Gunshot wound of the main pulmonary artery: A case report

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Clinical pulmonary embolism resulting from a bullet entering the main pulmonary artery is rare. We describe a gunshot wound to the chest in an 18-year-old man that caused pulmonary embolism but no infarction.

CLINICAL SUMMARY

An 18-year-old man was brought to the emergency department immediately after being injured with a penetrating gunshot wound to his chest caused by a bullet from a pistol. The vital signs of the patient were unstable, he was unconscious, and urgent surgical intervention was required. Physical examination revealed only 1 entrance wound in the middle of the sternum, but there was no exit wound. Urgent computed tomographic (CT) analysis of the chest showed a fixed bullet on the cardiac mass, minimal pericardial hematoma, and left pneumothorax (Figure 1).

After a chest tube was inserted into the left thorax in the emergency department, he was immediately taken to the operating room.

Median sternotomy was performed, and the pericardium was opened. As the hematoma was promptly cleaned, a bullet hole (blood jetting) was observed on the anterior wall of the main pulmonary artery. Finger pressure was applied on the main pulmonary artery to control the bleeding, and the patient's hemodynamics became stable. The wound was repaired with propylene sutures. The bullet, which was fixed (immobile) on CT, could not be found. The aorta and the posterior side of the pulmonary artery were seen to be intact.

The left and right sides of the chest were examined by means of digital control in an attempt to find the fixed bullet. However, no mass that could be imagined to be a bullet was found by means of palpation either in the pulmonary trunk or in the left lung hilus. Fluoroscopic investigation was then used in the operating room. Interestingly, the bullet had migrated out of the mediastinum. The embolization of the bul-

FIGURE 1. Preoperative computed tomographic image.

let should have happened between the imaging and the exploration of the wound.

No further interventions were performed because the patient's condition could have deteriorated. Chest tubes were inserted, the left lung was repaired, and the sternotomy was closed. The patient left the operating room in stable hemodynamic condition. Although the patient woke up 14 hours later, the patient's postoperative course was uneventful. A

FIGURE 2. Postoperative computed tomographic image.

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Disclosures: None.

Received for publication May 21, 2008; revisions received July 17, 2008; accepted for publication July 26, 2008; available ahead of print Feb 5, 2009.

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J Thorac Cardiovasc Surg 2010;139:e17-8

0022-5223/\$36.00

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doi:10.1016/j.jtcvs.2008.07.037

control chest CT scan was taken on the second postoperative day (Figure 2). It was recognized that the bullet had migrated to the left posteroinferior pulmonary artery. Nevertheless, throughout the patient's hospital stay, no signs of pulmonary embolism or infection could be observed. Pulmonary and laboratory test results were almost normal (aspartate aminotransferase, 33 IU/L; alanine aminotransferase, 20 IU/L; lactate dehydrogenase, 247 IU/L) on the second day. He was discharged 8 days after the emergency operation.

DISCUSSION

Pulmonary embolism after a gunshot wound is a very rare occurrence.¹⁻⁵ Most patients with gunshot wounds to the pulmonary artery do not reach the hospital, making these cases even rarer and more interesting. The number and size of bullets at the impact site might make migration easier, as in our patient. Most cases resulting in pulmonary artery embolization are results of gunshot wounds to the peripheral veins, and there is not a concomitant cardiac injury.² We thought that the bullet might have escaped into the pulmonary artery because of our finger pressure acting like a bottle opener on a wine cork. Embolism can be vague or insignificantly symptomatic, as in our patient. Pulmonary artery bullet emboli might cause pulmonary infarction, arterial wall erosion, and hemorrhage.¹ In such cases emergency or second-look surgical intervention is indicated, as in cases with massive bleeding and stubborn blood loss, bronchial injury with massive air leak, esophageal injury, pericardial tamponade, diaphragmatic injury, great vessel injury, and acute deterioration of the patient.²

Indications of bullet extraction from the branch of the pulmonary artery was not defined in the literature clearly.¹⁻⁵ The location of the bullet is important in deciding the type of management. Some authors suggest conservative treatment for asymptomatic patients.² At the same time, the stress of a secondary urgent surgical intervention was avoided in our patient. After the operation, no sign of embolism or late infection was observed. Because of these reasons, bullet removal in a second intervention was not attempted.

Bullet extraction indications from the pulmonary artery should be clearly defined individually, according to the location and size of the bullet, in each firearms victim. In patients with no exit wound from the body, bullet embolism must be considered.

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References

1. Babatasi G, Massetti M, Bhoyroo S, Le Page O, Khayat A. Pulmonary artery bullet injury following thoracic gunshot wound. *Eur J Cardiothorac Surg*. 1999;15: 87-90.
2. Demirkilic U, Yilmaz AT, Tatar H, Ozturk OY. Bullet embolism to the pulmonary artery. *Interact Cardiovasc Thorac Surg*. 2004;3:356-8.
3. Stephenson LW, Workman RB, Aldrete JS, Karp RB. Bullet emboli to the pulmonary artery: a report of 2 patients and review of the literature. *Ann Thorac Surg*. 1976;21:333-6.
4. Kortbeek JB, Clark JA, Carraway RC. Conservative management of a pulmonary artery bullet embolism: case report and review of the literature. *J Trauma*. 1992;33: 906-8.
5. Patel KR, Cortes LE, Semel L, Sharma PV, Clauss RH. Bullet embolism. *J Cardiovasc Surg (Torino)*. 1989;30:584-90.

Mitral-aortic intervalvular fibrosa pseudoaneurysm resulting in the displacement of the left main coronary artery after aortic valve replacement

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Mitral-aortic intervalvular fibrosa (MAIVF) pseudoaneurysms are usually secondary to infection and common in patients with aortic valve replacement for infective endocarditis.¹ Because MAIVF pseudoaneurysms may lead to potentially perilous outcomes, such as rupture to the adjacent cardiac chamber or pericardium, alteration of the 3-dimensional structure of the mitral valve, or disturbance of coronary artery blood flow, the early detection of these pseudoaneurysms using periodic echocardiography or radiologic imaging is important. We describe a case of a MAIVF pseudoaneurysm 6 months after aortic valve replacement that resulted in displacement and compression of the left main coronary artery, causing symptoms of angina.

CLINICAL SUMMARY

A 35-year-old man was admitted with severe chest pain that developed abruptly while taking a shower. He had

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Disclosures: None.

Received for publication July 12, 2008; accepted for publication July 31, 2008; available ahead of print May 18, 2009.

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J Thorac Cardiovasc Surg 2010;139:e18-20

0022-5223/\$36.00

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doi:10.1016/j.jtcvs.2008.07.045