EMERGENCY CASEBOOK

Case of the month: Buffalo chest: a case of bilateral pneumothoraces due to pleuropleural communication

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Simultaneous spontaneous bilateral pneumothoraces, the presentation of separate right and left pneumothoraces together, is a rare event. The pleural cavities in humans are separated completely and the only previous reports of pleuropleural communication have been associated with major invasive thoracic procedures, specifically mediastinal surgery. The term ''buffalo chest'' has been coined for the condition on the basis that the buffalo or bison has a single pleural cavity, one of the few mammals to do so. We present the case of a woman with a past history of a single right sided spontaneous pneumothorax but no major thoracic surgery, who presented to the emergency department with a second spontaneous right pneumothorax that was under tension. After thoracostomy, she was found to have bilateral pneumothoraces which resolved with a unilateral chest drain demonstrating pleuropleural communication. We believe this to be the first reported case of such a presentation in the literature. The case demonstrates an unusual emergency presentation of a rare anatomical anomaly.

Simultaneous spontaneous bilateral pneumothoraces, the presentation of separate right and left pneumothoraces together is a rare event. This occurrence is associated with chronic lung disease, male sex, smoking, height and *Pneumocystis carinii* infection.[1] The pleural cavities in humans are completely separate and the only previous reports of pleuro-pleural communication have been rare events associated with invasive thoracic procedures, specifically mediastinal surgery. The term ''iatrogenic buffalo chest'' has been coined for the condition on the basis that the buffalo or bison has a single pleural cavity; one of the few mammals to do so. This proved a disadvantage for the North American buffalo, as a single arrow strike from a Native American into the buffalo's chest would probably cause both lungs to collapse, rendering the animal incapacitated.[2] One previous report described a presentation of bilateral pneumothoraces after an elective unilateral lung biopsy,[3] while another described the condition discovered in a young child electively at time of surgery for pectus excavatum.[4]

We present the case of a female non-smoker with a past history of a single right sided spontaneous pneumothorax and right apical bulla who presented to the emergency department with a second spontaneous right pneumothorax that was under tension. After thoracostomy she was found to have bilateral pneumothoraces with pleuro-pleural communication. We believe this to be the first reported case of such a presentation in the literature.

CASE REPORT

An 18 year old woman presented to the emergency department with breathing difficulties. She had a past medical history of epilepsy, scoliosis, right pneumothorax, and Rett's syndrome (an X linked autism-like disorder associated with microcephaly and fits, but not with cardiovascular or respiratory abnormalities). Previous chest radiograph and thoracic computed tomography scan had revealed a right apical bulla.

On initial examination, the patient was distressed and pale, and SaO_2 was 92% on 100% O_2. Her pulse was 130 beats/min and blood pressure 99/56 mmHg. Chest examination showed decreased air entry and hyperresonance on the right side. The patient was managed in the resuscitation room, facilitating a rapid portable chest radiograph. This showed a right sided tension pneumothorax and scoliosis of the spine (fig1A). A 12F thoracostomy tube was inserted in the seventh intercostal space using the Seldinger technique under sedation. Sedation was required to alleviate distress in the patient owing to her learning difficulties. A trochar was not used after initial insertion of a short needle into the pleural space to facilitate guide wire insertion; a firm blunt plastic guide supplied with the tube was used for positioning. Air was noted to bubble into the drain and her oxygen saturations improved. A repeat chest radiograph was performed. This showed a failure to inflate the right lung, but release of the tension, poor positioning of the drain, and a contralateral left sided pneumothorax was now noted (fig 1B). An open thoracostomy tube (28 Fr) was then inserted in the right hemithorax in the sixth intercostal space. Another chest radiograph was performed, which showed adequate position of the thoracostomy tube and resolution of both pneumothoraces (fig 1C). The patient was admitted to the intensive care unit and subsequently continued to have an air leak into the right hemithorax. She was transferred to a cardiothoracic unit where a bullectomy was performed, and she had an uneventful post-operative course after this procedure. The cardiothoracic surgeon failed to note any detectable pleuro-pleural communication at operation.

