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Case Report / Приказ случаја

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Simultaneous bilateral spontaneous pneumothorax

Симултани билатерални спонтани пнеумоторакс

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Simultaneous bilateral spontaneous pneumothorax

Симултани билатерални спонтани пнеумоторакс

SUMMARY

Introduction Simultaneous bilateral spontaneous pneumothorax (SBSP) is a potentially life-threatening state that may imitate many lung diseases.

The aim of this report was to describe the presentation and highlights the potential difficulties in diagnosis and management of patients with SBSP.

Case outline A 23-year-old female was urgently assessed because of a progressive dyspnoea of 2-day's duration with associated bilateral chest pain. Lung auscultation revealed equally diminished breath sounds on both sides. During initial examination, there was the evidence of symptomatic deterioration with bilateral pleuritic chest pain, increased dyspnoea and agitation. She was found to have type II respiratory failure with the following biochemical parameters: pH=7.34, $PaCO_2$=6.3 kPa and PaO_2=7.9 kPa. The chest radiograph confirmed bilateral partial pneumothoraces of approximately 30%. Both left and right-sided thoracostomies with large -bore chest drain insertions were performed emergently, followed by partial resolutions of pneumothoraces. CT of the chest demonstrated residual pneumothoraces bilaterally with multiple apical bullae. In the further course, she subsequently underwent video-assisted thoracoscopic surgery with bilateral apicoectomies, bullectomies and pleural abrasion. Her chest drains were removed 3 days after surgery and a chest radiograph post-treatment demonstrated resolution of the pneumothoraces. She was discharged home without complications.

Conclusion Using clinical presentation, diagnostic algorithm and therapeutic management applied in the case of our patient, we emphasized a few mandatory steps in establishing the diagnosis of SBSP and further treatment.

Keywords: pneumothorax, classification, etiology, therapy; thoracic surgery; thoracoscopy, methods; chest tubes

САЖЕТАК

Увод Симултани билатерални спонтани пнеумоторакс (СБСП) је потенцијално животно угрожавајуће стање, које може имитирати бројна плућна обољења.

Циљ овог приказа је био да изнесе клиничку слику, тешкоће у дијагностиковању и лечењу болесника са СБСП-ом.

Приказ болесника Жена стара 23 године јавила се у хитну помоћ због прогресивне диспнеје и обостраног бола у грудном кошу, који трају два дана. Аускултацијом плућа утврђено је ослабљено дисање у пројекцији оба плућна врха. За време прегледа долази до интезивирања тегоба уз појаву агитираности. Анализом гасова артеријске крви утврђена је респираторна инсуфицијенција (тип 2) са параметрима: pH=7.34, $PaCO_2$=6.3 кРа и PaO_2=7.9 кРа. Хитном радиографијом плућа је визуализован обострани парцијални пнеумоторакс (око 30%). Учињена је хитна билатерална торакална дренажа са парцијалном резолуцијом пнеумоторакса обострано. КТ грудног коша указује на резидуални пнеумоторакс обострано са мултиплим апикалним булама. Потом је болесница подвргнута видео-асистираној торакоскопији са обостраном апикоектомијом, булектомијом и плеуралном абразијом. Дренови су одстрањени трећег постоперативног дана, а контролна радиографија је показала потпуну обострану резолуцију пнеумоторакса. Отпуштена је на кућно лечење без компликација.

Закључак За правовремену дијагнозу и успешно лечење болесника са СБСП битно је правовремено препознавање клиничке слике и поштовање дијагностичког и терапијског алгоритма.

Кључне речи: пнеумоторакс, класификација, етиологија, лечење; грудна хирургија; торакоскопија; грудни дрен

INTRODUCTION

Pneumothorax is the presence of air in the pleural space [1]. According to its aetiology, it can be classified as spontaneous, traumatic or iatrogenic [2]. Spontaneous pneumothoraces (SP) is categorised into primary and secondary [3]. Primary spontaneous pneumothorax (PSP) occurs in otherwise healthy individuals, whereas secondary spontaneous pneumothorax (SSP) is associated with underlying lung disease [2]. The incidence of SP is 9/100 000 people, and only 1.9% of spontaneous pneumothoraces are simultaneous bilateral SP (SBSP) [4, 5, 6]. SBSP is a potentially life-threatening state that may imitate many lung diseases. To make the accurate diagnosis, prompt chest radiography is essential [7]. The management of SBSP is acute and includes an urgent chest drain insertion, before definitive surgical intervention in order to reduce the risk of recurrence [6, 8].

The aim of this report was to describe the presentation and highlights the potential difficulties in diagnosis and management of an otherwise healthy patient with SBSP.

CASE REPORT

A 23-year-old female was urgently assessed because of a progressive dyspnoea of 2-day's duration with associated bilateral chest pain. She had neither cough nor fever. The previous medical history recorded no significant diseases. There was no data considering the recent air travel or trauma. She was a smoker with an approximate 4 pack-year history.

