Spontaneous Contralateral Pneumothorax in a Patient with Low Body Mass Index

Running title: Contralateral pneumothorax and low BMI

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Abstract

Spontaneous pneumothorax is most common in adolescents and young adults. Some of them develop contralateral pneumothorax. We herein report a patient with spontaneous contralateral pneumothorax, whose body mass index (BMI) was 18.8 kg/m^2. For either chest physicians or thoracic surgeons, follow up with recognition of increased risk of the contralateral pneumothorax is important especially in patients with contralateral bullous lesions and low BMI.

Key words: spontaneous pneumothorax; contralateral pneumothorax; body mass index; video-assisted thoracic surgery

Introduction

Spontaneous pneumothorax is troublesome for patients, due to its possibility of recurrence. The average rate of ipsilateral recurrence of spontaneous pneumothorax is 30% (range, 16 to 52%) [1], and the contralateral occurrence rate was around 15% [2-6]. Herein, we present a case with contralateral pneumothorax, which was successfully treated with video-assisted thoracoscopic surgery (VATS).

Case report

An 18-year-old man presented to our hospital with sudden onset of right chest pain. He remained in good health before and denied any recent trauma. His height was 177 cm, body weight was 59 kg, and his body mass index (BMI) was 18.8 kg/m^2. His blood pressure was 110/84 mmHg, heart rate was 70 beats/minute, respiratory rate 24/minute, body temperature 36.6 C, and right breath sounds were diminished on auscultation. Chest roentgenogram showed right pneumothorax without mediastinal shift (Figure 1). Chest CT showed subpleural bulla over left apical segments were found (Figure 2). The patient had undergone VATS for right pneumothorax. Subpleural bullae over the apical segment were excised with endoscopic linear staples. The

patient was discharged on the sixth postoperative day. Five months after the surgery, the patient was seen at our hospital for the sudden onset of left chest pain. At the examination, he was neither cyanotic nor tachypneic, but left hemithoraces was resonant to percussion. Chest roentgenogram showed left pneumothorax (Figure 3). VATS bullae resection with pleural abrasion was performed on the left hemothorax. He was discharged 4 days later and was followed up for 1 month at our outpatient clinic without recurrence.

Discussion

Spontaneous pneumothorax is most common in adolescents and young adults. Due to its possibility of recurrence, spontaneous pneumothorax is sill troublesome for patients. Bullous lesions in the apex are evaluated as risk factors [7]. According to previous studies, the recurrence rate would be 16% to 50% if there was no surgical intervention [1, 8-12]. With surgical treatment, its recurrence rate becomes less than 5% [13]. However, some of them have contralateral recurrence [2-6]. Sihoe et al reported that 53% of patients with spontaneous pneumothorax were found to have contralateral bullous lesions, and it was one of the most important risk factors in contralateral pneumothorax [5]. Mitlehner et al reviewed the value of CT scan in detecting bullae and bleb formation of the lung in 35 patients with spontaneous pneumothorax. CT showed pathological lung changes in 31 of 35 patients. Contralateral bullae and blebs were found in 23 of them. However, no correlation between recurrences and anatomical status such as number, size and distribution of blebs/bullae was found [14]. In addition, some researchers indicated that underweight: lower body mass index (BMI) was also a risk factor of bilateral and contralateral pneumothorax [15-17]. Sadikot et al reported recurrence was more common in taller men and in women [18]. Huang

et al recently reported the spontaneous bilateral and contralateral pneumothorax was significantly more frequent in patients with a lower BMI [16]. They also reported that BMI lower than BMI<18.5 kg/m2 was indicators for patients with spontaneous pneumothorax to receive single-stage bilateral surgery [16]. In our patient, BMI was beyond the cutoff level BMI<18.5 kg/m2, but we must not underestimate the fact that his BMI was low. For spontaneous pneumothorax that could not be treated by lesser procedures, such as observation, manual aspiration, drainage or thoracoscopy, surgical treatment has been the last therapeutic resort. For recurrent ipsilateral or bilateral pneumothorax, or pneumothorax with persistent air leak, bilateral synchronous pneumothorax, it has been widely accepted that surgery is the treatment choice. Tschopp et al reported in a state of the art of management of spontaneous pneumothorax that simultaneous bilateral pneumothorax and contralateral recurrence are quite often indications for surgical treatment of both sides [19]. According to the guideline for the management of spontaneous pneumothorax by British Thoracic Society, contralateral pneumothorax is also one of the accepted indications for operative intervention [7]. Its recommendation is from the standpoint of the statistical and perceived risk of recurrence [7]. Recently Chou et al showed

that the preemptive VATS for the contralateral blebs/bullae effectively prevented the contralateral occurrence [20]. In our patient, single-stage surgery was not performed at the first time of presentation, as the patient did not want to receive VATS in both sides at that time. We underestimated the risk of contratateral pneumothorax because of the size and shape of the bullae that was usually observed. There has no report that evaluated what kinds of bullae will develop pneumothorax. It is expected such studies will be carried out in future. In fact, we referred to thoracic surgeons soon after the diagnosis of contralateral pneumothorax. This single-stage surgery will be one of choices of the common therapies, but it has not yet evaluated as the standard one.