DISCUSSION

We believe this to be the first reported case of bilateral pneumothoraces presenting as a spontaneous unilateral tension pneumothorax in a patient who had not undergone cardiothoracic surgery. Is it possible that the first chest drain placed for the right tension pneumothorax could have damaged the pleura to make a connection between the right and left pleural cavities? Could this have perhaps been aided by the raised intrapleural pressure on the right, enlarging a small connection into a larger one? Such a complication has not previously been described and seems unlikely. Reported early complications of intercostal tube drainage include penetration of the major organs such as lung, stomach, spleen, liver, heart, and great vessels, and are potentially fatal. These complications occur more commonly when a sharp metal trocar is inappropriately applied during the procedure. Another reported early complication is surgical emphysema.[5]

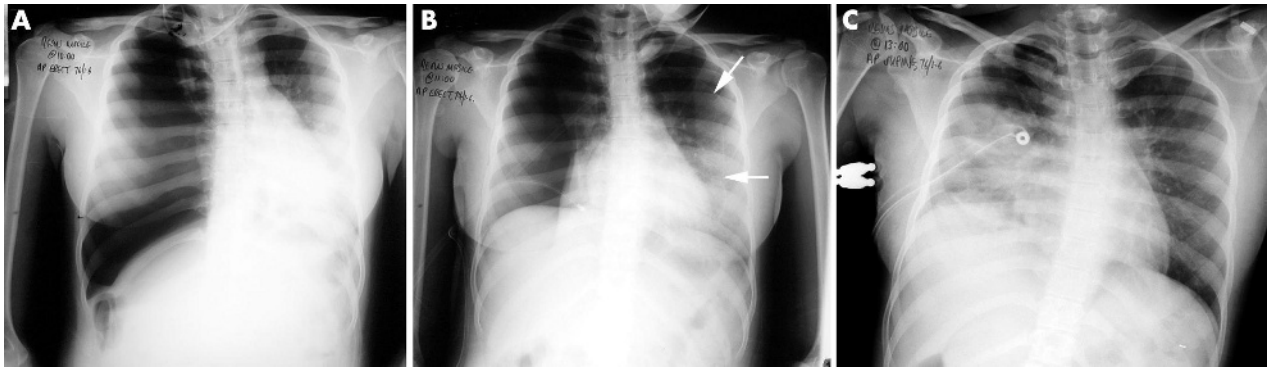

Figure 1 (A) Right sided tension pneumothorax with mediastinal shift and no evidence of left sided pneumothorax; (B) note thoracostomy tube, failure to re-expand right lung, release of tension, and left pneumothorax (arrows); (C) note new right thoracostomy tube and resolution of bilateral pneumothoraces.

It seems more likely that there was a pre-existing communication between the two pleural cavities. Given our presentation of buffalo chest in a patient with scoliosis, it would be reasonable to speculate that the condition may be related to developmental thoracic skeletal deformity, although there is no evidence to support this.

The patient in this case was known to have an apical bulla on the side where she had previously had a pneumothorax, but had no other chronic chest pathology. The diagnosis of buffalo chest in this case was made on the re-expansion of the contralateral lung after insertion of a thoracostomy tube on the originally presenting side.

It should be noted that the traditional approach to the management of suspected tension pneumothorax is to perform needle decompression prior to performing chest radiography. More recently, the option of confirming the diagnosis by performing an urgent radiograph has been suggested.[6] This approach is appropriate only in self ventilating patients in a high dependency setting such as a resuscitation room. When a chest radiograph is taken, a practitioner capable of urgent decompression should stay with the patient.

We believe this to be the first reported presentation of buffalo chest as a spontaneous pneumothorax in a patient who has not had major thoracic surgery. The case demonstrates an unusual emergency presentation of a rare anatomical anomaly.

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