CASE REPORT

Medical thoracoscopic removal of a metal needle from the pleural space

Richa Gupta,¹ Prince James,¹ Balamugesh Thangakunam,²
Devasahayam Jesudas Christopher¹

¹Department of Pulmonary Medicine, Christian Medical College, Vellore, Tamil Nadu, India

²Pulmonary Department, Christian Medical College, Vellore, Tamil Nadu, India

Correspondence to

Dr Prince James,
drprincej@gmail.com

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SUMMARY

Medical thoracoscopy is an excellent diagnostic and therapeutic tool for management of pleural diseases. There have been case reports of removal of foreign bodies from pleural spaces with video-assisted thoracoscopic surgery under general anaesthesia by thoracic surgeons. We present a case of successful removal of an 8 cm long metal needle from the pleural space with single port medical semirigid thoracoscopy under local anaesthesia by a chest physician. Removal of a foreign body from the pleural space is one more indication for medical thoracoscopy, however, an experienced chest physician and proper case selection are very important for safety and a successful outcome of this procedure.

BACKGROUND

Thoracoscopy is being successfully used in the management of malignant pleural effusions, undiagnosed pleural effusions and pneumothorax. However there are very few case reports of thoracoscopic removal of a foreign body from the pleural space.^{1–7} In all of these published reports, video-assisted thoracoscopic surgery (VATS) under general anaesthesia has been used by thoracic surgeons. We report a case of removal of a metal needle from the pleural space with medical thoracoscopy (MT) under local anaesthesia by a chest physician in India.

CASE PRESENTATION

A 60-year-old man, non-smoker, presented with left side chest pain, fever and breathlessness of 1-month duration. He had type 2 diabetes mellitus and systemic hypertension for the past 15 years. Initially, he underwent a thoracentesis for left-sided pleural effusion at his local hospital; during this procedure, a pleural aspiration metal needle broke inside his chest wall leaving an 8 cm long piece that could not be retrieved (figure 1). Subsequently, he developed high-grade fever.

INVESTIGATIONS

A CT scan of the thorax showed a left-sided loculated pleural effusion with a metal needle piece inside the pleural space with one end embedded in the chest wall (figure 2). The treating physician informed the patient about this complication and for further management he was referred to our tertiary care hospital.

We performed a chest ultrasound, which showed a hypoechoic left side pleural effusion with a few

Figure 1 Metal needle piece in the left pleural space.

septations, and one end of the metal needle section still embedded in the patient's chest wall and the other end lying free in pleural fluid.

TREATMENT

We discussed the case in a multidisciplinary team meeting consisting of pulmonary physicians, radiologist and thoracic surgeon and it was decided to proceed with MT for removal of the needle from the pleural space as well as for management of the left side pleural effusion, while keeping the thoracic surgeon on standby during the procedure. We discussed this management plan with the patient and his relatives and obtained free informed consent from them. We proceeded with MT using a semirigid thoracoscope (Olympus LTF 160 videothoracoscope) under local anaesthesia and sedation with Midazolam. We used chest ultrasound to locate the pleural effusion as well as the piece of needle. We gave local anaesthesia at the posterior axillary line in the left sixth intercostal space and then at the upper margin of the lower rib; we made a 1 cm long nick in the skin with a surgical blade. Via the skin incision, we performed a blunt dissection in the chest wall with artery forceps and then placed a plastic trocar and canula across the chest wall into the pleural space. We removed the trocar and introduced the semirigid thoracoscope into the left pleural cavity through the canula. MT showed multiloculated empyema. All the adhesions were cleared

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Figure 2 CT of the thorax showing metal needle piece in the left pleural space and embedded in the chest wall.

with help of semirigid thoracoscopic flexible biopsy forceps and 400 mL empyema fluid was aspirated. Thoracoscopy showed the 8 cm long metal needle piece, which was bent at one end and embedded in the chest wall and adhesions. The piece of needle was gripped with thoracoscopy forceps and pulled into the pleural space. Still holding one end of the piece with forceps, we successfully removed it en bloc from the pleural space with the semirigid thoracoscope (figure 3). Post-thoracoscopy there was no bleeding or bronchopleural fistula. Thoracoscopic parietal pleura biopsy showed acute on chronic inflammation with no evidence of granuloma or malignancy. Pleural fluid culture as well as pleural biopsy tissue culture did not grow any organism. The patient was treated with a combination of amoxycillin and clavulanic acid for 6 weeks.

