DOI: https://doi.org/10.2298/SARH170504125K
UDC: 616.25-003.219

CASE REPORT / ПРИКАЗ БОЛЕСНИКА

Simultaneous bilateral spontaneous pneumothorax

Vanja Kostovski, Aleksandar Ristanović, Nebojša Marić, Nataša Vešović, Ljubinko Đenić
Military Medical Academy, Clinic for Thoracic Surgery, Belgrade, Serbia

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 highlight potential difficulties in diagnosis and management of patients with SBSP.
Case outline A 23-year-old female patient was urgently assessed because of a progressive two-day-long dyspnoea with associated bilateral chest pain. Lung auscultation revealed equally diminished breath sounds on both sides. During the initial examination, there was evidence of symptomatic deterioration with bilateral pleuritic chest pain, increased dyspnoea, and agitation. The patient 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. A 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, the patient subsequently underwent video-assisted thoracoscopic surgery with bilateral apicoectomies, bullectomies, and pleural abrasion. Her chest drains were removed three days after surgery and a post-treatment chest radiograph demonstrated resolution of the pneumothoraces. She was discharged 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

INTRODUCTION

Pneumothorax is the presence of air in the pleural space [1]. According to its etiology, it can be classified as spontaneous, traumatic, or iatrogenic [2]. Spontaneous pneumothorax (SP) is categorized 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 SP 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]. This case report describes the presentation and highlights potential difficulties in diagnosis and management of an otherwise healthy patient with SBSP.

CASE REPORT

A 23-year-old female patient was urgently assessed because of a progressive two-day-long dyspnoea with associated bilateral chest pain. She had neither cough nor fever. The previous medical history recorded no significant diseases. There was no data conserning recent air travel or trauma. She was a smoker with an approximate four 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 of 15 breaths/min., blood pressure of 125/80 mmHg, heart rate of 89 beats/min. 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. A chest radiograph confirmed bilateral partial pneumothoraces of approximately 30% (Figure 1).

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

In the further course, the patient subsequently underwent video-assisted thoracoscopic surgery (VATS) with bilateral apicoectomies,

Received • Примљено: May 4, 2017
Accepted • Прихваћено: May 30, 2017
Online first: June 6, 2017

Correspondence to:
Vanja KOSTOVSKI
Clinic for Thoracic Surgery
Military Medical Academy
11000 Belgrade
Serbia
kostovski.vanja@gmail.com

