Journal of Pediatric Surgery (2013) **48**, 445–448

ELSEVIER

Journal of Pediatric Surgery

www.elsevier.com/locate/jpedsurg

Cervical approach to the thoracic inlet in paediatric patients with broncho-pulmonary foregut malformations

Stephen Bennett, Edward Hannon*, Bruce Okoye

Department of Paediatric Surgery, St George's Hospital, SW17 0QT Tooting, London

Received 12 July 2012; revised 26 September 2012; accepted 5 November 2012

Key words:
Bronchogenic cyst;
Oesophageal duplication;
Thoracic inlet;
Approach;
Trap door

Abstract Lesions of the thoracic inlet present a significant challenge to the surgeon due to the difficulty of access and proximity to important neurovascular structures within the region.

We describe two cases of benign disease of the thoracic inlet in children, one bronchogenic cyst and an esophageal duplication, and report the cervical approach used to manage them. Both lesions extended from the neck through the thoracic inlet, but demonstrate how benign lesions in this area can be delivered up into a cervical incision, negating the need for the more invasive modified thoracotomies. A cervical approach can be safely and successfully used to approach benign pathology, such as bronchogenic cysts and oesophageal duplications of the thoracic inlet. Careful multidisciplinary planning is required for such procedures.

Lesions situated at the thoracic inlet present a significant challenge in terms of operative approach. This is due to the restricted nature of the thoracic cage at this level, alongside the difficulty presented by the crowded content of major vessels, nerves and other important structures. Determining which surgical approach to the thoracic inlet yields the best exposure for individual lesions, whilst minimising operative morbidity, is key to successful outcomes.

We describe two cases of broncho-pulmonary foregut malformations that extended from the neck via the thoracic inlet to the superior mediastinum. We discuss the cervical approach used to access these lesions and review the risks and benefits of other approaches in the literature.

* Corresponding author. Tel.: +44 02086721255; fax: +44 02086727110.
E-mail address: edhannon1@yahoo.co.uk (E. Hannon).

0022-3468/$ – see front matter © 2013 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.jpedsurg.2012.11.052

1. Case reports

1.1. Case 1

A previously well 1 month old term baby boy presented to the local emergency department with increasing respiratory distress and stridor. Chest radiograph demonstrated tracheal deviation to the left and due to the concern over upper airway obstruction he was intubated for transfer to a pediatric intensive care unit at our tertiary institution.

Otolaryngology consultation was sought and microlaryngoscopy and bronchoscopy demonstrated extrinsic compression deviating the trachea to the left. A small mass was also palpable in the right supra-clavicular fossa. Contrast computerized chest tomography (CT) scan showed a large fluid-filled cyst, closely adherent to the esophagus and trachea, deviating these structures to the left, and extending down into the superior mediastinum to the level of the right main stem bronchus (Fig. 1).

1.2. Case 2

A previously well 6 year old girl presented initially to the ENT surgeons with a week long history of fever and a new right supra-clavicular mass. An initial diagnosis of an infected branchial remnant cyst was made and she was treated with antibiotics and planned for elective imaging.

However, within 3 days the patient returned to the emergency department with ongoing fever, now associated with stridor and respiratory distress on activity. A chest radiograph showed deviation of the trachea to the left. Contrast CT scanning showed a large right-sided cystic lesion extending from the neck down through the thoracic inlet to the superior mediastinum, displacing the trachea to the left alongside the carotid and internal jugular vessels (Fig. 2).

1.3. Surgical management

Both cases were carefully planned with a multi-disciplinary team approach and performed as joint procedures with a cardiothoracic surgeon. Transverse supra-clavicular incisions were used well above the clavicle to ensure the major vessels could be well controlled. The right carotid artery, internal jugular vein and vagus nerve were dissected out and controlled (Fig. 3). The lesions were then carefully mobilised and delivered up into the wound, freeing any attachments to the surrounding tissue (Fig. 4). In Case 1 the cyst was closely adhered to the trachea. There was, however, no connection to the airway. In Case 2 the cyst had a broad communication with the esophagus which required over-sewing following its removal.

