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Delayed cardiac tamponade caused by a staple line after wedge resection of the lung

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Abstract

An 80-year-old woman was diagnosed with an adenocarcinoma of the left lower lobe, clinical stage IA3. Taking the patient's age and medical history into consideration, a wedge resection was performed. After the resumption of rivaroxaban on postoperative Day 3, the patient suddenly developed cardiac tamponade on postoperative Day 5. A drainage tube was placed by pericardiocentesis, and the haemodynamics recovered immediately. No recurrence of cardiac tamponade was observed. The confluence of staple lines is a risk factor for tissue damage. Some covering is recommended, especially when the stapling line contacts the pericardium on the left side.

Keywords: Cardiac tamponade • Pericardial bleeding • Rivaroxaban • Lung resection

INTRODUCTION

In recent years, postoperative complications have been reduced by evidence-based management, but complications associated with surgical treatment are sometimes unavoidable.

Here, we report a case of delayed cardiac tamponade after wedge resection of the lung. Since there are few studies on postoperative complications, this report aimed to further the improvement of safety practices in such cases.

CASE PRESENTATION

An 80-year-old Asian woman was referred to our department because of a pulmonary nodule in the left lower lobe (Fig. 1). She had a history of paroxysmal atrial fibrillation and was taking rivaroxaban. Her body mass index was 27.3. She had no history of cigarette or alcohol consumptions.

Bronchoscopy was performed and pathological findings revealed adenocarcinoma of the left lower lobe, clinical stage IA3. Lobectomy and lymph node dissection was desirable as a standard treatment but taking the patient's age into consideration, she was unwilling to take risks. Therefore, we chose a wedge resection in order to be as minimally invasive as possible.

A thoracoscopic wedge resection of the left lower lobe was performed. Rivaroxaban was discontinued during the perioperative period and was replaced with subcutaneous heparin. The chest drain was removed on postoperative Day (POD) 2, and oral administration of rivaroxaban was resumed on POD3.

At 9 PM on POD5, she complained of sudden dizziness after walking back from the bathroom. Vital signs showed decreased

blood pressure and bradycardia (BP66/41 mmHg, PR41/min sinus). Contrast-enhanced computed tomography showed pericardial fluid retention and there was a slight leakage of contrast medium (Fig. 2A). This was judged to be a symptom of cardiac tamponade due to acute intra-pericardial bleeding. Two hours after the diagnosis, a drainage tube was placed by pericardiocentesis, and the



Figure 1: Chest computed tomography image showing a 21-mm nodule in the left lower lobe.

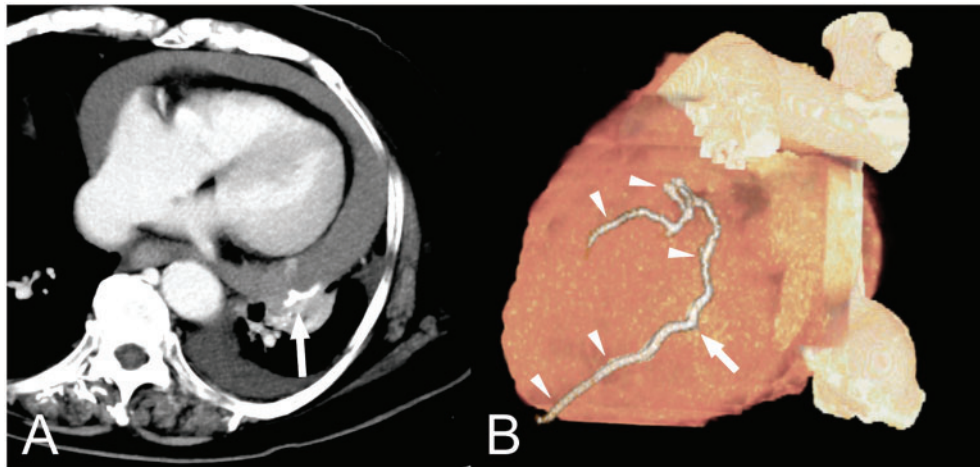


Figure 2: (A) Contrast-enhanced chest computed tomography image showing cardiac tamponade with the stapling line (white arrow). There is a slight leakage of contrast medium into the pericardium near the protruding region of the stapling line. (B) The reconstructed image of the stapling line (white arrowheads) and the heart with pericardial haemorrhage. The protruding region that was suspected of injuring the heart is indicated by a white arrow.

haemodynamics recovered immediately. After 30 min, 410 ml of bloody drainage was obtained. Since there was little increase in drainage after that, a repeat operation was not performed. The bleeding was monitored intensively and rivaroxaban was discontinued. The drainage gradually decreased; therefore, the pericardial drain was removed on POD7. Since the patient's hypoxaemia during sleep was prolonged due to obesity, she was discharged on POD18 with home oxygen therapy. No recurrences of pericardial bleeding were observed.

The final pathological diagnosis was papillary adenocarcinoma of the lung. Rivaroxaban was discontinued. Fourteen months after the operation, no recurrence of the lung cancer or thrombotic complications was observed.

DISCUSSION

Currently, there are few lung resections performed without endostaplers. According to a report examining staple-related adverse events, postoperative staple-related bleeding was recorded as 0.04% [1]. There are several reports of cardiac tamponade that occurred after lobectomy, but these were caused by major pulmonary vascular treatment [2]. Our patient underwent a wedge resection and bleeding was caused by a pulmonary stapling line (Fig. 2B). To the best of our knowledge, this complication has not been previously described in the literature.

In our case, the pericardium was in contact with the pulmonary stapling line. Therefore, we suspected that the repeated scraping stimulation caused by heartbeat should affect to bleeding. Since there are some reports of postoperative bleeding due to staple malformations, we carefully checked the staple line and tried to remove malformed staples that may cause damage to other organs. However, as previously reported [3], the confluence of the lines tends to protrude, and lung expansion is likely to occur with partial resection alone. Therefore, tissue damage due to contact should have been considered. Since the heart, particularly the left ventricle, moves dynamically, some covering may be considered, especially when the stapling line contacts the pericardium. We would use pericardial fat or TachoSil in the same situation because of its thickness. But the most important thing is to make a staple line that not protruded.

Oral administration of rivaroxaban was considered to have a significant influence on the course. There have been reports of spontaneous pericardial bleeding due to rivaroxaban, and it was said that interactions with CYP3A4 via inhibitors leading to increased haemorrhagic risk [4]. Our case was in polypharmacy and the other CYP3A4 inhibitors were administered, therefore, it can be said that she was in a high risk of bleeding. In such cases, more attention should be paid to the staple lines.

CONCLUSION

We reported a case of postoperative delayed cardiac tamponade due to a pulmonary stapling line. Although it may be difficult to prevent such complications completely, it is important to understand that the confluence of staple lines is a risk factor for tissue damage. Based on past published reports, some covering is recommended, especially when the stapling line contacts the pericardium on the left side.

Conflict of interest: none declared.

Reviewer information

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