A Rare Cause in an Adolescent with Chest Pain: Right Intrathoracic Subclavian Artery Aneurysm
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CASE REPORT

A 17-year-old previously healthy boy presented to the emergency department with severe cough. The patient had no significant medical and trauma history, and denied any family history associated with cardiovascular disease. Sudden onset of severe cough attacked to him in the night before admission. Right chest pain and loss of consciousness for several seconds then happened later. However, episodes of severe cough persisted.

Physical examination showed non-tender swelling over right neck and decreased breathing sound in right lung. Chest radiography revealed swelling in soft tissue of right neck, opacity of right upper lobe, and widening of mediastinum (Figure 1). He was diagnosed with pneumonia and empiric antibiotics were given. Patient subsequently underwent chest computed tomography (CT) due to persistent severe cough, unusual right chest pain, and elevated D-dimer level (859 ng/ml). The CT scan revealed the contained rupture of a 2.0 cm-sized right intrathoracic subclavian artery aneurysm, just below the level of takeoff of right vertebral artery, with hematoma formation in right neck, right upper lobe, and mediastinum (Figure 2). The survey of anticardiolipin, anti-neutrophil, and anti-nuclear antibodies all showed negative finding.

Patient then went through angiography with endovascular repair at the third day of hospitalization. Percutaneous access was obtained through right brachial artery, and a pigtail with 0.035In Glidewire guide wire (Terumo, Leuven, Belgium) was advanced into ascending aorta. A Fluency stent graft (Bard Nordic, Helsingborg, Sweden), with a diameter of 12 mm and a length of 60mm, was placed to cover the pseudoaneurysm (Figure 3). On follow-up after three months, the opacity of right upper lobe and widening of mediastium resolved in repeated chest radiography.

DISCUSSION

Chest pain in children is a common complaint in children. Study have demonstrated that the most common causes of chest pain among children are benign idiopathic, musculoskeletal, gastrointestinal, pulmonary, or psychogenic, with cardiovascular causes being quite rare.1
True aneurysm is closely related to atherosclerotic change. Other causes, including cystic medial necrosis, mycotic process, aberrant subclavian artery, and some connective tissue disorders, have been reported. However, pseudoaneurysm is usually resulted from trauma injury and iatrogenic penetration.

In terms of their location, subclavian aneurysms can be classified into intrathoracic and extrathoracic type. Extrathoracic subclavian aneurysm was more often found than the intrathoracic type. Intrathoracic aneurysms are related to atherosclerosis, but extrathoracic type is mainly resulted from thoracic outlet syndrome or trauma. In the case we reported, intrathoracic pseudoaneurysm was shown in angiography. Patient denied any blunt and iatrogenic trauma history, and no any evidence showed that there was atherosclerotic change in this adolescent. The etiology still needs further investigation.

The clinical manifestations of subclavian artery aneurysm are closely related to the occurrence of complication and the position of aneurysm. The complications include rupture, thrombosis, or upper limb embolism. Rupture of aneurysm can cause sudden onset of chest or shoulder pain, and result in intrathoracic or extrathoracic bleeding. Tender pulsatile mass in superior fossa usually presents in extrathoracic aneurysm. Intrathoracic aneurysm is often asymptomatic, but it can be symptomatic when compression or acute aneurysm extension occur. Symptoms include such as chest or shoulder pain,
hemoptysis, tracheal compression, dysphagia, Horner’s syndrome, or branchial plexipathy.\textsuperscript{3,8,9} Physician should aware of the possibility of multiple aneurysms because some studies revealed that 30-47% of these patients have multiple aneurysms.\textsuperscript{7,10}

Chest pain is a common complaint among children and adolescents. In a systemic review, cardiovascular origin contributed to around 10% of the etiology of chest pain.\textsuperscript{11} However, cardiovascular problems are more commonly found in adolescents who present to emergency department than in younger children.\textsuperscript{12} To diagnose an adolescent with chest pain, a thorough history-taking can reveal the etiology in most cases. In the patient we reported, sudden-onset chest pain with syncope is significant and may related to the cardiovascular origin.

The natural history of subclavian artery aneurysm is still unknown. If we keep observation for subclavian artery aneurysm, aneurysm has been reported to grow at the rate of 0.42 to 1.31 cm/year.\textsuperscript{13,14} Historically, treatment is usually surgical intervention. Extrathoracic aneurysm almost all can be managed through a supraclavicular approach.\textsuperscript{8} When the aneurysm is intrathoracic or large, it requires sternotomy or thoracotomy. To replace the aneurysmic subclavian artery, prosthetic or autologous grafting were used in most case series.

In 1991, Becker et al. described an intraluminal stent graft to treat subclavian artery hemorrhage.\textsuperscript{14} From then on, there is considerable interest to use endovascular graft to treat subclavian artery aneurysm, especially in high-risk patients.\textsuperscript{6,17} In this patient, acute intrathoracic bleeding was resulted from the rupture of subclavian aneurysm. Although contained rupture of aneurysm was found in angiography. The risk of re-bleeding warranted choosing endovascular treatment.

We describe an adolescent who complained of chest pasmin and syncope due to a contained rupture of right intrathoracic subclavian artery aneurysm. We treated him with endovascular stent grafting because of the risk of re-bleeding of aneurysm.

REFERENCES