1.4. Histology

The lesion in Case 1 was a thin walled mucus filled cyst, lined by respiratory-type ciliated epithelium consistent with a bronchogenic cyst.

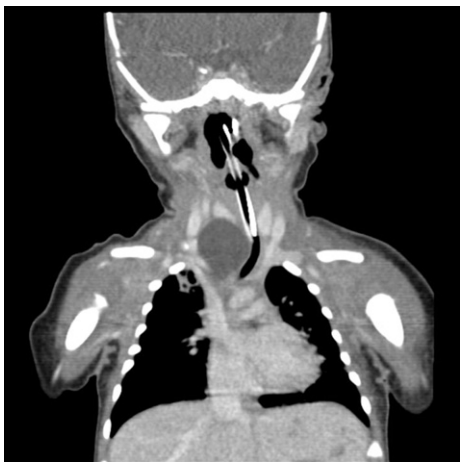

Fig. 1 Contrast CT scan of case 1 demonstrating a large cystic lesion in the right thoracic inlet, displacing the trachea to the left.

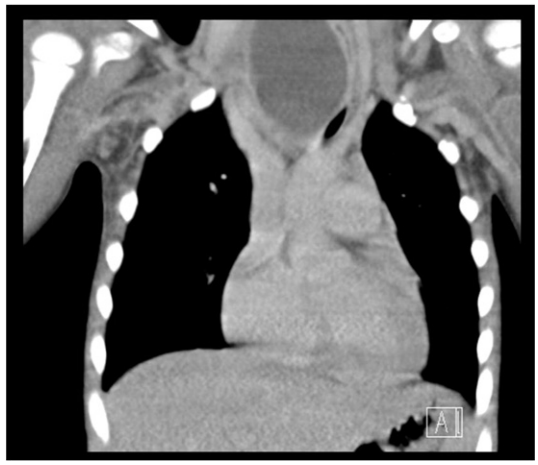

Fig. 2 Contrast CT scan of case 2 demonstrating a large cystic lesion in the right thoracic inlet, displacing the trachea to the left and splaying the great vessels in the superior mediastinum.

Case 2 had a larger collapsed cystic lesion, lined by stratified squamous and columnar epithelium with a thin layer of surrounding smooth muscle. The diagnosis was an esophageal duplication or diverticulum.

Both children recovered well and were discharged within 5 days of surgery. There was no morbidity associated with the procedures at 3 months follow up. These two cases demonstrate, benign lesions of the thoracic inlet in children may be approached via the neck avoiding the need for more morbid approaches to the region.

2. Discussion

A number of different surgical approaches to the thoracic inlet have been described in the literature. These have been developed primarily for use in the adult oncology setting where aggressive management is often required to obtain

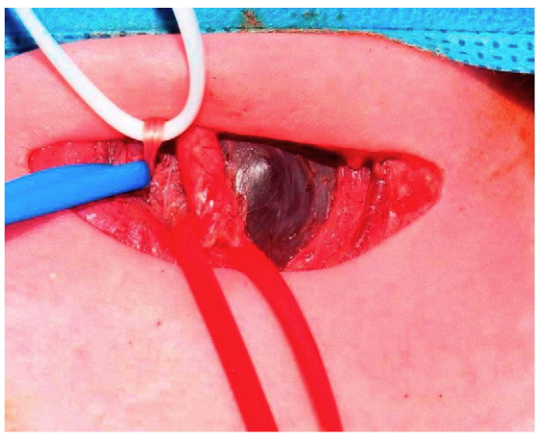

Fig. 3 Demonstration of isolation of the right common carotid artery (red), internal jugular vein (blue) and vagus nerve (white) in case 1, the cystic lesion can be seen medially.