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A case report



Ann. Ital. Chir.

Published online (EP) 29 January 2016

pii: S2239253X16024816

www.annitalchir.com

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A new perspective on the treatment of complicated giant emphysematous bulla. A case report

We report a case of 31 years-old female suffering from complicated giant bulla in the right upper pulmonary lobe. The patient was admitted to our hospital with a radiologic diagnosis of hydro – pneumothorax treated by chest tube in a first time, and later, for prolonged air leaks, by uniportal VATS with a single 4-cm skin incision. We have observed a giant ruptured bulla in right upper lobe, so we have performed bullectomy and mechanical pleurodesis. This case, in our knowledge, represents the first giant bulla resection performed by uniportal VATS.

KEY WORDS: Giant bulla, Giant bullous emphysema, Uniportal VATS

Introduction

Giant bullous emphysema (GBE) is a pathologic condition characterized by presence of large bulla or bullae, in greater part in the upper lobe. The dystrophic and bullous lung zone doesn't participate in gas exchanges and, therefore, this condition can cause dyspnea with hypoxia and chronic respiratory insufficiency or, in case of bulla's rupture, pneumothorax or acute respiratory failure.

GBE differs from bullous emphysema because in the first case, the bulla is surrounded by normal structural lung parenchyma. In the second case, we have bullae in a dystrophic parenchyma. GBE is sometimes referred to

Vanishing lung syndrome, described in the time by Burke and Roberts^{1,4}. This syndrome is characterized by presence of upper lobe giant bullae, occupying one-third of the hemithorax, often asymmetrical and unilateral that compresses surrounding normal lung parenchyma⁴. This condition has clearly been associated with smokers, alpha-1 antitrypsin deficiency or marijuana abuse.

We report the case of a patient with ruptured giant bulla, transferred to our hospital with a radiologic diagnosis of hydro-pneumothorax, treated by chest tube in a first time and later, for prolonged air leaks, by uniportal VATS.

Case Report

A 31 years-old female patient was admitted in a near hospital with right chest pain and progressive dyspnea. The clinical history of the patient was characterised by hypertension. Chest x-ray and CT scan revealed a right hydro – pneumothorax. So, she was treated, in a first time, by placement of a chest tube. The patient was transferred in our hospital where, considering prolonged air leaks and persistence of a residual pleural space, she underwent to uniportal VATS, on one lung ventilation,

Pervenuto in Redazione Settembre 2015. Accettato per la pubblicazione Dicembre 2015

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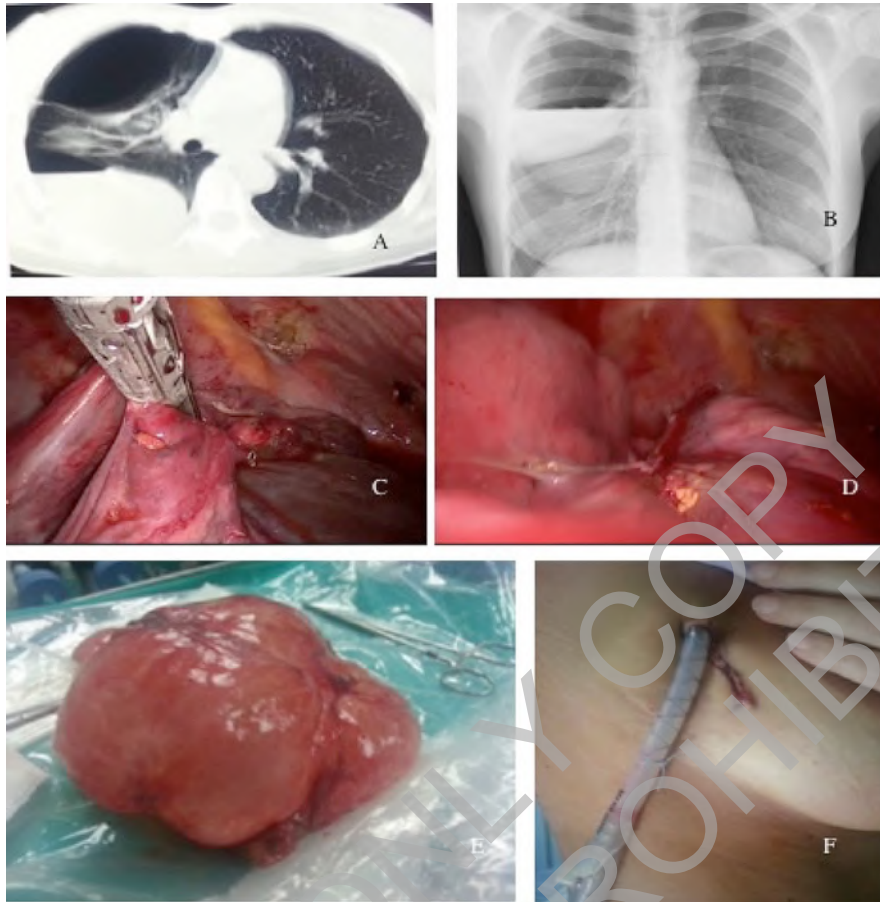


