# Simultaneous bilateral primary spontaneous pneumothorax

## Sočasni obojestranski primarni spontani pnevmotoraks

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### Abstract

Simultaneous bilateral primary pneumothorax is a very rare (1.6/100,000) and life-threatening condition. Clinical presentation may vary from mild dyspnea to tension pneumothorax. It may be milder particularly in younger patients, but more severe in patients with advanced age, and tube thoracostomy is a life preserver in the latter group. Since mortality and recurrence rates following tube thoracostomy are high, endoscopic approaches to bilateral hemithorax have been reported in literature. Apical wedge resection and pleural procedures are recommended in video thoracoscopy or mini thoracotomy even if no bulla and/or bleb are detected. Bilateral surgical interventions and additional pleural procedures are associated with increased rate of post-operative complications and longer postoperative hospital-stays. As a first-line approach, the surgical method toward any side of lung with air leakage following a previous tube thoracostomy is considered less invasive, especially in younger patients. Here, we present a case of simultaneous bilateral primary spontaneous pneumothorax (SBPSP) in a 21-year old male with no history of smoking and chronic pulmonary disease. A unilateral surgical intervention was performed, and no recurrence was observed during 5-year follow up.

### Izvleček

Sočasni obojestranski primarni pnevmotoraks je zelo redko (1,6/100.000), vendar pa življenje ogrožajoče stanje. Klinična slika se lahko razlikuje v razponu od blage dispneje do tenzijskega pnevmotoraksa. Zlasti pri mlajših bolnikih je lahko blag, med tem ko se pri starejših pojavlja v hujši obliki; pri tej skupini je torakalna drenaža poseg, ki rešuje življenje. Zaradi visoke stopnje umrljivosti in ponovitve bolezni po torakalni drenaži se v literaturi pojavljajo poročila o endoskopskem pristopu pri obojestranskem hemotoraksu. Pri videotorakotomiji ali mali torakotomiji se priporoča klinasta resekcija apeksa pljuč in plevralna drenaža tudi v primeru, če ni prisoten emfizem ali cista. Obojestranski kirurški posegi in dodatna plevralna drenaža so povezani z večjo pojavnostjo pooperativnih zapletov in daljšimi hospitalizacijami. Kirurški poseg na poljubni strani pljuč s puščanjem zraka po predhodni torakalni drenaži velja za manj invaziven pristop prve izbire, posebej pri mlajših bolnikih. V članku predstavljamo primer sočasnega obojestranskega primarnega spontanega pnevmotoraksa pri 21-letnem moškem, ki ni v preteklosti nikoli kadil ali imel kronične pljučne bolezni. Pri njem je bil opravljen enostranski kirurški poseg, v 5-letnem spremljevalnem obdobju pa ni prišlo do ponovitve bolezni.

**Key words:**
simultaneous bilateral primary spontaneous pneumothorax; unilateral surgical intervention; mini thoracotomy; recurrence

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## Introduction

Pneumothorax is the case of abnormal air/gas accumulation between pleural spaces. Primary spontaneous pneumothorax occurs without any underlying lung disease, while secondary spontaneous pneumothorax develops as a result of lung disease.[1] In US, 18 in 100,000 men suffer from primary spontaneous pneumothorax, while the number for secondary spontaneous pneumothorax is 28 in 100,000. In female population, the rates of occurrences for primary and secondary spontaneous pneumothorax are 1.2 and 6, respectively for every 100,000 cases.[2] Clinical findings may change according to the degree of pneumothorax. Tension pneumothorax, although rare, causes cardiovascular collapse and shock.

Although the primary spontaneous pneumothorax is often a common condition, the cases of simultaneous bilateral primary spontaneous pneumothorax (SBPSP) are seen rarely. The occurrences of SBPSP range from 1.3–1.9 % of all cases of spontaneous pneumothorax, and can be fatal if leading to tension pneumothorax. The BTS has recommended the following treatment approach after appropriate diagnosis. In the first stage, if the pneumothorax depth is more than 2 cm, a follow-up is suggested depending on whether there is dyspnea in the patient aspiration or not. In the 2nd stage, the patient is again aspirated if he/she did not relax by initial aspiration. The next follow up is suggested after checking whether the patient is relaxed after repetitive aspiration. If success cannot be achieved after repetitive aspiration, the intercostal drainage is suggested in the 3rd stage.[7] Simultaneous bilateral surgical intervention is accepted as the standard treatment approach for these cases. However, bilateral surgical interventions are associated with an increased rate of complications and longer postoperative hospital stays.

