ELSEVIER

European Journal of Cardio-thoracic Surgery 28 (2005) 180–181

EUROPEAN JOURNAL OF CARDIO-THORACIC SURGERY

www.elsevier.com/locate/ejcts

Case report

Postpneumonectomy esophageal compression: an unusual complication

Mustafa Yüksel[a,*], Bedrettin Yildizeli[a], Serdar Evman[a], Nihat Kodalli[b]

[a]Department of Thoracic Surgery, Marmara University Hospital, PK 97, 34718 Acıbadem, İstanbul, Turkey
[b]Department of Radiology, Marmara University Hospital, PK 97, 34718 Acıbadem, İstanbul, Turkey

Received 1 February 2005; received in revised form 10 March 2005; accepted 11 March 2005

Abstract

We report a case of postpneumonectomy esophageal compression with a complaint of dysphagia. In addition to the bronchial compression seen in postpneumonectomy syndrome, other anatomic structures, such as the esophagus, can also be affected by the extreme mediastinal shifting, and possibly be corrected by placement of prosthetic devices into the ipsilateral hemithorax, or with a stent placement.

Keywords: Postpneumonectomy; Esophagus; Compression; Late complication

1. Introduction

Postpneumonectomy syndrome is a rare and late complication of pneumonectomy that occurs as a consequence of excessive mediastinal shift into the evacuated cavity. Normally this dislocation results in a counterclock rotation of the heart and compression of the main bronchus or a lobe bronchus on the aorta or the spine, producing symptomatic proximal airway obstruction. As a different entity, we report an exceptional case of a 57-year-old patient in whom dysphagia due to esophagus compression had occurred 12 years following right pneumonectomy.

2. Case report

A 57-year-old man was admitted to our hospital with complaints of dysphagia, especially present against solid particles, and weight loss for 2 months.

His medical history revealed that he was undergone partial gastrectomy 24 years ago due to benign poliposis, and right pneumonectomy because of lung carcinoma 12 years ago. Adjuvant radiotherapy of 50 Gy was given after the operation, due to unknown reasons.

On admission, the chest X-ray revealed no specific pathology.

Computerized tomography (CT) of the thorax showed esophageal compression between inferior vena cava and descending aorta (Fig. 1). His gastroscopic examination showed an extraluminal compression between 34th and 43rd centimeters of the esophagus from the incisives, with no evidence of stenosis, reflux esophagitis, or axial deviation. To relieve the compression, a self-expanding metallic stent namely 'Ultraflex™' insertion was suggested. The patient refused the recommended therapy and was discharged. On follow-up, he still complains of dysphagia and refuses any kind of treatment modalities (Fig. 2).

3. Discussion

Anatomical and physiological changes, like counterclock rotation of great vessels and trachea, compression of the distal trachea and main bronchus by vascular structures and the vertebrae can occur as a late complication of right pneumonectomy [1–4]. These alterations are caused by hyperinflation of the remaining lung [1], the extreme mediastinal shift to the postpneumonectomy space (PPS), or the vacuum effect done by evacuated PPS [2,3]. This is called the postpneumonectomy syndrome.

In our case, such anatomical and physiological alterations following a right pneumonectomy caused esophageal compression, resulting in dysphagia. Although our patient had previous radiotherapy of 50 Gy, both thorax CT and gastroscopic examination have clearly demonstrated that there was an extrinsic compression of the esophagus, without any luminal pathology. It has been showed that esophageal motility disorders and dysphagia can occur due to the increases in the upper and the lower sphincter relaxing pressures, the abnormal peristalsis's of the mid and the distal esophagus, or the delayed gastric emptying. Mediastinal dislocation, local ischemia, direct injury to the esophageal wall, vagus nerve injury, or autonomous nerve plexus disturbances are among the known reasons [3,5].

In 1969, Kriedemann and Mataeev [5] reported 24 patients with esophageal compression by neighboring

* Corresponding author. Tel.: +90 216 325 91 33; fax: +90 216 325 24 26.
E-mail address: myuksel@marmara.edu.tr (M. Yüksel).

1010-7940/$ - see front matter © 2005 Published by Elsevier B.V.
doi:10.1016/j.ejcts.2005.03.015

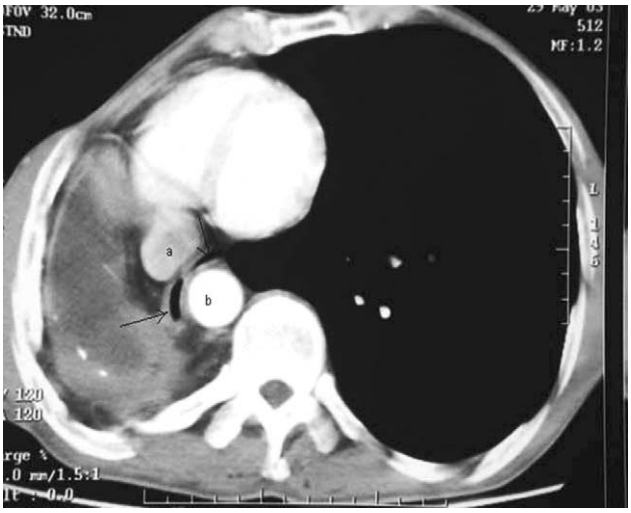

Fig. 1. Arrows showing esophageal compression between inferior vena cava (b) and descending aorta (a).

structures in a prospective study of 43 patients who had undergone pneumonectomy, with only two of them complaining of dysphagia. Since then, no study was reported.