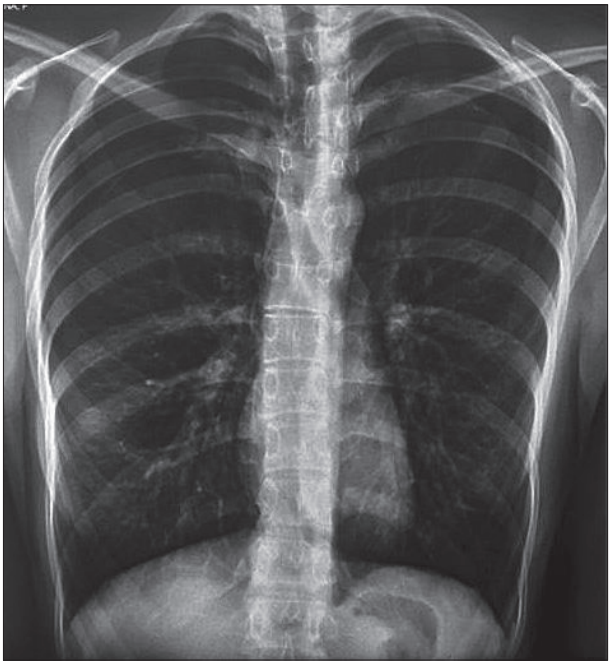

Figure 1. Chest radiograph on admission demonstrating bilateral pneumothoraces

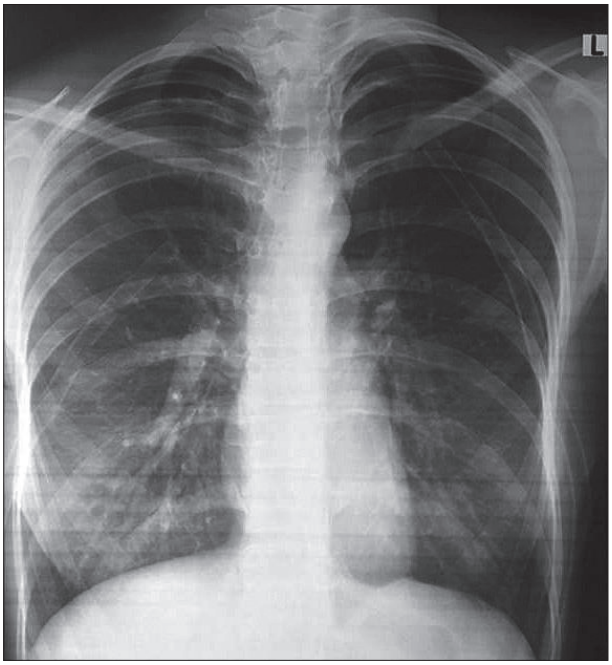

Figure 2. Post-treatment chest radiograph demonstrating partial resolution of the pneumothoraces

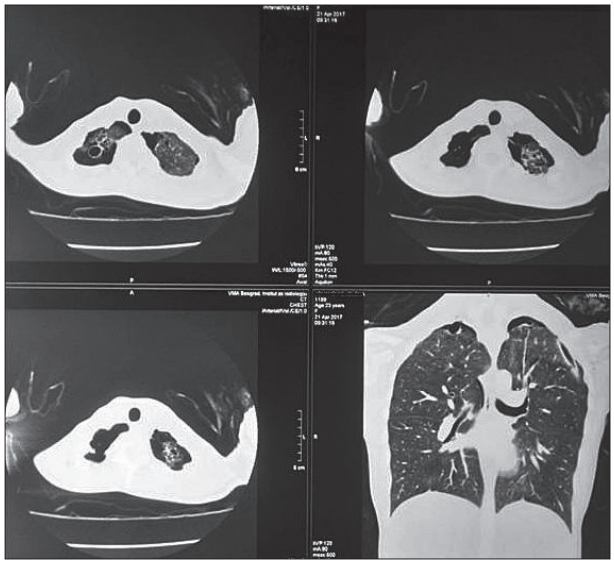

Figure 3. MSCT of the chest demonstrating residual pneumothoraces bilaterally with associated multiple apical bullae

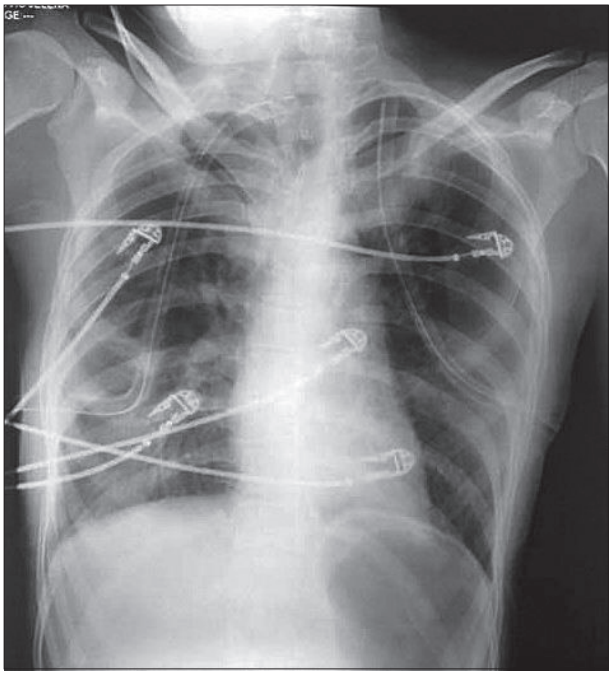

Figure 4. Post-treatment chest radiograph demonstrating complete resolution of the pneumothoraces

bullectomies, and pleural abrasion. Her chest drains were removed three days after the surgery and a post-treatment chest radiograph demonstrated resolution of the pneumothoraces (Figure 4). She was discharged without complications.

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 the diagnosis and it may therefore be classified as primary SBSP.

DISCUSSION

PSP usually occurs in otherwise healthy males of a characteristic constitution – tall and thin [2]. Although patients with PSP do not have associated lung disease, subpleural blebs and bullae are found to be 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. This is the reason why SSP is more life threatening and difficult to manage than PSP [7, 10].