OUTCOME AND FOLLOW-UP

The patient's fever disappeared after thoracoscopy and the chest tube was removed on the third day. On follow-up after 1 month, the patient was asymptomatic with chest X-ray showing complete resolution of the left pleural effusion.

DISCUSSION

Thoracoscopy was introduced by Jacobaeus⁸ as a treatment for tuberculous (TB) pleuritis. However the use of thoracoscopy decreased with the advent of successful chemotherapy for tuberculosis in the mid-20th century. But by the end of the century, with technically advanced and better videoendoscopy instruments, thoracic surgeons started using VATS for pleuroparenchymal diseases. Gradually, pulmonary physicians also began performing MT with rigid or semirigid thoroscopes, with one or two entry points in the chest, under conscious sedation or local anaesthesia. MT is now being increasingly used for management of malignant pleural effusions, pleurodesis with talc poudrage, undiagnosed pleural effusions, TB pleural effusions, pneumothorax, empyema and haemothorax.

In the first published report of thoracoscopic removal of foreign bodies from the pleural space, Liu *et al*² reported two cases: one was of a metal fragment and the other a broken pin, both removed from the pleural space using thoracoscopy. In both of these cases the patients recovered completely, thereby avoiding thoracotomy and reducing the duration of hospital

stay. On reviewing the literature, there are very few case reports of thoracoscopic removal of foreign bodies from the pleural space.²⁻⁷ All of these were actually VATS performed by thoracic surgeons, under general anaesthesia. To our knowledge, until now there is only one case report of removal of a sewing needle from the left pleural space with a semirigid thoracoscope by Tie *et al*,¹ chest physicians from Malaysia. However Tie *et al* also used rigid thoracoscopy biopsy forceps by extending the incision of the thoracoscopy trocar port. Ours is probably the second case report of successful removal of a foreign body from the pleural space with semirigid thoracoscopy under local anaesthesia by a chest physician.

In comparison to thoracotomy and VATS, MT offers many advantages. MT can be performed by a pulmonary physician, under local anaesthesia and midazolam in the bronchoscopy/thoracoscopy suite. Therefore, in our opinion, MT circumvents the need for thoracotomy, VATS, general anaesthesia and single lung ventilation. In comparison to VATS or thoracotomy, MT can also reduce postprocedure intensive care unit and hospital stay, thus lowering the cost of treatment.

Before using MT as a therapeutic procedure for removal of foreign bodies from the pleural space, the following precautions should be taken.

1. CT of the thorax should be obtained to ascertain that the foreign body is not invading the mediastinum, vascular structures, heart or lungs, in which case VATS would be a better procedure, as it can control bleeding or air-leakage.
2. Prior to MT, chest ultrasound should be performed to locate the pleural effusion as well as position of the foreign body.
3. Prior to MT, the case should be discussed in a multidisciplinary team meeting of pulmonary physician, thoracic surgeon and radiologist to assess the most feasible procedure (MT/VATS/open thoracotomy) for removal of a foreign body from the pleural space.

Patient's perspective

A foreign body in the pleural space of the chest needs immediate removal. Until now, to remove a foreign body from the pleural space, thoracic surgeons made three holes in the chest of the patient to perform video-assisted thoracoscopy under general anaesthesia. In this case report, a piece of a metal needle within the pleural space was removed with help of medical thoracoscopy by making only one hole in the chest under local anaesthesia by a chest physician. Medical thoracoscopy does not require general anaesthesia and postprocedure intensive care unit stay, and thus reduces hospital stay as well as lowering the cost of treatment.

Figure 3 Retrieved metal needle piece (8 cm long).

Learning points

- ▶ Removal of a foreign body from the pleural space is one more indication for medical thoracoscopy.
 - ▶ However, right therapeutic procedure selection and an experienced chest physician in medical thoracoscopy are very important factors for safety and successful outcome of this procedure.¹
 - ▶ Medical thoracoscopy is an excellent tool in the hands of an experienced pulmonary physician for management of pleural diseases, as it reduces the need for thoracotomy or video-assisted thoracoscopic surgery and thus decreases the morbidity, hospital stay and cost of treatment.
4. The thoracic surgeon should always be on standby while attempting to remove a foreign body from the pleural space by MT.
 5. The procedure should be performed by an experienced thoracoscopist, as in such cases the foreign body has to first be located and then freed from the pleural space without injuring the lung or mediastinal structures.

Contributors PJ and RG performed the medical thoracoscopy procedure and wrote the manuscript. BT and DJC were part of the thoracoscopy team, wrote part of the manuscript and also edited it.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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