We report a case of SBPSP in a 21-year old male, who received tube thoracoscopy primarily. The part on which continuous air leakage was detected was intervened by surgical treatment. We present this case as it is an effective and less interventional approach.

## Case Presentation

A 21-year old male, attending second year of his marbling high school, presented in our hospital with a history of occasional dyspnea. Although the patient did not have any history of smoking and chronic pulmonary disease, he was diagnosed with pneu-

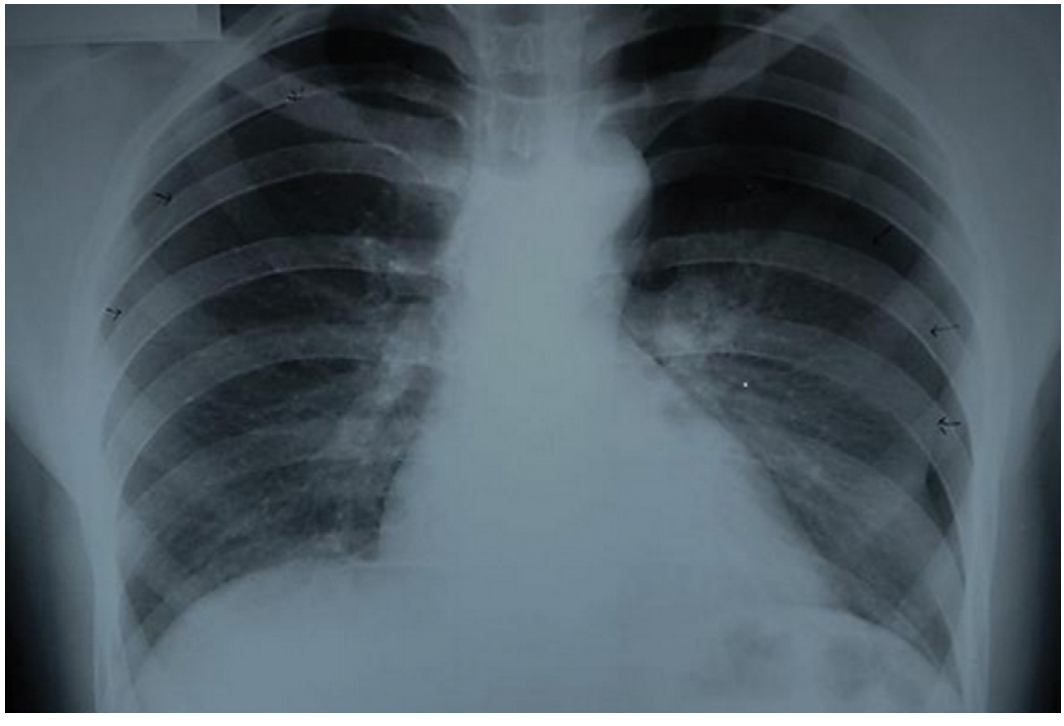

**Figure 1:** Simultaneous bilateral primary spontaneous pneumothorax detected by chest X-ray (while attending the patient in emergency service).