Correction of postpneumonectomy syndrome required reexploration of the pneumonectomy space followed by anterior pericardiorrhaphy, phrenectomy and injection of sulfur hexafluoride or insertion of a prosthesis (saline solution or silastic implants) for the purpose of correcting the extreme shift of the mediastinum [2,4]. In our case, the esophagus, instead of the bronchus, was the effected structure and it may be speculated that these surgical methods would also be effective to relieve esophageal compression.

However, non-surgical palliative treatment methods for malign and benign intrinsic or extrinsic esophageal obstruction and strictures include dilation, laser vaporization and other thermal methods, alcohol injection, and stent insertion. None of these procedures are well-tolerated and long lasting methods [6]. Newer self-expanding metallic stents are primarily used to palliate symptoms of dysphagia in patients with inoperable esophageal cancer, and other indications include malign situations like anastomotic recurrence and secondary tumors within the mediastinum that compress the esophagus extrinsically. Many studies reported the usage of covered stents in treatment of tracheoesophageal fistulas and esophageal perforation with success rates of 80–100%, with low perforation risk and greater internal diameter of 20–25 cm, resulting in better relief of dysphagia [6–8]. Because our patient did not want a surgical approach, we selected to use a self-expanding metallic esophageal stent insertion due to the low complication rates, high success percentages and easy application. Since our patient refused the treatment, we could not observe the result of stent placement.

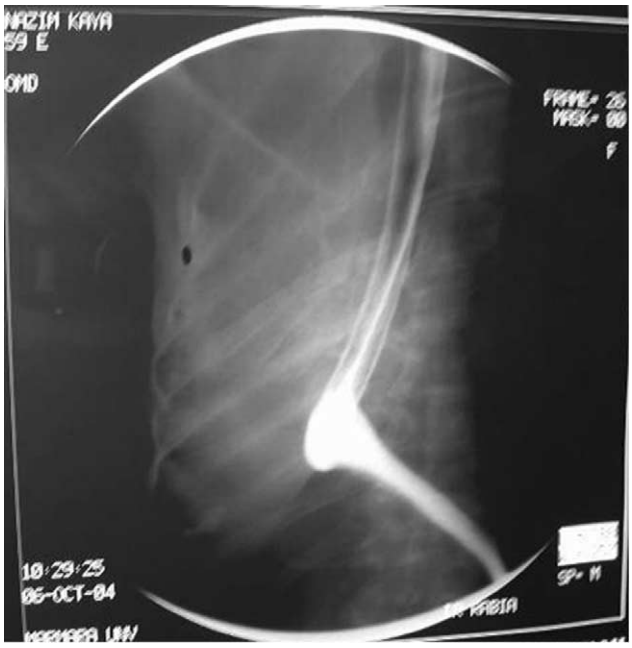

Fig. 2. Barium esophagography taken during follow-up, showing an extrinsic indentation due to left lateral compression.

4. Conclusion

Patients who have undergone pneumonectomy may present with dysphagia or upper gastrointestinal symptoms due to compression of the esophagus by neighboring structures. Our case underlies that the physiologic consequences of pneumonectomy, especially on the esophageal function, should be kept in mind.

References

[1] Fuentes PA. Pneumonectomy: historical perspective and prospective insight. Eur J Cardiothorac Surg 2003;23:439–45.
[2] Ponn RB. Complications of pulmonary resection. In: Shields TW, LoCicero III J, Ponn RB, Rusch VW, editors. General thoracic surgery. Philadelphia, PA: Lippincott Williams and Wilkins; 2005. p. 579–81.
[3] Kopec SE, Irwin RS, Umali-Torres CB, Balikian JP, Conlan AA. The postpneumonectomy state. Chest 1998;114:1158–84.
[4] Valji AM, Maziak DE, Shamji FM, Matzinger FR. Postpneumonectomy Syndrome. Chest 1998;114:1766–9.
[5] Kriedemann F, Mateev B. Morphologische und funktionelle Veranderungen an Osophagus ung magen bei pneumonektomierten patienten. Archiv fur Geschwulstforschung 1969;34:39.
[6] Grund KE, Storek D, Becker HD. Highly flexible self-expanding meshed metal stents for palliation of malignant esophagogastric obstruction. Endoscopy 1995;27:486–94.
[7] Watson A. Self-expanding metal oesophageal endoprostheses: which is best? Eur J Gastroenterol Hepatol 1998;10:363–5.
[8] Farivar AS, Vallières E, Kowdley KV, Wood DE, Mulligan MS. Airway obstruction complicating esophageal stent placement in two post-pneumonectomy patients. Ann Thorac Surg 2004;78:22–3.