Novel treatment (new drug/intervention; established drug/procedure in new situation)

Teflon haemoptysis

Matthew Aboudara,¹ William Krinsky,² Daniel Harley³¹Pulmonary Service Department, Walter Reed National Military Medical Center – Bethesda, Bethesda, Maryland, USA;²Interventional Pulmonology Department, Franklin Square Hospital Center, Baltimore, Maryland, USA;³Thoracic Surgery Department, Franklin Square Hospital Center, Baltimore, Maryland, USA**Correspondence to** Dr Matthew Aboudara, maboudara23@gmail.com**Summary**

Teflon-coated pledgeted sutures can be used to reinforce the bronchial anastomosis site following a pulmonary resection in order to prevent bronchopleural fistula formation. The authors describe the case of a 42-year-old woman with recurrent haemoptysis secondary to the erosion of a pledgeted suture through the distal trachea. The pledgeted suture was used to reinforce a defect in the wall of the distal trachea after a right upper lobectomy for stage 2a squamous cell carcinoma. Surgically, a completion pneumonectomy with carinal reconstruction was thought necessary to treat the haemoptysis. Given her age and potential surgical morbidities, the decision was made to perform serial bronchoscopies with careful pruning and eventual removal of the pledget by using the cryoprobe and a flexible scissors. This resulted in the eventual removal of the suture. Follow-up bronchoscopy 4 weeks postremoval demonstrated no residual defect on the airway wall.

BACKGROUND

Our case highlights the successful use of a bronchoscopic technique to remove a Teflon coated pledgeted suture that was causing haemoptysis following a lung resection surgery. By using this technique, we were able to avoid a more morbid surgical intervention in an otherwise young and healthy patient.

CASE PRESENTATION

A 42-year-old woman with a history of stage 2a (T2bN0M0) squamous cell carcinoma of the lung was referred to our clinic with a complaint of recurrent haemoptysis. The patient had previously undergone a right upper lobectomy via a posterolateral thoractomy at another institution 18 months before the development of this complaint. During the operation, the right upper lobe bronchus was removed flush to the main bronchus. As such, the anastomosis was considered too friable to undergo a standard staple technique and so it was hand sewn and reinforced with Teflon coated pledgeted sutures to prevent bronchopleural fistula formation. She had a 72-pack-year smoking history and no family history of lung cancer. Otherwise, she had no other medical history to include diabetes mellitus, autoimmune or systemic inflammatory disorders.

A bronchoscopy was performed to identify the site of bleeding that showed extensive granulation tissue surrounding a white lattice like material that was consistent with a pledgeted suture migrating through the distal right tracheal wall.

In consultation with thoracic surgery, it was felt that a completion pneumonectomy with carinal reconstruction was thought to be necessary to ensure proper closure of the defect given the position of the eroding suture. However, given the potential morbidities of this type of procedure, the decision was made to proceed with serial bronchoscopies with careful pruning and eventual removal of the suture, while reserving surgery only if more local therapy failed. In addition, a review of the multi-planar CT images

with our thoracic radiologist demonstrated no concern for involvement of the surrounding pulmonary vasculature in the affected area.

INVESTIGATIONS

Two flexible bronchoscopies were performed in a similar manner with total intravenous anesthesia through a laryngeal mask airway with the intent of debriding the granulation tissue and removing the suture. They were performed 4 weeks apart with successful removal of the pledgeted suture during the second procedure. Granulation tissue surrounding the pledget was seen at the distal right

Figure 1 Pledget surrounded by granulation tissue, distal right trachea.

Figure 2 Pledget following complete extraction from the tracheal wall.

Figure 3 Pledgeted suture following removal from the airway.

trachea (figure 1) on both occasions. No active bleeding was noted but the friable granulation tissue oozed on contact with the bronchoscope. Biopsies of the granulation tissue demonstrated chronic inflammation with no evidence of malignancy.

TREATMENT

The granulation tissue was ablated and debrided with the cryoprobe and the pledget was trimmed away endoscopically with the flexible scissors permitting close approximation of the scissors to the bronchial wall. This allowed the

Figure 4 Residual crevice with bleeding controlled following removal of the pledget.

suture to be cut, (figure 2) and the entirety of the 1.5×1.5 cm pledgeted suture was then removed without difficulty (figure 3). The airway was then re-examined and demonstrated a defect of similar size and depth in the right lateral wall of the distal trachea (figure 4). Residual oozing was controlled with the application of topical thrombin.

OUTCOME AND FOLLOW-UP

Two weeks later, the patient reported cessation of her haemoptysis. Repeat bronchoscopy 4 weeks later showed a healing distal tracheal defect.

DISCUSSION

Cough with or without expectoration of blood or suture material resulting from suture migration and granulation tissue formation has been reported to occur in 4.4% of patients who undergo an anatomic surgical resection.¹ While the migrated sutures are typically easily removed, care must be used when confronted with more complex anastomosis techniques, as in our case. Teflon coated pledgeted sutures were introduced as a means of reinforcing the anastomosis and reducing the risk of bronchopleural fistula formation in patients at risk for such a complication. However, migration of these sutures into the airway can occur, leading to airway obstruction in addition to haemoptysis.²

Indiscriminate removal of foreign objects in such circumstances can result in a catastrophic outcome if a thoughtful evaluation is not performed. Massive bleeding from disruption of a major underlying thoracic vessel, bronchopleural fistula development, airway obstruction and recurrent infections from exposure of previously sterile spaces are all potential complications that can occur. As such, consultation with a thoracic surgeon and a radiologist experienced in thoracic imaging is prudent to help mitigate these potential consequences.

Finally, similar to other authors, we found the use of flexible endoscopic scissors to be helpful in releasing the pledgeted suture once the granulation tissue had been adequately debrided and the suture line exposed.³

Learning points

- ▶ Migrated sutures can cause cough and haemoptysis in 4.4% of patients who undergo anatomical lung resections.
- ▶ Flexible endoscopic scissors can be helpful in releasing a pledgeted suture once the suture line is exposed.
- ▶ A multi-disciplinary approach with thoracic surgery and a radiologist experienced in thoracic imaging is essential to plan for and minimise complications following removal of the suture.

Competing interests The views expressed in this article are those of the author and do not necessarily reflect the official policy or position of the Department of the Army nor the US Government.

Patient consent Obtained.

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Please cite this article as follows (you will need to access the article online to obtain the date of publication).

Aboudara M, Krinsky W, Harley D. Teflon haemoptysis. *BMJ Case Reports* 2012;10.1136/bcr.12.2011.5279, Published XXX

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