CASE REPORT

Bronchopleural fistula following laparoscopic liver resection

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SUMMARY

A rare case is presented of a 58-year-old woman who developed a bronchopleural fistula following a laparoscopic liver resection for a colorectal metastasis. The bronchopleural fistula was finally diagnosed when after repeated admissions for chest infections, the patient coughed up surgical clips. We propose a management plan based on our experience and hope this case report will add to the scarce reports of postoperative bronchopleural fistula cases in the literature.

BACKGROUND

Bronchopleural fistula (BPF) is an extremely rare phenomenon after liver surgery and is only usually seen after thoracic surgery. Our patient was initially treated for what was thought to be a persistent and difficult to treat chest infection and only after she presented having coughed up surgical clips did it alert clinicians to the possibility of a BPF. This case highlights the importance of considering this rare diagnosis in all patients presenting post-liver surgery with a persistent chest infection.

CASE PRESENTATION

A 58-year-old woman was referred to the hepatobiliary surgery department with a colorectal liver metastasis in segment 7 and underwent a non-complicated, laparoscopic liver resection of segments 5, 6 and 7. A month later she was admitted with fevers, rigors and right-sided chest pain. A CT of the chest showed a large, right-sided pleural effusion with a small subpleural collection around the liver for which a chest drain was sited and antibiotics started. She made a good recovery and was discharged 8 days later. A repeat CT of the chest 6 weeks later showed right-sided pleural thickening and the presence of a small asymptomatic sub-diaphragmatic collection ([figure 1](#)). She was managed by chest physicians with intermittent courses of antibiotics for a chronic exacerbating and unremitting chest infection for 2.5 years until she presented to A&E with vomiting, fever and exacerbation of her chronic cough under the care of a different liver surgeon. She was diagnosed and treated for a right-sided lower lobe pneumonia but despite multiple intravenous antibiotics she continued to spike fevers and have persistently raised inflammatory markers. Imaging revealed persistence of the subphrenic collection, for which she underwent percutaneous drainage under radiological guidance. During this admission, the patient coughed up surgical clips ([figure 2](#)) and the

Figure 1 Large capsular collection visible.

diagnosis of a trans-diaphragmatic collection leading to a BPF was made.

INVESTIGATIONS

CT scans and images of clips.

DIFFERENTIAL DIAGNOSIS

A possibility of bronchobiliary fistula, however, this was unlikely as discussed below.

TREATMENT

After a long course of oral antibiotics (linezolid and ciprofloxacin) the patient successfully underwent an open drainage of the subdiaphragmatic collection and was discharged home 6 days later.

OUTCOME AND FOLLOW-UP

The patient remains asymptomatic, her cough has improved and her recent imaging demonstrated complete resolution of the collection ([figure 3](#)).

DISCUSSION

A BPF is an abnormal communication between the pleural space and the bronchial tree. It is rare and can be notoriously difficult to manage, with an associated high morbidity and mortality rate. The earliest records for BPFs were those noted from thoracic combat wounds.¹ BPFs typically tend to occur after a pulmonary resection, with an incident rate of approximately 1.5–28%. This large variability is dependant on the aetiology, the surgical technique and is commoner in malignant disease.¹ BPFs are broadly classified into postoperative and non-postoperative causes and further subdivided based on aetiology such as malignancy, trauma (including iatrogenic) and infections. Our patient probably developed a subcapsular haematoma or

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Figure 2 Surgical clips coughed up by patient.

subphrenic collection, which then formed a communication with the bronchial tree likely because of an undiagnosed diaphragmatic injury at the time of the liver resection. One may argue that a laparoscopic technique increases the chance of a small diaphragmatic injury going unnoticed. However, laparoscopic resection of liver tumours has been shown to be safe, and equally as effective in terms of local resection and long-term survival as open resection.^{2 3} In a series of 15 patients, Boyd suggested that the fistula will only heal if the subphrenic collection is drained appropriately, however, he warned that the risk of it redeveloping is high. In each instance of his 15 cases, perforation had been in the far posterior portion in the right subphrenic space and into the posterior basal segments of the right lower lobe.⁴ CT is usually the best imaging modality as it allows characterisation of the type of BPF.⁵

Figure 3 Latest scan showing resolution of collection.

Bronchobiliary fistulas, however, are a different entity as the patient usually presents with biliptysis secondary to a high pressure system in the biliary tree. This is often (4–28%) after hepatic hydatid disease surgery and usually resolves with an ERCP.⁶ It is unlikely our patient developed a true bronchobiliary fistula as no bile was ever encountered and none of the imaging showed high-grade obstruction of the biliary tree. We present a rare and interesting case. We hope it will stimulate discussion as to the possible aetiologies and presentations of BPFs and remind surgeons and physicians alike to be mindful of this rare diagnosis in the postoperative surgical patient.

Patient's perspective

The patient was extremely grateful for our intervention; although she was symptomatic with this chronic infection for a long-time requiring multiple hospital admissions, she fully appreciated the rarity of her case and was actively involved in researching and reading the final manuscript prior to submission.

Learning points

- ▶ Although rare, a diagnosis of a trans-diaphragmatic collection causing a bronchopleural fistula should always be considered in any postoperative liver resection patient presenting with a chronic recurrent symptomatic pleural effusion.
- ▶ Drainage of the collection is essential and if radiological drainage is unsuccessful then open drainage is possible and can be successfully achieved with minimal morbidity.
- ▶ A multidisciplinary approach is essential and this should involve surgeons, radiologists, microbiologists and chest physicians.

Competing interests None.

Patient consent Obtained.

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