On initial assessment, the findings were generally within normal ranges: oxygen saturations of 96% on room air, cardiorespiratory compensated with a respiratory rate 15breaths/min, blood pressure of 125/80 mm Hg, heart rate 89 bpm and a temperature of 36.6°C. Lung auscultation revealed equally diminished breath sounds on both sides. During initial examination, there was the evidence of symptomatic deterioration with bilateral pleuritic chest pain, increased dyspnoea and agitation. She was found to have type II respiratory failure with the following biochemical parameters: pH 7.34, $PaCO_2$ 6.3 kPa and PaO_2 7.9 kPa. The chest radiograph confirmed bilateral partial pneumothoraces of approximately 30% (Figure 1).

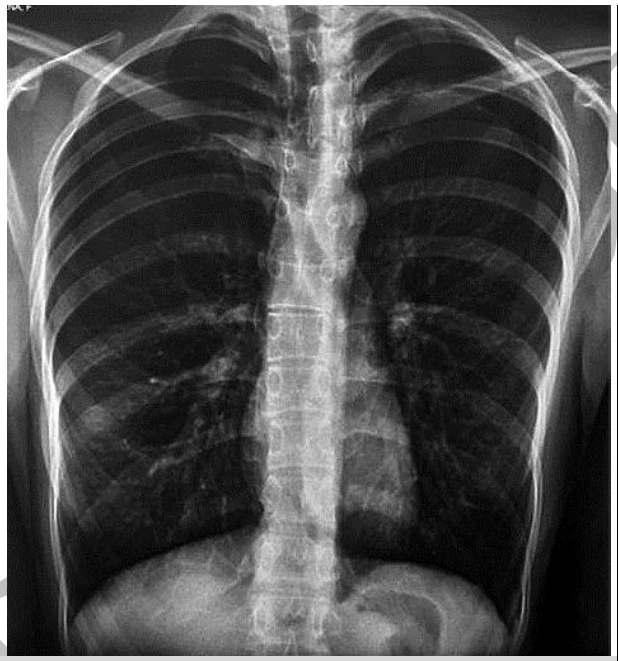

Figure 1. Chest radiograph on admission demonstrating bilateral pneumothoraces.

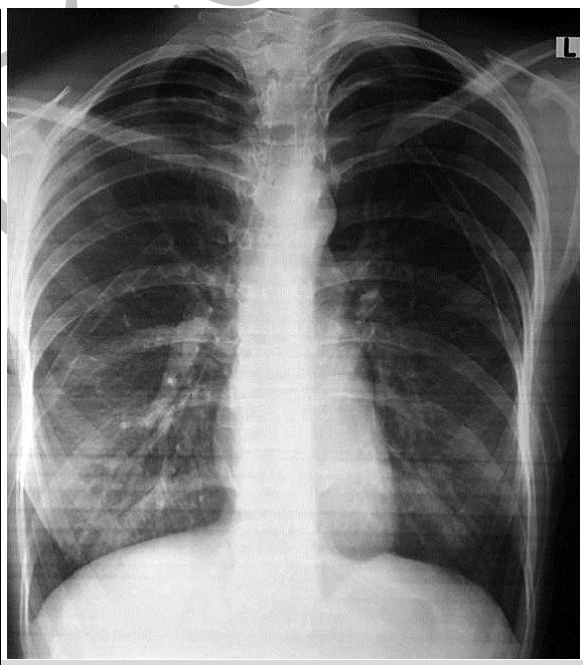

Figure 2. Chest radiograph post-treatment demonstrated partial resolution of the pneumothoraces.

Both left and right-sided thoracostomies with large -bore chest drain insertions were performed emergently, followed by partial resolution of (Figure 2). MSCT of the chest demonstrated residual pneumothoraces bilaterally with multiple apical bullae (Figure 3).

In the further course, she subsequently underwent video-assisted thoracoscopic surgery with bilateral apicoectomies, bullectomies and pleural abrasion. Her chest drains were removed 3 days after

surgery and a chest radiograph post-treatment demonstrated resolution of the pneumothoraces (Figure 4). She was discharged home without complications.

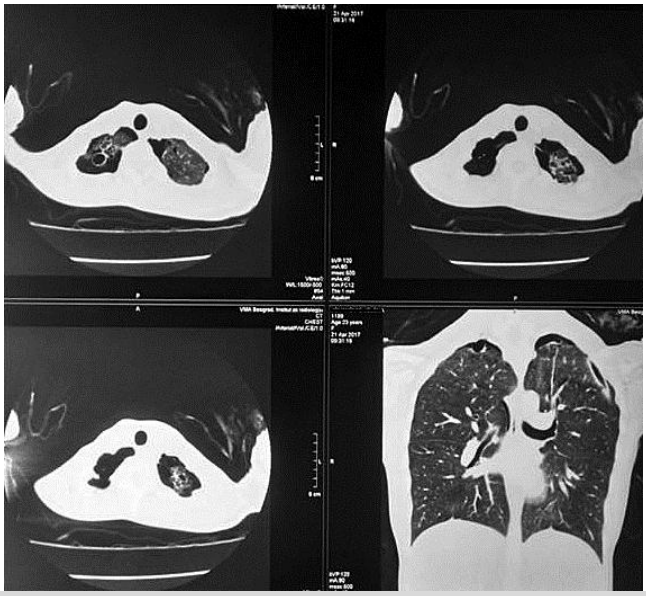

Figure 3. MSCT of the chest demonstrated residual pneumothoraces bilaterally with associated multiple apical bullas.

