

# Pneumomediastinum in a surf lifesaver

K E Fallon, K Foster

## Abstract

**Pneumomediastinum is an uncommon complication of sporting activity. The case of a young asthmatic surf lifesaver is reported in which several factors are thought to have been involved in the aetiology of his condition. Treatment was expectant and a full recovery was made over a short period. This is the first reported case of pneumomediastinum occurring following training for a surf belt race.**

(Br J Sports Med 1996;30:359-360)

Key terms: pneumomediastinum; surf lifesaving; asthma

## Case report

A 20 year old professional lifeguard and competitive surf club swimmer presented with a four hour history of sore throat which he had noticed upon wakening. He had a long history of mild asthma which was predominantly exercise induced and effectively blocked by taking inhaled salbutamol before exertion. On the preceding evening he had suffered a mild nocturnal attack of asthma which settled rapidly without medication.

The previous day he had trained for a surf belt race which he had found more difficult than usual. He did not use prophylactic medication before this episode of exercise. The surf belt race is an event in which a swimmer has a wide belt placed firmly around his abdomen. This is attached to a rope fed from a large reel through the hands of four lifesavers stationed on the beach. The swimmer races through the surf to a potential drowning victim and brings him back to the shore. The patient complained that during this event he had to strain against the belt and rope as his team mates were not feeding him sufficient line. Such an occurrence tends to cause the swimmer to swim for longer periods underwater than is usual.

On examination the patient was not dyspnoeic and the throat was normal. The lung fields were normal to auscultation, as were the heart sounds. Subcutaneous emphysema was found in both sides of the neck and across the upper chest. The remainder of the physical examination was unremarkable. Spirometry revealed a forced expiratory volume in one second (FEV<sub>1</sub>) of 3.97 litres (100% of predicted), a forced vital capacity (FVC) of 5.10 litres (108% of predicted), and an FEV<sub>1</sub>/FVC ratio of 77.8%. A chest x ray was reported as showing pneumomediastinum and subcutaneous emphysema.

The patient was treated expectantly and the management of his asthma was reviewed.

Three days following the initial consultation he complained of left sided chest pain on very deep inspiration and the surgical emphysema had clinically resolved. Chest x ray two weeks later was normal.

## Discussion

Pneumomediastinum is a relatively rare condition which has been associated with mechanical ventilation, childbirth, marked vomiting and coughing,<sup>1</sup> marijuana smoking,<sup>2</sup> asthma, closed tracheal injury, and anorexia nervosa. In relation to athletic activity it has been described following swimming,<sup>3,7</sup> tennis,<sup>3</sup> weight lifting,<sup>3,4</sup> football,<sup>5,7</sup> mountain climbing,<sup>6</sup> rugby training,<sup>8</sup> fast bowling in cricket,<sup>9</sup> scuba diving,<sup>10-12</sup> and kendo.<sup>13</sup>

In a general population study the mean age of patients with spontaneous pneumomediastinum was 18.8 years and 84% were male. The most common symptoms on initial presentation are chest pain (88%), dyspnoea (60%), and neck pain (48%), the most frequent physical sign being subcutaneous emphysema (60%) most commonly found in the neck (40%).<sup>3</sup> Auscultation may reveal a crunching sound during systole—Hamman sign—which was reported in 52% of cases in one series.<sup>14</sup> Should sufficient air accumulate in the mediastinum the pleura can rupture, resulting in an associated pneumothorax. Particularly in cases of traumatic aetiology, oesophageal rupture (Boerhaave syndrome) should be excluded. Treatment of non-traumatic cases is expectant and does not usually require hospital admission. Resolution occurs rapidly and complications such as pneumothorax and airway compromise are rare.<sup>14,15</sup>

Cases described in the athletic population occurred in young males,<sup>4,5,7-9</sup> most presenting with anterior chest pain,<sup>4,5,7,9</sup> and were associated with straining which may have involved a Valsalva manoeuvre<sup>4,8,9</sup> or a direct blow to the chest.<sup>5,7</sup> In no case so far reported has asthma been a potential aetiological factor.

The patient in this case is again a young male who presented with a sore throat, a presentation previously reported.<sup>8</sup> His history indicates that the onset of pneumopericardium was related to severe exertion possibly associated with Valsalva manoeuvres, breath holding, underwater swimming, and abdominal compression by the surf belt. Chronic but apparently well controlled asthma may well have been a factor since, while the patient was asymptomatic at the time of his swim, subclinical airways obstruction and associated alveolar distension may well have been present. The patient's usual asthma prophylactic medication was not used before exertion.

**Australian Institute of Sport, Canberra, ACT, Australia**

K E Fallon, senior lecturer in sports medicine

**Gosford District Hospital, Gosford, NSW, Australia**

K Foster, consultant physician

Correspondence to: Dr Kieran Fallon, Australian Institute of Sport, PO Box 176, Belconnen ACT 2616, Australia.

