

CASE REPORT

An unusual cause of chest pain in army trainee - spontaneous pneumomediastinum

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SUMMARY

This is a case report of spontaneous pneumomediastinum that occurred in a 19-year-old army trainee during his 2.4km run. Spontaneous pneumomediastinum is a rare disorder. It is usually precipitated by activities related to Valsalva manoeuvres such as strenuous physical activities, retching and vomiting. Treatment is expectant and the disorder usually resolves spontaneously within a few days. However, one must be aware of the disorder so that additional advice such as avoiding activities that involve Valsalva manoeuvres can be given.

KEY WORDS:

Spontaneous pneumomediastinum, Pneumomediastinum, Marfan, Marfanoid, Army, Tuberculosis

INTRODUCTION

Spontaneous pneumomediastinum is a rare disorder, with an incidence of about 0.01%. It usually occurs in young individuals. It has a self-limiting course and there is no recurrence in most cases. Patients with spontaneous pneumomediastinum usually present with chest pain, dyspnoea and throat pain. Hamman's sign is the most distinctive physical finding while subcutaneous emphysema is the most common physical finding in patients with spontaneous pneumomediastinum.¹

CASE REPORT

This is a case report of spontaneous pneumomediastinum that occurred in a 19 years old army trainee during his 2.4km run. One day prior to his admission, he was undergoing a parachute jumping exercise. This involved strapping on a 70kg parachute suit, and practising a parachute landing fall from a height of 1m. Thereafter, he would do two rounds of 2.4km run with the parachute strapped on.

He developed chest pain after his 2.4km run leading to attendance at the Emergency Department. His pain was promptly resolved with diclofenac sodium. The next morning, he had another episode of chest pain without any precipitating factors, which resolved completely with analgesia. He then went for further training in parachute jumping where he developed severe chest pain which was not relieved by analgesia; and it was so severe that he almost "blacked out".

On admission, his pain score was 5/10. Clinical examinations were normal except for some Marfanoid features – high arch palate, arachnoidactyly, and positive wrist and thumb signs. The site of his pain corresponded to the strapping position of his parachute. His laboratory results, electrocardiogram and echocardiogram were normal. Chest X-rays showed a focal right upper zone infiltrate. A computed tomography (CT) of the chest was ordered in view of inconclusive results thus far and to rule-out aortic dissection and pneumothorax. CT showed a pneumomediastinum (see Figure 1) and right upper lobe opacities in a "tree-in-bud" configuration - an incidental finding of asymptomatic pulmonary tuberculosis (see Figure 2).

We revisited his history in the light of his CT findings, and uncovered an episode of nausea and retching after his 2nd 2.4km run; and that his chest pain followed immediately after his retching. His pneumomediastinum resolved with symptomatic management. In addition, he was initiated on anti-tuberculosis treatment and his sputum subsequently grew Mycobacteria tuberculosis.

DISCUSSION

A systematic search of the MEDLINE database from 1946 to March 2015 was performed using the medical subject heading word "mediastinal emphysema" and "pneumomediastinum" as a keyword. Search results were then cross-referenced with medical subject heading "tuberculosis" and keyword "marfan*". Our search showed that there has not been any reported case of pneumomediastinum or spontaneous pneumomediastinum in a Marfanoid patient. However, there is a reported case of pneumomediastinum in a patient with suspected forme fruste of Marfan syndrome.² Furthermore, our search showed that cases that are associated with pneumomediastinum in patients with tuberculosis are usually those with cavitory pulmonary lesions, miliary tuberculosis or tuberculosis with mediastinal lymph node involvement. Our patient didn't have any of these features, and the site of his tuberculous infection is distant from the mediastinum. Thus, I believe that in our patient, the pneumomediastinum is likely a result of his retching and is unlikely due to his Marfanoid features or pulmonary tuberculosis. However, I cannot completely rule out the possibility that the development of pneumomediastinum in our case is in fact related to forme fruste of Marfan syndrome because of a case reported by

