Abstract #P018

Endobronchial removal of the peripherally located foreign body with the ultrathin bronchoscopy and ultrathin cryoprobe guided by a manual navigating method

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Background: Bronchoscope is a preferential method used to diagnose and remove airway foreign bodies, while for peripherally located foreign bodies, how to locate and remove them remains an intractable problem.

Case presentation: A 57-year old male presented with 2-week history of intermittent hemoptysis. Chest CT upon admission revealed a high-density opacity incarcerated in the distal basal segment of the left lower lobe, along with obstructive pneumonia (Fig. 1). Before the bronchoscopy, we used a manual navigating method to locate the lesion. Firstly, we read his thin-section CT images and a three-dimensional CT image reconstruction to identify which bronchial branch the lesion was located by. Then, flipped axial CT images around the vertical axis to match the reverse bronchoscopic view (Figure 2A), rolled CT images continuously and recorded every bifurcation point with a bronchial opening sketch from the second generation bronchus to the leading bronchus which the lesion was located by (Figure 2B). Thus, a simulated image of endoscopic image was made. The lesion was in LB10ciiβ according to our simulated image. The patient received general anesthesia

with laryngeal mask airway. We used ultrathin bronchoscope (UTB, BF-XP260, Olympus) with 2.8 mm outer diameter and 1.2 mm working channel. The endoscope approached according to the simulated image, and the foreign body was indeed found incarcerated in the lumen of LB10ciiβ, with obvious granulation tissue and purulent secretion (Figure 2C and 2D). Forceps was tried to clamp the foreign body, but the foreign body was too tender to be extracted in a whole piece. After several times of clamping, the foreign body was gradually extracted, and it turned out to be fragments of a tiny chili. We then examined the airway and found LB10c seeming clear under the bronchoscope. However, reexamined CT indicated that the residual foreign body was pushed further away (Figure 3A). Then the second bronchoscopy was performed under general anesthesia with tracheal intubation. UTB revealed the remaining chili was still incarcerated in the distal LB10ciiβ. We adopted an ultrathin cryoprobe with 1.1 mm outer diameter (ERBECRYO2, ERBE). As shown in Figure 3B, the cryoprobe was inserted into UTB, keeping the probe against the foreign body, and freezing for 4 s, and then it was removed with the UTB together out of the airway. The foreign body was frozen, and after twice freezing, the remaining chili was completely extracted (Figure 3C). Reexamined CT confirmed the completely removal of the foreign body (Figure 3D).

Conclusion: Combined use of manual navigating method, ultrathin bronchoscope and ultrathin cryoprobe, which can easily bend and extend to the distal bronchus, and harvest large specimens by the movement of freezing and pulling out the probe, could successfully extract foreign bodies lodged in the distal airways and avoid thoracic surgery.

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The authors declare that they have no competing interests.

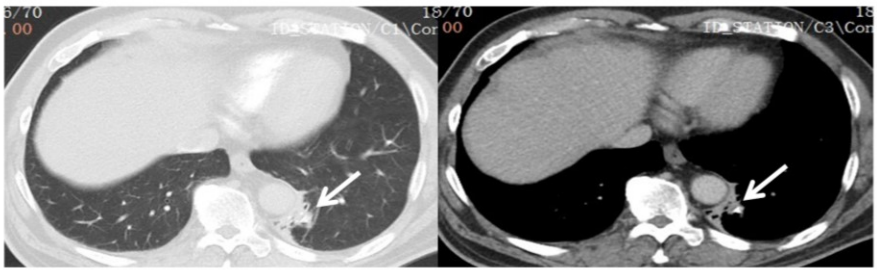

Figure 1: Chest CT upon admission revealed a high-density opacity incarcerated in the distal basal segment of left lower lobe (arrow), along with obstructive pneumonia.

