish from other solid tumors. Differentiation of a venous aneurysm from a solid tumor is important for the proper management of the disease. Herein, we describe a case of a venous aneurysm arising from the brachiocephalic vein mimicking supraclavicular lymph node metastasis (LNM) in a patient with stomach cancer.

CASE REPORT

A 60-year-old female presented with a gastric mucosal mass that was incidentally detected upon screening gastroscopy. Gastroscopy revealed a protruding mucosal mass, about 40 mm in diameter, with ulceration at the anterior wall of the distal body of the stomach. The patient underwent endoscopic biopsy, and the signet ring cell carcinoma was diagnosed after histopathologic examination. CT of the abdomen was performed to establish the stage of the tumor. The tumor was confined to the wall of the stomach with no evidence of perigastric invasion. There were no enlarged regional lymph nodes. The patient underwent distal subtotal gastrectomy with gastroduodenostomy. On histopathologic examination, the tumor was noted to invade the muscularis propria, and there was one regional LNM. Because the pathologic stage was IIA, the patient was initiated on adjuvant chemotherapy.

After 6 months following surgery, abdominal and chest CT scans were performed to investigate potential recurrence or metastasis. The abdominal CT revealed no local recurrence or distant metastasis. However, the chest CT revealed an ovoid nodular lesion in the right supraclavicular area between the subclavian and the internal jugular veins. The lesion measured 14 × 9 mm and showed mild heterogeneous enhancement (Fig. 1A). The initial interpretation of the radiologic findings was a suspicion of metastatic lymphadenopathy. Follow-up ultrasonography revealed a hypoechoic nodular lesion in the right supraclavicular area communicating with the brachiocephalic vein (Fig. 1B). Also, retrograde filling of the vascular flow from the brachiocephalic vein into the lesion was identified on color Doppler ultrasonography (Fig. 1C). We assumed that the lesion was an aneurysm of the right brachiocephalic vein and decided to follow up. Follow-up chest CT was performed 6 months after the initial chest CT. For the follow-up examination, contrast was injected through the right antecubital vein as opposed to the initial study, wherein the contrast was injected through the left antecubital vein. The lesion showed no interval change in size and shape but showed intense homogeneous enhancement identical to that of the subclavian and brachiocephalic veins (Fig. 1D, E). We assumed that the change in the pattern of lesion enhancement was due to the change in contrast injection site; in other words, the different bolus timing led to the different enhancement pattern. Finally, venous aneurysm of the right brachiocephalic vein was diagnosed. As there was no change for 6 months, and the patient did not complain of any symptoms, we opted for follow-up rather than surgical or interventional treatment.

Fig. 1. Radiologic findings of brachiocephalic venous aneurysm in a 60-old-female with gastric cancer, mimicking metastatic lymphadenopathy.
A. Chest CT after subtotal gastrectomy shows an ovoid nodular lesion with mild heterogeneous enhancement (arrow) in the right supraclavicular area. The contrast agent was injected through the left antecubital vein.
B. Grayscale ultrasonography of the neck shows the communication between the lesion (*) and BCV.
C. Color Doppler ultrasonography of the neck shows retrograde filling of the vascular flow from the BCV into the lesion (arrows).
D. Follow-up CT of the chest with a 6-month-interval shows the previous lesion with intense homogeneous enhancement (arrow), which is identical to that of the subclavian and BCVs. The contrast agent was injected through the right antecubital vein.
E. Coronal image shows the communication between the lesion and BCV (arrow).
BCV = brachiocephalic vein, IJV = internal jugular vein, SCV = subclavian vein



DISCUSSION

Venous aneurysms are uncommon, and the clinical significance of this disease is not clearly known. Venous aneurysms are classified and divided into congenital and acquired lesions after trauma or inflammation (2). These lesions are further classified into primary causes and secondary causes, such as trauma or factors that can influence the modification of venous structures. Fewer than 20 primary BVAs have been reported. Most of the previously reported cases were asymptomatic; however, chest pain and tenderness have been reported (3). Palpable cervical swellings are commonly encountered in association with large BVAs, whereas small BVAs are difficult to detect and distinguish from other solid or cystic tumors. Although primary abdominal or pelvic malignancies are more likely to metastasize to the left supraclavicular area, the differential diagnosis of for a neck mass should include solid masses, such as reactive lymph node hyperplasia or metastatic lymphadenopathy as well as cystic masses, such as branchial cyst, thyroglossal duct cyst, or cystic hygroma (4).

