Case Report

Coil embolization for a vast and complex arteriovenous malformation in the posterior mediastinum

Jun Li, Hui Liu, Ling Ye

Department of Anesthesiology and Translational Neuroscience Center, West China Hospital, Sichuan University, Chengdu 610041, Sichuan Province, P. R. China

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Abstract: Arteriovenous malformation (AVM) is a kind of life threatened disease. Especially AVM in the posterior mediastinum is a rare, painful and it is difficult for treatment. We report a 44-year-old male patient who developed arteriovenous malformation (AVM) in the posterior mediastinum. The patient complained 3 years of mild left back pain and chest congestion, and his pain increased over the last 3 months. Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) examinations showed an enhancing vascular lesion in the left posterior mediastinum which in contact with the descending thoracic aorta. It was initially misdiagnosed as lung mass. It was considered to be vascular malformations. His pain was completely resolved after steel coil embolization was successfully administered.

Keywords: Arteriovenous malformations, posterior mediastinum, back pain

Arteriovenous malformation (AVM) is a kind of life threatened disease which is an abnormal connection between arteries and veins bypassing the capillary system. Especially AVM in the posterior mediastinum is a rare, painful disease generally with a history of trauma. The clinical features of this kind of malformation include severe back pain, chest congestion. Only a few cases were reported [1, 2]. Posterior mediastinal AVMs are always asymptomatic and most patients are found coincidentally during routine examinations. Only a few cases of these posterior mediastinal arteriovenous malformations may cause symptoms when they compress the surrounding structures after becoming enlarged [3].

The computerized tomography (CT) and magnetic resonance imaging (MRI) can be useful tools for visualizing the relationship of the mass with the surrounding tissues and vessels [4]. But it may be not enough in some cases because their vascular nature and diagnostic needle biopsy may have a high risk of bleeding. Digital subtraction angiography (DSA) may be a useful method in this situation [5]. Treatment for AVM is very difficult. Surgical resection and coil embolization are both choices for the AVMs treatment [4].

In this case report, we illustrated a vast and complex AVM in the posterior mediastinum. This case was initially misdiagnosed as lung mass. Steel coil embolization was successfully administered and we saved his life.

Case report

A 44-year-old man with a 3 years’ history of mild left back pain and chest congestion, and his pain increased over the last 3 months. There was no history of dyspnea, cough, sputum, hemoptysis, or previous trauma. It was the first time that he complained for these symptoms. His past medical history was no special, and he was in general good condition. The physical examination, routine blood test, electrocardiogram were normal.

Written consent was obtained from the patient. A chest radiogram showed a large well-defined mediastinal mass in the left hemi-thorax. Further investigation with computer tomographic (CT) demonstrated a 5.5 × 4 × 4 cm intense enhancing homogeneous mass in the left pos-
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terior mediastinum (Figure 1A). He was initially misdiagnosed as lung mass and a biopsy was scheduled for the patient. But the magnetic resonance imaging (MRI) showed an enhancing vascular lesion, in contact with the descending thoracic aorta and drainage veins are hemiazygos vein and vertebral venous plexus (Figure 1B). The imaging characteristics were considered to a vast and complex vascular malformation. Then steel coil embolization under digital subtraction angiography (DSA) was scheduled for the patient.

Procedure

DSA showed a sufficient defined lesion with early arterial enhancement. The feeding artery was originating from the root of the 8th intercostal artery which is the branch of the descending thoracic aorta (Figure 2A). And the drainage veins are hemiazygos vein and vertebral venous plexus. The patient didn’t want to be operated on, so selective catheterization and angiography of the lesion was administered to visualize clearly and steel coils emboli-

Figure 1. A. Contrast-enhanced CT scan shows a large posterior mediastinum mass with homogeneous enhancement. B. Magnetic resonance imaging (MRI) shows a vascular lesion with intense enhancement in contact with the descending thoracic aorta and drainage veins are hemiazygos vein and vertebral venous plexus.

Figure 2. A. Digital subtraction angiography, shows the enhanced vascular lesion. The feeding artery was originating from the root of the 8th intercostal artery (noted by arrow) which is the branch of the descending thoracic aorta. B. After embolization the abnormal vascular lesion can’t be seen.
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Figure 3. Post-Embolization CT finds a mass without enhancement in the left posterior mediastinum within a pleural effusion. The drainage veins didn’t appear.

zation was used as an alternative of open surgery for reducing the risk of hemorrhage during surgery. After embolization the abnormal vascular lesion can’t be display (Figure 2B).

After embolization, CT showed a mass without enhancement in the left posterior mediastinum within a pleural effusion. The drainage veins disappear (Figure 3). The post-Embolization course was uneventful. The pain was completely relieved, Visual Analogue Scale (VAS) was 0/10. There was no evidence of recurrence after two-years of follow-up.

Discussion

In 1982, a new biological classification of vessel lesions was proposed by Mulliken and Glowacki [6]. They deemed all lesions were classified into two broad categories based on endothelial cell characteristics: hemangiomas and vascular malformations [6]. According to the different types of vessel, vascular malformations may contain any combination of capillary, arterial, venous, lymphatic and so on. This classification was updated to divide vascular birthmarks into vascular tumors and malformations in 1996 [7].

Mediastinal vascular malformations are very rare, most commonly seen in the anterior mediastinum, and there are only few cases reported before [8]. Vascular malformations are structural abnormalities of vessels. They will continue to grow up with patient’s growth and development. It will have a serious impact on the structure and function of the patient [9]. They can exist in any organ or tissue, especially in extremities. Our case is a Arteriovenous malformations (AVMs) in posterior mediastinum. It is an abnormal connection between arteries and veins without capillary vessels. Most mediastinal AVMs are asymptomatic, the symptoms are depending on the dimensions, location and a history of trauma. But, if they are enlarged or ruptured, it will be catastrophic results [10].

CT and MR imaging can be a useful tools for visualizing the relationship of the mass with the surrounding tissues and vessels, but they may be insufficient for detection of the vascular origin [11]. In this case, the patient had an increasingly back pain, CT and MR imaging finds a big mass in posterior mediastinum, considered to a AVMs. Other vascular malformations (hemangiomas, lymphangiomas), tumors and extra lobar pulmonary sequestration have to be kept in mind for differential diagnosis. They all have characteristic image and clinical manifestation [12]. Diagnostic needle biopsy is very hazardous in our case, it will make the vessel rupture and threat to life. Digital subtraction angiography may be a useful method in this situation [13].

Management of vascular malformations is challenging. No symptom cases can be followed conservatively without any intervention. Surgical resection and embolization are both choices for the AVMs treatment. A preoperative embolization of big lesions can decrease the amount of surgical bleeding [14]. In our case, we have performed a successful embolization because the patient didn’t want to take a surgical resection.

Conclusion

In conclusion, vascular malformations in posterior mediastinal are very rare, it is often difficult to diagnose and classify. In this case, the patient had an increasingly back pain which is a common compliant in the daily pain management. But, the reason is very complex. So, we are required to analyze the clinical manifestations comprehensively, combine with the correct image examination, choose the rational choice of treatment, and avoid the unnecessary and dangerous medical measures.

Disclosure of conflict of interest

None.
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Address correspondence to: Dr. Ling Ye, Department of Anesthesiology and Translational Neuroscience Center, West China Hospital, Sichuan University, Chengdu 610041, Sichuan Province, P. R. China. Tel: 86-28-85423593; E-mail: zerodq_hx@163.com

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