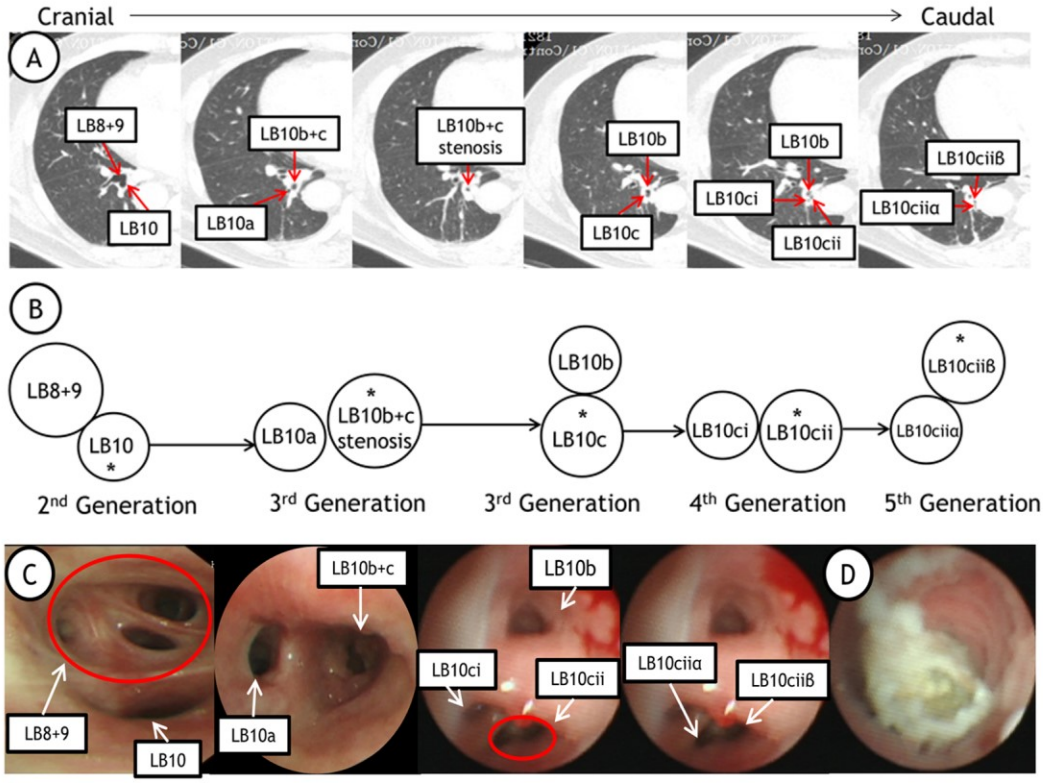

Figure 2: (A and B) Schematic drawing of left lower basal segment corresponding to CT images via manual navigating method. (A) Flipped axial CT images around the vertical axis to correlate with bronchoscope movement in a cranial-caudal direction. (B) Traced the bronchial branch in which the lesion was located, and recorded with a bronchial opening sketch at every bifurcation point. (C) Bronchoscopic images were consistent with simulated map. (D) The foreign body was located in LB10ciiβ, with obvious granulation tissue and purulent secretion.

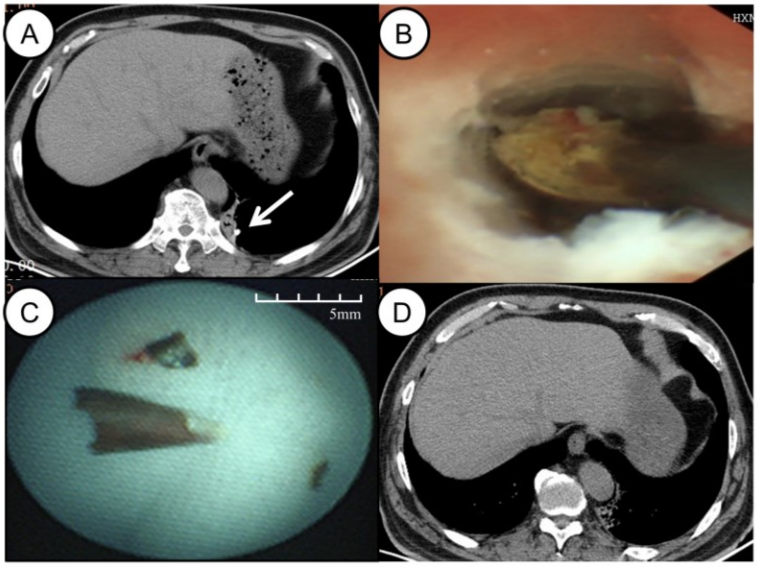

Figure 3: (A) Reexamined CT images indicated that the foreign body was pushed further away (arrow). (B) The cryoprobe was inserted into ultrathin bronchoscope (UTB), keeping the probe against the foreign body, and freezing. (C) The remaining chili was completely extracted. (D) Reexamined CT images confirmed the completely removal of the foreign body.