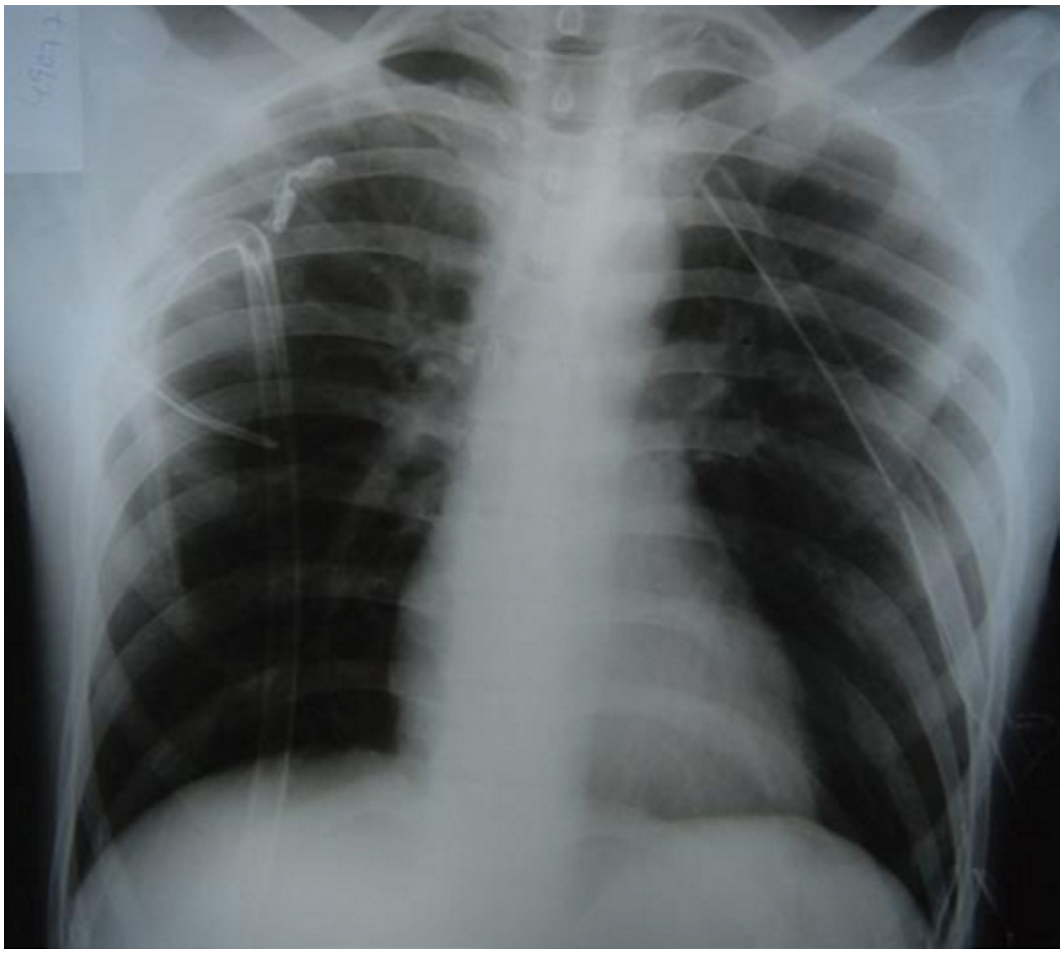

**Figure 2:** Post-operative chest X-ray.

mothorax following an attack of dyspnea. An urgent surgery was recommended after diagnosis. After refusing surgery and a bus journey of 8 hours, he applied to our hospital where his parents lived.

The patient was cyanotic and tachypneic. His oxygen saturation level under room air was 85 %. Besides, his heart rate and blood pressure were 120 beats/minute and 100/85 mmHg. On auscultation, breathing sounds of the right hemithorax was decreased while that of the left one was absent. On chest X-ray (CXR), simultaneous bilateral pneumothorax was detected with being partial as 30–40 % and subtotal as 60 % at right and left hemithorax, respectively (Figure 1).

The patient was informed about the condition, and bilateral closed underwater drainages were applied via tube thoracostomies. Neither bulla nor bleb, but expansion in both lungs was detected on thoracic computed tomography (CT), taken following tube thoracostomy. After 48 hours, air leakage from tube thoracostomies discontinued on the right but continued on the left. On the third day of tube thoracostomy, a mini thoracotomy was applied to the left hemithorax. We had to apply a mini thoracotomy owing to the lack of a thoracoscopic system in our hospital. The surgery was terminated only with apical wedge resection and mechanical abrasion since no bulla was observed. Post-operative chest x-ray showed expanded lungs (Figure 2).

On the fourth post-operative day, air leakage from the left tube thoracostomy ceased. Right tube thoracostomy was terminated on the fourth post-operative day as talc pleurodesis was applied. Left tube thoracostomy, however, was terminated on the fifth post-operative day. He was discharged as both his lungs were expanded, and was recommended to drop out or suspend the school. He was followed up for 5 years (Figure 3). No recurrent pneumothorax was observed.

