Traumatic Pseudoaneurysm of the Pulmonary Artery: Case Report and Review of the Literature

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Pulmonary artery pseudoaneurysm is a very rare but potential complication of chest trauma. These aneurysms are usually produced by penetrating trauma although a few cases have been reported after blunt injury. They should be suspected if there is a persistence of opacity on chest radiograph that when evaluated by contrast-enhanced CT shows an increased opacification of the mass. Diagnosis is confirmed with a pulmonary arteriogram.

Despite the high increase in chest injuries post-traumatic pulmonary artery pseudoaneurysm is quite unusual. Only 12 cases have been reported in the English literature. Hemoptysis is the most common symptom. The patient may present with dyspnea, chest pain, and hypoxia or may be asymptomatic. Although the majority of cases reported were secondary to penetrating trauma a few cases have been described after blunt trauma. This condition should be suspected if there is a persistent opacity on the chest radiograph in the weeks, months, or years after a chest injury. Angiography is the best modality for diagnosis and embolization can be performed at the same time for treatment. We report a case of post-traumatic pulmonary artery pseudoaneurysm with review of the literature.

Case Report

A 17-year-old male was rapidly transported to our institution in May 1996 with a single gunshot wound to the left chest. He was unresponsive at the scene with barely palpable pulse and agonal respiration. He had no vital signs on arrival to the Emergency Department. He was resuscitated following the Advanced Trauma Life Support protocol. Inspection revealed a single entry wound at the second left intercostal space in the anterior axillary line with no exit. Emergent left anterolateral thoracotomy was performed revealing a large hemothorax (approximately 2 liters); no cardiac injury was noted on pericardiectomy. Open cardiac massage was carried out with reestablishment of the vitals signs. Further chest exploration revealed a left hilar hematoma and a through and through wound to the pulmonary artery and upper lobe segment of the left lower lobe. A lingulectomy was performed and the posterior wound repaired. He remained intubated and a tracheostomy was performed to facilitate airway toilet and improve oxygenation. The chest radiograph initially showed a hazy density in the left lower lobe attributed at that time to lung contusion and blast injury. This later underwent consolidation and was diagnosed as pneumonia. After 2 weeks of antibiotics the sepsis resolved but the hypopnea persisted. He also developed hemoptysis. Serial chest radiographs showed a persistent well-circumscribed density in the left mid-lung area (Fig. 1). On the CT scan it appeared as a markedly enhanced homogeneous density in the left lower lobe (Fig. 2). Possible differential diagnoses included: hematoma, abscess, arteriovenous fistula, pseudoaneurysm, and pneumonia. Bronchoscopy with lavage showed no obstruction or mucopurulent discharge. Pulmonary angiography showed a 4-cm spherical lesion with several feeding vessels arising from the pulmonary artery (Fig. 3). A late phase of the study demonstrated clearing of the density and opacification of the branches of the pulmonary vein (Fig. 4). These findings were compatible with a pseudoaneurysm.

The patient’s condition did not improve with conservative management. The hemoptysis persisted and he remained hypoxic. He was taken to the operating room for a left thoracotomy. The left lower lobe was compressed by a 6-cm cystic mass, which was a pseudoaneurysm of the basal artery. The lung tissue surrounding it was totally atretic. A left lower lobectomy was performed. The gross pathology confirmed a false aneurysm of the basilar artery (Fig. 5). The patient had an uneventful recovery and was discharged from the hospital to a brain rehabilitation center because of postanoxic encephalopathy.

Discussion

Aneurysms can be congenital or acquired. Acquired aneurysms can be degenerative, inflammatory, traumatic, iatrogenic, or infectious (mycotic). Post-traumatic aneurysms are false because they lack a true wall. Pulmonary aneurysms are rare and post-traumatic aneurysms are uncommon. A review of the literature showed only 12 cases published; three cases after blunt trauma (of which one was bilateral) and nine cases after penetrating injuries. Iatrogenic pulmonary pseudoaneurysms are more common; the inser-
tion of the Swan-Ganz catheter is complicated by a pseudoaneurysm in 0.2 per cent of the cases. It has also been reported after chest tube insertion. Two types of vascular lesions can develop after chest trauma: arteriovenous fistula and pseudoaneurysm. Both complications are quite unusual. Symbas et al. performed arteriography on 22 patients 72 hours after penetrating chest trauma and did not identify any vascular lesions. It has been suggested that the low pressure of the pulmonary system allows for satisfactory tamponade; in addition pulmonary hypertension is a major risk factor for pulmonary artery rupture and pseudoaneurysm formation during right heart catheterization. Other possible factors include small pressure differences between the pulmonary artery and venous systems and the high lethality of injuries to the great vessels.

Only 12 cases of post-traumatic aneurysm have been reported (Table 1). Fuller and Clark reported a case of an arteriovenous fistula associated with pseudoaneurysm after blunt trauma. The delay varies from few days to as long as 26 years. Hemoptysis is the most common presenting symptom. Massive hemoptysis secondary to rupture of a pseudoaneurysm is le-
that in more than 50 per cent of cases. Other symptoms include dyspnea, chest pain, and hypoxia. In some cases the patient is asymptomatic. Complications include: hemoptysis, thrombosis, infection, and distal embolization. The diagnosis may be delayed for many years. Invariably the chest radiograph will show a density. In a recently traumatized patient the differential diagnosis with pulmonary consolidation, contusion, or hematoma may be difficult. The persistence of opacity in the follow-up film of a trauma patient should raise the suspicion of a post-traumatic vascular complication. Although spontaneous resolution has been reported pseudoaneurysm of the pulmonary artery should not be left untreated. In some cases embolization can be done during angiography. Failure to thrombose the pseudoaneurysm will necessitate surgical intervention. Indeed all cases published have been treated surgically.

Summary

Although it is uncommon post-traumatic pulmonary pseudoaneurysm is a potential vascular complication after chest trauma. It should be included in the differential diagnosis of lung opacities especially if there is a history of previous chest injury. This condition should not be left untreated because of the high mortality rate associated with its rupture.

REFERENCES