Venous aneurysms can be detected using ultrasonography, CT with contrast enhancement, and MRI. CT images are helpful in the detection of combined congenital anomalies and complicated aneurysms, such as those associated with thromboembolism (5). On CT, venous aneurysms can show variable degrees of enhancement depending on bolus timing. When appearing as soft-tissue attenuation, venous aneurysms can simulate pathologic structures, most commonly lymph nodes. Additional images acquired after a short delay may reveal homogeneous venous enhancement, leading to a confident diagnosis. Also, the identification of communication between a lesion and a vein usually clarifies the diagnosis (6). There have been several misdiagnosed cases resulting in unnecessary procedures or treatment. Huang and Jiang (7) reported a case of left innominate venous aneurysm, which was mistaken for thymoma that was surgically resected. Buehler et al. (5) reported a case of left innominate venous aneurysm, which was initially mistaken for a solid mass, so unnecessary CT-guided needle biopsy was performed (7). Interestingly, venous aneurysms could have variable enhancement depending on the side of contrast injection, which affects bolus timing, and this is an important diagnostic pitfall. Common to the case reported by Buehler et al. (5) and our case, the venous aneurysm enhancement was mild and heterogeneous when contrast was injected to the side contralateral to the aneurysm. The typical enhancement seen with venous aneurysms appeared when the contrast was injected to the side ipsilateral to the aneurysm. Thus, to avoid this pitfall, follow-up CT with contrast injected to the ipsilateral side of the lesion would be one method to exclude venous aneurysm when a solid cervical mass is found. On ultrasonography, identifying the origin of the lesion usually distinguishes vascular structures from non-vascular lesions. When the origin is hard to establish on grayscale images, color Doppler studies may be helpful by demonstrating characteristic vascular flow.

BVA treatment decisions depend on multiple factors, especially patient factors. Asymptomatic and unchanged BVAs can be observed with regular follow-up imaging (3). When the venous aneurysm causes symptoms or increases in size on follow-up imaging, surgical management should be considered (8, 9). In our case, we opted for observation after multidisciplinary discussions. Our rationale was that the BVA was asymptomatic and showed no interval changes during follow-up.

As venous aneurysms can show various degrees of enhancement on imaging depending on bolus timing, they can be mistaken for lymphadenopathy among patients with underlying malignancy. Such misinterpretation may lead to erroneous or unnecessary treatment, which could put patients at risk. When encountering suspicious lymphadenopathy in patients with underlying malignancy, it is important to be aware of pathologic conditions that can affect the cervical area and to acknowledge the possible pitfall of bolus timing to avoid misdiagnosis. CT with different bolus timing or Doppler ultrasound are great aids for reaching a correct diagnosis.

Author Contributions

Conceptualization, L.J., L.H.; data curation, all authors; formal analysis, R.M.J., L.J.; investigation, R.M.J., L.J.; project administration, L.J.; resources, L.J., L.H.; supervision, L.J.; visualization, all authors; writing—original draft, R.M.J.; and writing—review & editing, L.J.

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

REFERENCES

1. Dua SG, Kulkarni AV, Purandare NC, Kulkarni S. Isolated left innominate vein aneurysm: a rare cause of mediastinal widening. *J Postgrad Med* 2011;57:40-41
2. Schatz IJ, Fine G. Venous aneurysms. *N Engl J Med* 1962;266:1310-1312
3. Hosaka A, Kato M, Kato I, Isshiki S, Okubo N. Brachiocephalic venous aneurysm with unusual clinical observations. *J Vasc Surg* 2011;54:77S-79S
4. Ekim H, Özen S. Primary venous aneurysm of the external jugular vein. *East J Med* 2002;7:24-25
5. Buehler MA 2nd, Ebrahim FS, Popa TO. Left innominate vein aneurysm: diagnostic imaging and pitfalls. *Int J Angiol* 2013;22:127-130
6. Escott EJ, Branstetter BF. It's not a cervical lymph node, it's a vein: CT and MR imaging findings in the veins of the head and neck. *Radiographics* 2006;26:1501-1515
7. Huang W, Jiang GN. A rare case of left innominate vein aneurysm mimicking thymoma. *Interact Cardiovasc Thorac Surg* 2017;25:669-670
8. Hosein RB, Butler K, Miller P, Jones T, Brawn WJ, Barron DJ. Innominate venous aneurysm presenting as a rapidly expanding mediastinal mass. *Ann Thorac Surg* 2007;84:640-642
9. McCready RA, Bryant MA, Divelbiss JL, Chess BA. Subclavian venous aneurysm: case report and review of the literature. *J Vasc Surg* 2007;45:1080-1082

대한영상의학회지

위암 환자에서 경부 전이성 림프절로 오인될 수 있는 팔머리정맥류: 증례 보고

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팔머리정맥류는 극히 드문 혈관질환으로서 선천성, 혹은 외상이나 염증 등의 후천성 원인에 의해 발생한다. 팔머리정맥류는 영상검사에서 다양한 정도의 조영증강을 보이기 때문에 암 환자에서 경부 전이성 림프절로 오인 될 수 있다. 본 증례에서는 위암으로 위부분절제술을 받은 60세 여환에서 시행한 흉부 컴퓨터단층촬영에서 우측 빗장위부위에 조영증강되는 결절성 병변이 발견되었다. 전이성 림프절의 가능성을 고려하여 도플러 초음파 및 추적 컴퓨터단층촬영을 시행하였고 팔머리정맥에 생긴 정맥류로 진단하였다. 본 저자들은 암 환자에서 경부 전이성 림프절로 의심되는 병변이 발견되었을 경우 팔머리정맥류의 가능성도 고려할 수 있어야 함을 강조한다.

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