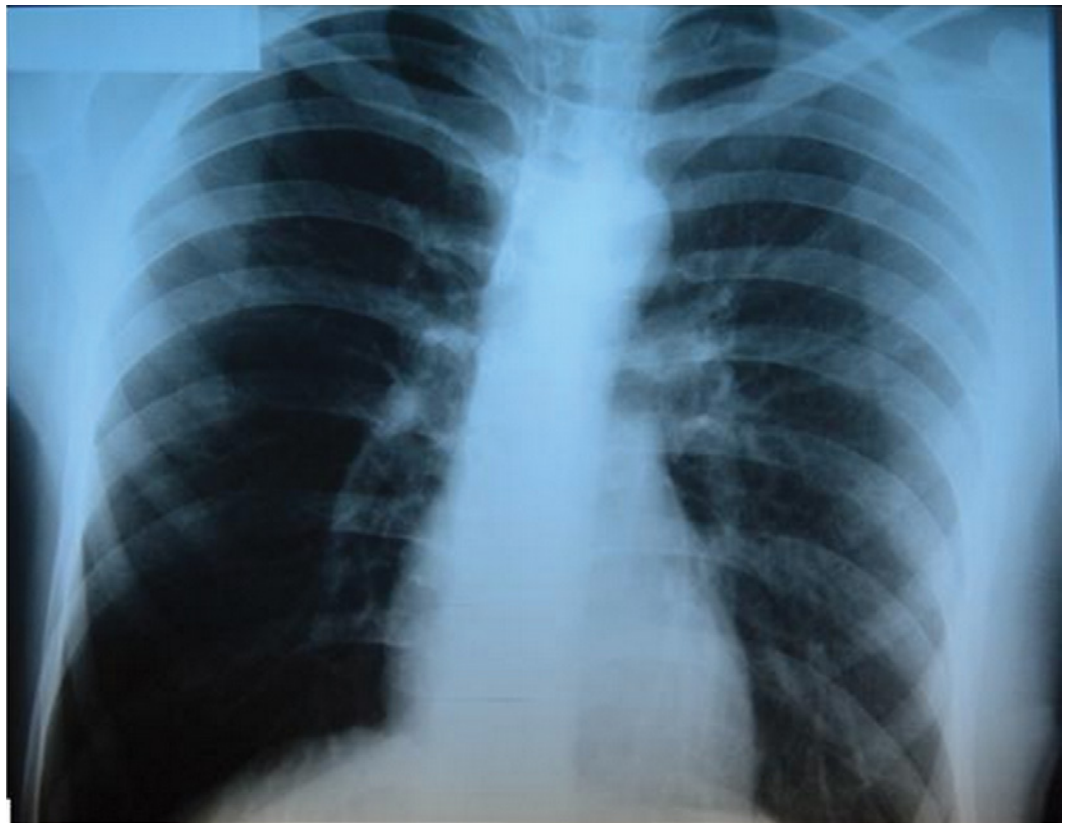

**Figure 3:** Control chest X-ray in the 5th year of follow up.

## Discussion

The overall rate of simultaneous primary spontaneous pneumothorax was reported as 1.6 out of 100,000.[2] Primary spontaneous pneumothorax occurs often as a result of the rupture of apical sub-pleural blebs, and the relation between primary spontaneous pneumothorax and changes like emphysema in the lung was also described in the literature.[3]

Smoking in men increases the risk of primary spontaneous pneumothorax.[4] However, there was no smoking history in our patient. In patients with secondary spontaneous pneumothorax, who were subjected to tube thoracostomy, the recurrence was reported as 43 %, while the recurrence in primary spontaneous pneumothorax was 31.8 %.[5] The rate of pneumothorax recurrence is high, especially in the first 6–24 months.[6] Our patient was approached by unilateral mini thoracotomy. Apical wedge resection by linear stapler and mechanical abrasion were performed. Recurrence was not observed in 5 years of follow-up post unilateral surgical intervention in our patient. Independent risk factors for recurrent pneumothorax are: the presence of pulmonary fibrosis , asthenic case (increase in height and weight rate) and smoking.[6] Our patient had asthenic structure with 175 cm of height, 58 kilograms of weight.

The diagnosis in compliance with the British Thoracic Society pleural disease guideline 2003 (BTS)[7] should be based on the following: (i) standard PA chest radiography on foot; (ii) lateral x-rays; (iii) expiratory graphs; (iv) supine or lateral decubitus x--ray; (v) thorax ultrasound; and (vi) CT scan. Treatment method for pneumothorax was reviewed again in 2003 by the British Thoracic Society. The treatment approach can range from observation to aspiration, closed under-water drainage, thoracoscopy and thoracotomy.[7,8] Bilateral endoscopic surgical intervention was reported as surgical approach for the treatment of simultaneous bilateral spontaneous pneumothorax in the literature. Additional pleural surgical procedures for preventing the recurrence were also suggested. Mini thoracotomy has several advantages according to VATS. Recurrence rate is low by mini thoracotomy (0–7 %). However, this procedure is associated with more pain after surgery and a longer postoperative hospital stay. In this context,

pleurectomy procedures can be performed safely by mini thoracotomy.[9,10] Postoperative hematoma causes pain after pleural procedure and bilateral surgical approach, and this leads to a longer post-operative hospital stay.

Consequently, in young patients, who present with a slighter clinic after tube thoracostomy, approach to hemithorax which the air leakage goes on by mini thoracotomy or thoracoscopic surgery is a less invasive and more effective method than bilateral surgical approach.

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