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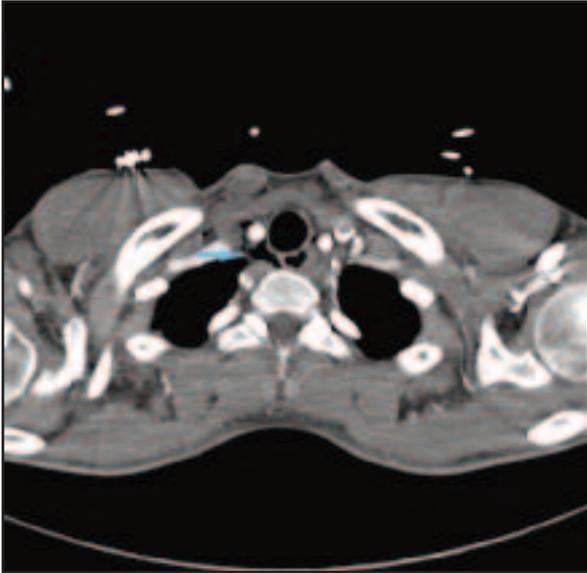


Fig. 1: Computed tomography chest showing the presence of pneumomediastinum (blue arrow).

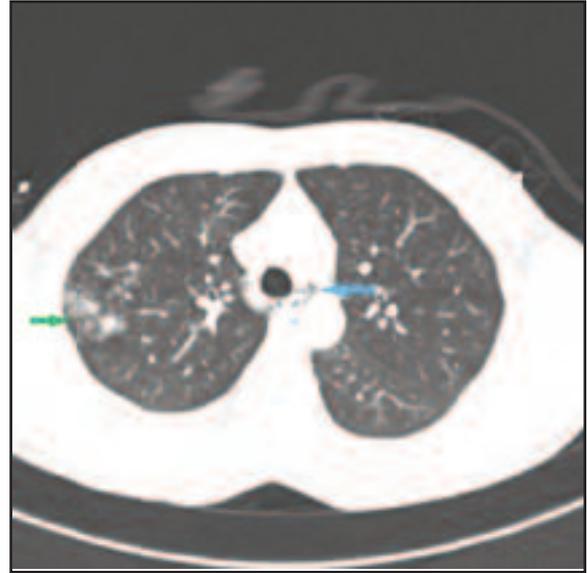


Fig. 2: Computed tomography chest showing a cluster of "tree-in-bud" nodular opacities in the right upper lobe (green arrow) and the presence of pneumomediastinum (blue arrow).

Fujimoto *et al.*² But this is less likely in view of the tempo of events leading to the development of pneumomediastinum in our case.

Spontaneous pneumomediastinum is a rare disorder that usually occurs in young adult males.¹ It usually resolves spontaneously within a few days with analgesia and rest; and complications are rare. The three most common symptoms are chest pain (68%), dyspnoea (44%) and throat pain (28%); while the most common sign is subcutaneous emphysema (68%).¹ It is believed that spontaneous pneumomediastinum is a result of alveolar rupture due to an increase in intra-alveolar pressure.^{3,4} Most cases of spontaneous pneumomediastinum are related to activities that result in forceful Valsalva manoeuvres such as strenuous physical activities, coughing and vomiting.^{3,5} A posterior-anterior chest X-ray will miss about 30% of the cases. Getting an additional view with a lateral chest X-ray will increase the yield of chest x-rays by 50%. However, a diagnostic CT chest is indicated when the index of suspicion is high and chest x-ray is normal or equivocal. It has a sensitivity of 100%.^{1,3-5} Treatment is generally expectant with analgesia and an avoidance of further triggering events such as coughing and vomiting.^{3,5}

Spontaneous pneumomediastinum has been reported as a rare disorder, but the actual incidence may be higher than stated as one needs to be aware of this disorder in order to have a high index of suspicion in appropriate cases. This is because the symptoms are non-specific, the signs may not be present, chest x-rays can be normal, and the disorder resolves spontaneously.

Our patient didn't have any productive sputum for collection to test for pulmonary tuberculosis. In order to avoid inducing a Valsalva reaction in our patient during the collection process, laryngeal swabs were carried out instead of aspiration through nasogastric tube to collect a specimen to test for tuberculosis. It was well tolerated by our patient and it confirmed that our patient had asymptomatic pulmonary tuberculosis coincidentally.

CONCLUSION

Spontaneous pneumomediastinum is a rare clinical entity. It shows the importance of a careful detailed history, and that one should maintain a high clinical suspicion in cases involving young adult males with any antecedent strenuous "Valsalva type" activities.

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