SBSP occurs extremely rarely [4, 5, 6]. There are only several studies and case reports dealing with SBSP [6, 7. 8]. Some data suggest that only 56 patients with SBSP have been described in the literature [11]. A 20-year-long Swiss study recorded the incidence of SBSP of 4% among patients with SP [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 chronic obstructive pulmonary disease 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 the 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 seen most often [8]. The clinical symptoms and signs of SBSP may mimic common respiratory pathologies such as exacerbations of asthma or chronic obstructive pulmonary disease [6, 8]. Our findings do not support the previous position that bullous lung disease is 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 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 the clinical presentation, diagnostic algorithm, and therapeutic management applied in the case of our patient, we emphasized several mandatory steps in establishing the diagnosis of SBSP and further treatment. The acute onset and respiratory symptoms progression required urgent chest radiography that established the diagnosis of bilateral pneumothoraces. The treatment was started with bilateral intercostal chest drains. Subsequently, the patient 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 significantly improved by the early surgical treatment.

REFERENCES

1. Itard JE. Dissertation sur le pneumothorax ou les congestions gaseuses quise forment dans la poitrine. (Thesis). Paris; 1803.
2. Luh SP. Diagnosis and treatment of primary spontaneous pneumothorax. J Zhejiang Univ Sci B. 2010; 11(10):735–44.
3. Parrish S, Browning RF, Turner FJ, Zarogoulidis K, Kougioumtz I, Dryllis G, et al. The role for medical thoracoscopy in pneumothorax. J Thorac Dis. 2014; 6(S4):S383–91.
4. Melton LJ, Hepper NCG, Offord KP. Incidence of spontaneous pneumothorax in Olmsted County, Minnesota: 1950–1974. Am Rev Respir Dis. 1979; 120(6):1379–82.
5. Athanassiadi K, Kalavrouziotis G, Loutsidis A, Hatzimichalis A, Bellenis I, Exarchos N. Treatment of spontaneous pneumothorax: ten-year experience. World J Surg. 1998; 22(8):803–6.
6. Wing Sang Chau V, Patel P, Meghjee S. Simultaneous bilateral spontaneous pneumothoraces in a patient with occupational asthma. BMJ Case Rep. 2013; 2013.
7. Wilkie SC, Hislop LJ, Miller S. Bilateral spontaneous pneumothorax—the case for prompt chest radiography. Emerg Med J. 2001; 18:145–6.
8. Sayar A, Turna A, Metin M, Küçükyağci N, Solak O, Gürses A. Simultaneous bilateral spontaneous pneumothorax report of 12 cases and review of the literature. Acta Chir Belg. 2004; 104(5):572–6.
9. Abdala OA, Levy RR, Bibiloni RH, Viso HD, De Souza M, Satler VH. Advantages of video assisted thoracic surgery in the treatment of spontaneous pneumothorax. Medicina (B Aires). 2001; 61(2):157–60.
10. Sahn S, Heffner J. Spontaneous pneumothorax. N Engl J Med. 2000; 342(12):868–74.
11. Graf-Deuel E, Knoblauch A. Simultaneous bilateral spontaneous pneumothorax. Chest. 1994; 105(4):1142–6.
12. Henry M, Arnold T, Harvey J. BTS guidelines for the management of spontaneous pneumothorax. Thorax. 2003; 58(Suppl II):ii39–52.
13. Eguchi T, Hamanaka K, Kobayashi N, Saito G, Shiina T, Kurai M, et al. Occurrence of a simultaneous bilateral spontaneous pneumothorax due to a pleuro-pleural communication. Ann Thorac Surg. 2011; 92(3):1124–6.
14. Barker A, Maratos EC, Edmonds L, Lim E. Recurrence rates of video-assisted thoracoscopic versus open surgery in the prevention of recurrent pneumothorax: a systematic review of randomised and non-randomised trials. Lancet. 2007; 370(9584): 329–35.

Симултани билатерални спонтани пнеумоторакс

Вања Костовски, Александар Ристановић, Небојша Марић, Наташа Вешовић, Љубинко Ђенић

Војномедицинска академија, Клиника за грудну хирургију, Београд, Србија

САЖЕТАК

Увод Симултани билатерални спонтани пнеумоторакс (СБСП) јесте 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.

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 интензивирања тегоба уз појаву агитираности. Анализом гасова артеријске крви утврђена је респираторна инсуфицијенција (тип 2) са параметрима: *pH* = 7,34, $PaCO_2$ = 6,3 *кPa* и PaO_2 = 7,9 *кPa*. 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