Fig. 1: A) and B): CT scan and chest X-ray image of preoperative hydro-pneumothorax. C): Resection of giant bulla by articulate endostapler. D) Remaining lung parenchyma after resection. E) Inflated giant bulla after surgical removing (15 x 7 cm). F) 4-cm incision for uniportal access with 28ch chest tube.

in left lateral decubitus. An anterior 4-cm incision in the 4th intercostal space was performed and a 10 mm-30° thoracoscope was introduced for exploring the pleural cavity. No rib-spreading was performed. During lung and pleural exploration, we observed a ruptured giant bulla in upper right lobe. The bulla was totally removed by use of an articulating stapler (Endo GIA™ Ultra, Covidien, USA) and easily extracted by an endobag. A mechanical pleurodesis was performed in order to avoid pneumothorax recidivism. A chest drain 28ch was inserted at the level of skin incision. The chest tube was removed in third day and the patient discharged home in fourth day without any complication. Macroscopically pathologic exam, showed a giant emphysematous bulla measuring 15 x 7 cm. (Fig. 1).

Discussion

In the GBE management, surgery is the gold standard treatment for specific groups of patients. Indeed, surgery

is suggested for large bullae occupying more than 30% of the hemithorax, with compression of adjacent healthy lung tissue and subsequent significant reduction in lung function and dyspnea. Surgery is also suggested when there are complications related to bullous disease such as infection or pneumothorax⁵. Several techniques have been described in the time, from “Brompton technique”, introduced by Monaldi (a non-excisional treatment with a percutaneous drainage of bulla with subsequent talcage) up to intra-cavitary bullous drainage or thoracoscopic bullous endoloop ligation. In the last decades, thoracotomy approach has been substituted by a 3-port conventional VATS approach and, actually, VATS bullectomy, performed by endostaplers, has universally been considered as gold standard procedure in the GBE management⁶. In the last years, it has been discussed the use of endobronchial unidirectional valves in order to treat highly selected COPD patients with giant bulla⁷. Actually, uniportal VATS is taking more and more importance to perform pulmonary wedge resections for peripheral pulmonary nodules, in the treatment of pri-

mary pneumothorax or for performing lung lobectomies or other more complex resections³.

In this report, we describe a giant emphysematous bulla's resection, performed by uniportal video assisted approach. In our knowledge, at the moment, there is not any report speaking about Uniportal approach in the surgical treatment of complicated giant bulla.

The benefits of uniportal approach include the one intercostal space involvement, without rib-spreading, the subsequent lower postoperative pain and the better aesthetic results in the patients³. In addition, VATS approach allows better access to the rear adhesions and emphysema, better access to disease of the lower lobe and absence of risk of infection of the sternum⁸. In our case, we have performed a 4-cm skin incision without rib – spreading, and we had the necessary space for introducing and mobilizing a 30° thoracoscope, one endostapler and one clamp ring in order to perform the giant bulla's resection without an invalidating disturbance by the instruments. We have observed no intra and postoperative complications and this aspect shows the feasibility and security of this resection in Uniportal VATS.

Riassunto

L'enfisema bolloso gigante, altresì detto polmone evanescente, è una sindrome clinica già descritta nel 1937 da Burke¹. Si tratta di una patologia idiopatica che colpisce i giovani, spesso fumatori; altri fattori di rischio sono rappresentati dal deficit di α -1 antitripsina e dall'abuso di marijuana². La severa distorsione dell'architettura del parenchima polmonare determina alterazioni della ventilazione e degli scambi gassosi. Le più frequenti complicanze sono rappresentate dallo pneumotorace spontaneo o provocato dalla ventilazione meccanica, e dalle infezioni. La "lung volume reduction surgery" (LVRS) è il trattamento gold standard in gruppi selezionati di pazienti. Le raccomandazioni alla chirurgia prevedono bolle occupanti > 30% dell'emitorace affetto o bolle complicate (rottura e/o sovrainfezione). Negli ultimi anni, la videotoracosopia ha dimostrato una maggiore efficacia in termini di ridotte complicanze peri e post-operatorie, riduzione del dolore, riduzione dei tempi di degenza e dei costi in confronto alla chirurgia "open"³.

Riportiamo un caso di una donna di 31 anni affetta da bolla gigante complicata del lobo superiore del polmone destro. La paziente, ricoverata per idro – pneumotorace, a causa di prolungate perdite aeree, nonostante drenaggio toracico veniva indirizzata a LVRS. Mediante VATS uniportale con singola incisione cutanea di 4 cm veniva individuata la rottura di bolla gigante del lobo superiore di destra e si eseguiva pertanto bullectomia e pleurodesi meccanica. Questo caso, nella nostra conoscenza, rappresenta la prima resezione di bolla gigante eseguita in VATS uniportale.

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