Surgery for tumour recurrence in a pneumonectomy space

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Abstract

Reoperative surgery through a previous pneumonectomy space focuses on the management of postpneumonectomy empyemas and bronchopleural fistulae. There are reports of elective tracheal resections done through the pneumonectomy space. We report two cases of successful excision of recurrent tumours (leiomyosarcoma and carcinoid) performed through the previous pneumonectomy space 2 and 13 years, respectively, after the primary surgical resection.

Keywords: Pneumonectomy; Recurrence; Carcinoid; Leiomyosarcoma

1. Introduction

Experience with regard to reoperative surgery through a previous pneumonectomy space is centred on the management of postpneumonectomy complications such as bronchopleural fistulae and empyemas. Literature with regard to elective surgery through a previous pneumonectomy space is limited to tracheal resections [1]. We report our experience of two cases that had successful resections of recurrent tumours in the pneumonectomy space. There are no previous reports of this in the literature, possibly because of the assumption that recurrence in the pneumonectomy space will invariably be associated with inoperable disease.

2. Case report: 1

A 52-year-old woman with a carcinoid tumour at the division of the left main bronchus underwent a left pneumonectomy via left posterolateral thoracotomy in 1993 for a typical carcinoid. The resection margins were clear of tumour. She remained symptom-free for 13 years before representing with severe flushing attacks. A repeat CT scan of the chest and abdomen revealed a mass measuring 2.7 cm near the aortopulmonary window (Fig. 1A) and a separate mass measuring 4.9 cm around the previously resected left bronchial stump (Fig. 1B). An octreotide scan confirmed carcinoid recurrence. A redo left thoracotomy via the previous pneumonectomy space was carried out through the bed of the resected fifth rib. The pneumonectomy space was reasonably clear with minimal pleural effusion. As expected, the heart was occupying the left chest surrounded by dense fibrinous adhesions. Tumour was found to lie between the aorta and the left atrium and was firmly attached to the bronchial stump. The tumour was excised with sharp dissection and reamputation of the left main bronchus. The bronchial stump was over sewn with 2-0 prolene and the chest cavity closed with a single drain, which was subsequently removed the following morning. The patient had an uneventful recovery and was discharged home on the seventh postoperative day. The final histology confirmed the mass to be a recurrent atypical carcinoid tumour with clear resection margins.

3. Case report: 2

A 44-year-old female underwent a left pneumonectomy via a left posterolateral thoracotomy for a primary leiomyosarcoma of the lung with clear resection margins. She was symptom-free for two years before a surveillance CT scan revealed a soft tissue mass in the left pleural cavity (Fig. 2A), with no signs of local invasion or evidence of distant spread. A redo left thoracotomy was performed through the previous pneumonectomy space and the chest cavity was entered after resection of the sixth rib. It revealed around 200 ml of clear effusion and some flimsy fibrinous adhesions. A pedunculated tumour mass was seen arising from the left dome of the diaphragm close to the oesophageal hiatus. The mass was excised enbloc with a rim of diaphragm (Fig. 2B). The diaphragmatic defect was closed primarily. The chest...
The cavity was closed without a drain. Recovery was uneventful and the patient was discharged home on the seventh postoperative day. The final histology confirmed the tumour to be a recurrent leiomyosarcoma with clear resection margins.

4. Discussion

Following surgical resection for lung cancer, patients have a 2–5% risk per year of developing recurrent carcinoma depending on the initial tumour stage [2]. After 70 years since the first successful pneumonectomy, it still remains an operation associated with significant morbidity and mortality [3,4]. Most reports in the literature with regard to intervention in the pneumonectomy space deal with postpneumonectomy complications like empyemas and bronchopleural fistulae, although elective tracheal resections have also been performed through the pneumonectomy space [1,5]. The postoperative changes in the pneumonectomy space and in the remaining lung have been well studied and described in the review by Kopec et al. [6]. Before considering reoperative

Fig. 1. CT scan of the chest showing (A) recurrent tumour near the aortopulmonary window and (B) recurrent tumour near the previously resected left bronchial stump.

Fig. 2. CT scan of the chest showing the recurrent tumour in the left chest (A) and macroscopic picture of the resected tumour (B).
surgery through the pneumonectomy space, it is important to
be aware of the shift in mediastinal structures and diaphragm
towards the operated side, and the physiological changes
that occur with regards to the residual lung function and
changes with exercise [6]. The access should be planned
carefully. We found that because of the associated rib
crowding, resecting one or more ribs afforded better access.
There are reports in the literature of fatal complications
following interventions through the pneumonectomy space
because of inability to appreciate the anatomical changes
that occur following a pneumonectomy [7]. Adhesions were
present in both cases, although they were denser in the case
of the recurrent carcinoid. This may reflect the longer time
interval between the primary resection and the recurrence.

Although there are reports of successful resection on the
remaining lung following a previous pneumonectomy, there
are no reports of surgery for recurrence in the pneumo-
nectomy space [8]. The question as to whether preoperative
histology is required would depend on the accessibility of the
lesion for biopsy via bronchoscopy or percutaneous guided
biopsy, whilst avoiding the potential risk of seeding tumour
cells in the needle tract (as might be anticipated in the
second case of recurrent leiomyosarcoma). PET scanning or
imaging modalities, such as an octreotide scan in the case of
carcinoid tumours, may obviate the need for preoperative
histology in certain cases.

This is the first report of successful excision of recurrent
tumours through a previous pneumonectomy space. Con-
ventionally, surgery through a pneumonectomy space was
considered to be high risk. However with modern thoracic
surgical techniques and postoperative care we conclude
that resection through the pneumonectomy space can be
performed safely in patients who are otherwise fit, with
preserved respiratory function and no evidence of metastatic
disease, and should be considered as the treatment of
choice. In our cases, the histology was carcinoid in the first
case, and leiomyosarcoma in the second. If the aforemen-
tioned criteria were met, and the recurrence was technically
operable, we would also consider surgery as first line
treatment for patients with local recurrence of a primary
non-small cell lung cancer.

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