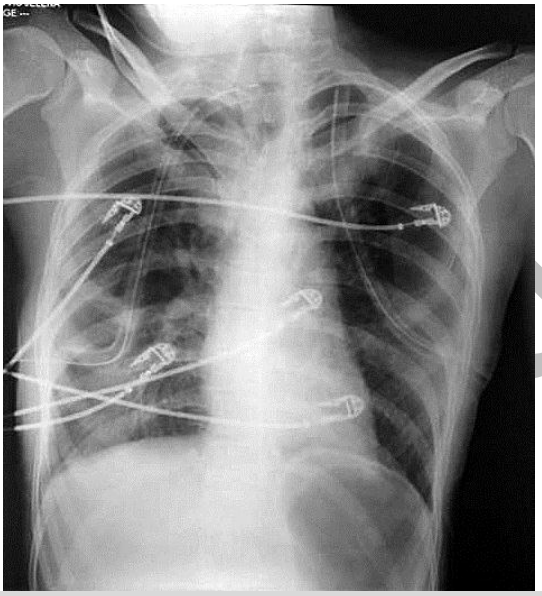

Figure 4. Chest radiograph post-treatment demonstrated complete resolution of the pneumothoraces.

In this case, the patient had a histologically confirmed evidence of fibrous walled bullae in the extirpated lung tissue. The clinical presentation, simultaneous bilateral occurrence and radiological findings, as well as histology reports confirmed diagnosis and it may therefore be classified as primary SBSP.

DISCUSSION

Primary spontaneous pneumothorax usually occurs in otherwise healthy males with characteristic constitution, tall and thin [2]. Although patients with PSP do not have associated lung disease, subpleural blebs and bullae are found to be the essential in the pathogenesis of PSP [2-3, 9]. SSP is often seen in patients with underlying lung disease, usually associated with affected cardiopulmonary reserve. That is the reason why SSP is more life threatening and difficult to manage compare to PSP [7, 10].

SBSP occurs extremely rare [4-6]. There are only few studies and case reports that were dealing with SBSP [6-8]. Some data suggest that only 56 patients with SBSP were described in the literature [11]. A twenty-year-long Swiss study recorded the incidence of SBSP of 4% among the patients with spontaneous pneumothorax [11].

In comparison to unilateral pneumothoraces, it is more likely linked with underlying lung pathology, including infectious and congenital diseases, proliferation of mesenchymal and epidermal cells, as well as COPD and anorexia nervosa. It is essential to do postoperative histopathological analysis of the excised tissue in order to rule out malignancy [2].

The common symptoms of SP are dyspnoea and pleuritic chest pain [10].The clinical presentations in SBSP range from absence of symptoms to tension pneumothorax and cardiorespiratory failure [6, 8, 11]. The characteristics such as acute onset, reduced breath sounds and decreased chest expansion and rapid cardiovascular compromise are most often seen [8]. The clinical symptoms and signs of SBSP may mimic common respiratory pathologies such as exacerbations of asthma or COPD [6, 8]. Our findings do not support previous knowledge that bullous lung disease was not associated with SBSP [11]. In order to avoid potential difficulties in diagnosing SBSP prompt chest radiography is indicated [7].

Immediate chest drain insertion is essential in the initial management of SBSP, and bilateral chest drainage has been recommended [10, 12]. Furthermore, early definitive surgical intervention is mandatory, in order to reduce the risk of recurrence [12]. After chest drain insertion, there is currently no gold standard treatment for SBSP [10, 12, 13]. In this case, the patient underwent bilateral VATS apicoectomy, bullectomy and pleural abrasion. Open thoracotomy and video-assisted thoracoscopic surgery (VATS) are two surgical options for definitive treatment and involve surgical pleurectomy, pleural abrasion, talc pleurodesis and bullectomy [12]. Some data suggested that VATS pleurectomy is comparable to open pleurectomy, but there is a slight increase in recurrence rate [14].

Using clinical presentation, diagnostic algorithm and therapeutic management applied in the case of our patient, we emphasized a few mandatory steps in establishing the diagnosis of SBSP and further treatment. The acute onset and respiratory symptoms progression required an urgent chest radiography that established the diagnosis of bilateral pneumothoraces.The treatment was started with bilateral intercostal chest drains. Subsequently, she was subjected to VATS bullectomy. Generally speaking, the long-term prognosis of our patient is going to be influenced by her pulmonary status but the short-term prognosis was certainly significant improved by the early surgical treatment.

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