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Commentary: Is there preventive measure for postoperative bleeding caused by the erosion of the bronchial staple-line in the chest wall?

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Takamori and colleagues¹ report a case of delayed hemothorax following the use of a bronchial staple and concluded that attention must be paid to the projection of the staple during surgery. With the development of thoracoscopic technology, the use of staples in thoracic surgery has become more extensive. It has been proven that it is safe and feasible to use the endostapler in video-assisted thoracoscopic surgery. However, staple-related complications have been occasionally reported, the most common of which is continuous air leakage after the operation. Qiu and colleagues² conducted a multicenter study and found that postoperative air leak occurred in 5.3% of patients who had lobectomy procedures performed with a stapler. In addition, there are also some cases of staple-related bleeding. Motoyama and colleagues³ reported a massive hemorrhage caused by a right inferior pulmonary vein stump staple. The bleeding point was an intercostal artery, which faced a stump divided by a stapler. There is little in the literature about delayed massive hemothorax associated with the bronchial stump staple. Therefore, there is a certain value to report a case about this.

Although the incidence of hemothorax is very low, it is a fatal complication. Prevention of bleeding is the key. As we

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CENTRAL MESSAGE

Detecting the risk from bronchial stump nails is the key to avoiding postoperative bleeding. Surgeons can avoid direct contact between stumps and the chest wall with a barrier of suitable materials.

know, the shape of the staple line usually looks like the letter B, but sometimes the shape of the staple line cannot close, which is C-shaped and easy to break an intercostal artery or other blood vessels. We must remove such a staple line through energy platform tools (ultrasonic shears, electric knife, etc) or scissors to eliminate hidden dangers. In the study of Takamori and colleagues, the stump of bronchus or vein, which would be forced posteriorly by the re-expanding remaining lobes, is close to the thoracic vertebra after the right lower lobectomy. With respiratory movement, the stump might rub against the thoracic vertebra, leading to rupture and bleeding of the intercostal artery. Negishi and colleagues⁴ reported a life-threatening hemothorax that occurred 40 days after surgery. The bleeding was from the intercostal artery, whose point was in the vicinity of the staple line dividing the intersegmental plane. This case revealed that scratching by staples can cause hemothorax through incidental injury of the intercostal artery. Qu and colleagues⁵ analyzed approximately 5000 patients who underwent lobectomies for various thoracic diseases. Four patients among them required re-exploration for progressive postoperative chest wall bleeding caused by bronchial stump nails.

However, protection of bronchial staple stumps wasn't mentioned in the study of Takamori and colleagues. Based on our clinical evidence, we noted that the main site of bleeding was the pleura corresponding to the bronchial

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stumps during the reoperation. In some cases, the nails on the staple that may have caused the bleeding were removed after resection. Then, materials such as biological hemostasis materials, pericardial fat, and rib muscles, etc. were applied to separate the bronchial stumps and corresponding pleura. Performing surgery cautiously and detecting the risk from bronchial stump nails are keys to preventing postoperative bleeding. Through the barrier of these materials, the surgeon can avoid direct contact between stumps and the chest wall.

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