It is important to evaluate the existence of bullous lesion in both sides of the lungs at the first time of presentation of pneumothorax, as a bullous lesion on the contralateral side on the chest CT scan is an independent risk factor for contralateral recurrence. Either chest physicians or thoracic surgeons must follow up with recognition of increased risk of contralateral pneumothorax onset in patients with bullous lesions on the contralateral side as well as low BMI.

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Figure legends

Figure 1. Chest roentgenogram showed right pneumothorax without mediastinal shift.

Figure 2. Chest CT showed subpleural bulla over left apical segments were found.

Figure 3. Chest roentgenogram showed left pneumothorax.

Fig. 1

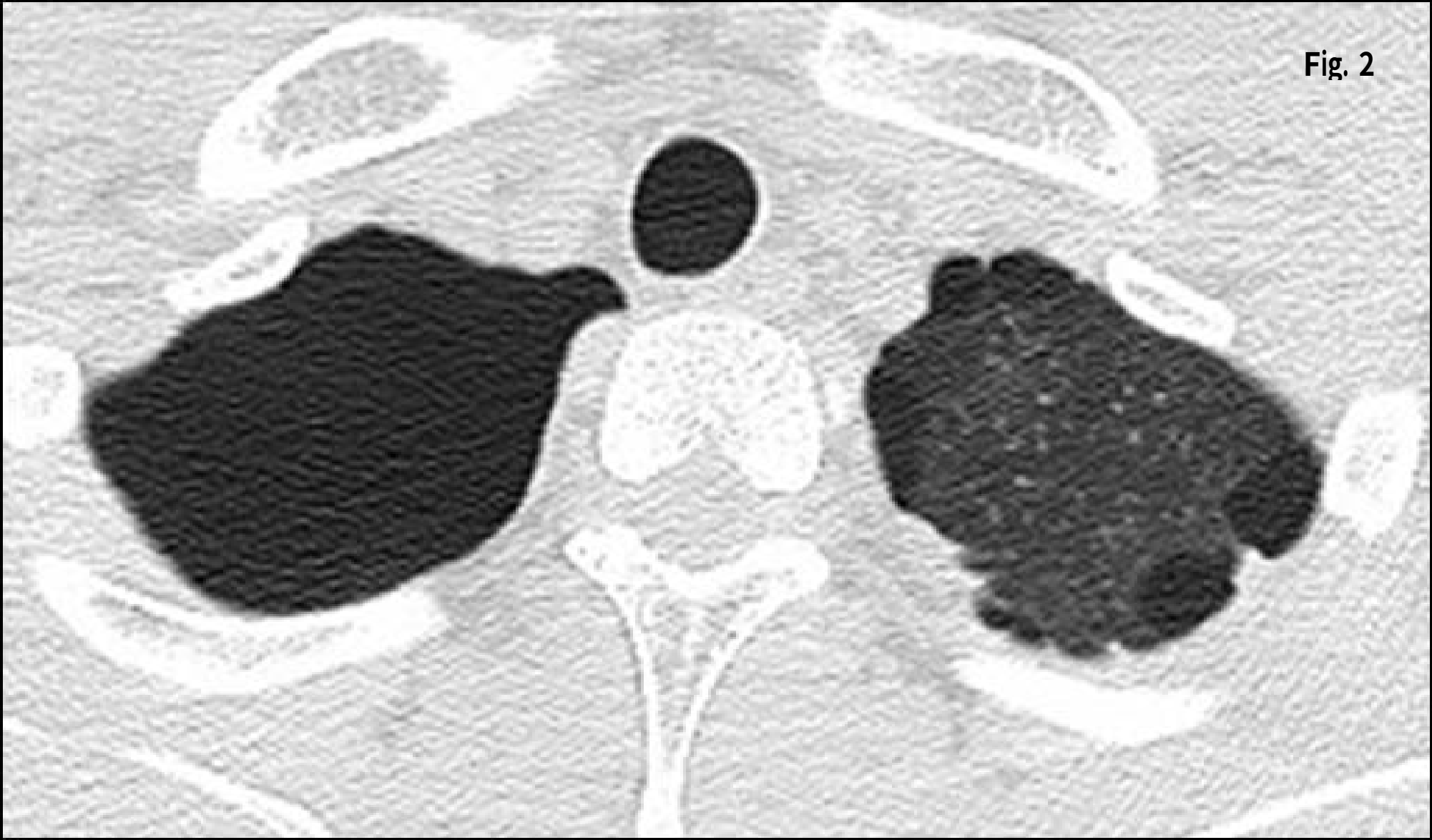

Fig. 2

Fig. 3