Accepted for publication 5 June 1996

It is conceivable that the onset of pneumomediastinum occurred during the episode of asthma on the night before presentation; however, the mild nature of this attack suggests otherwise. This attack was probably a factor in increasing the amount of mediastinal air following the initial leak initiated by the patients unusual exertion.

This case represents the first report of pneumomediastinum occurring as a result of surf lifesaving. Of importance is the associated history of mild chronic asthma and this case also represents the first description of this complication of asthma in an asthmatic athlete. The importance of impeccable control of asthma in the athlete—and in particular the monitoring of lung function before activities involving straining and the Valsalva manoeuvre—and the correct use of prophylactic medication is highlighted.

- 1 Munsell WP. Pneumomediastinum: a report of 20 cases and review of the literature. *JAMA* 1967;202:689-93.
- 2 Miller E, Spiekerman RE, Hepper NG. Pneumomediastinum resulting from performing Valsalva manoeuvres during marijuana smoking. *Chest* 1972;62:223-4.

- 3 Abolnik I, Lossos IS, Breuer R. Spontaneous pneumomediastinum: a report of 25 cases. *Chest* 1991;100:93-5.
- 4 Casamassima AC, Sternberg T, Weiss F. Spontaneous pneumopericardium: a link with weight lifting? *Phys Sports Med* 1991;19:107-10.
- 5 Morgan EJ, Henderson DA. Pneumomediastinum as a complication of athletic competition. *Thorax* 1981;36:155-6.
- 6 Vesik A, Houston CS. Mediastinal emphysema in mountain climbers. *Heart Lungs* 1977;6:799-800.
- 7 Doyle M, Given F. Pneumomediastinum as a complication of athletic activity. *Ir J Med Sci* 1987;156:272-3.
- 8 Haynes RJ, Evans RJ. Pneumomediastinum after rugby training. *Br J Sports Med* 1993;27:37-8.
- 9 Cements MR, Hamilton DV. Pneumomediastinum as a complication of fast bowling in cricket. *Postgrad Med J* 1982;58:435.
- 10 Edmonds C, Lowry C, Pennefather J. *Diving and subaquatic medicine*. Oxford: Butterworth Heinemann, 1992:97-9.
- 11 Raymond LW. Pulmonary barotrauma and related events in divers. *Chest* 1995;107:1648-52.
- 12 Harker CP, Neuman TS, Olson LK, Jacoby I, Santos A. The roentgenographic findings associated with air embolism in sport scuba divers. *J Emerg Med* 1993;11:443-9.
- 13 Komatsu H, Enzan K, Mitsuhashi H, Hasegawa J, Matsumoto S, Suzuki M, et al. A case of pneumomediastinum caused by closed tracheal injury during the game of Kendo (Japanese fencing) [in Japanese]. *Masui - Jpn J Anaesthesiol* 1992;41:673-6.
- 14 Panacek EA, Singer AJ, Sherman BW, Prescott A, Rutherford WF. Spontaneous pneumomediastinum: clinical and natural history. *Ann Emerg Med* 1992;21:1222-7.
- 15 Bratton SL, O'Rourke PP. Spontaneous pneumomediastinum. *J Emerg Med* 1993;11:525-9.

## Exercise induced leg pain—chronic compartment syndrome. Is the increase in intra-compartment pressure exercise specific?

Nat Padhiar, John B King

### Abstract

**Intra-compartment pressure studies remain the main investigative method in diagnosing chronic compartment syndrome (CCS). Standard exercise protocols have been used to cause the raise in pressure measured in the laboratories. This case suggests that CCS cannot be excluded without the specific sports activity being used to raise the intracompartmental pressure.**

(*Br J Sports Med* 1996;30:360-362)

Key terms: chronic compartment syndrome; intra-compartmental pressure; exercise

Exercise induced leg pain is a common

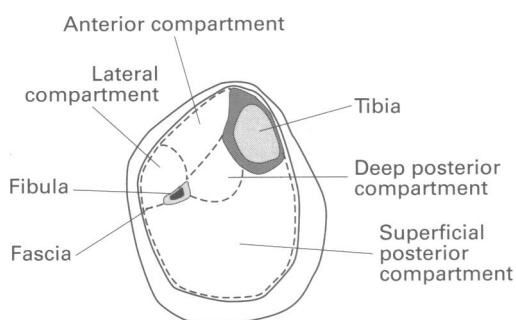


Figure 1 Transverse section through the left leg showing the four compartments.

problem encountered by young athletes after an increase in activity or at the start of the season.<sup>1</sup> The terms shin splints<sup>2</sup> or freshers leg<sup>3</sup> are often used to describe the condition. These terms are non-specific and are falling out of favour. The pivotal symptom is pain, which occurs on exercise and is relieved by a variable period of rest. The cause of pain will usually fall into one of the following four categories:

- (1) Pain of bony origin, for example focal stress fracture or diffuse micro-stress fractures.<sup>4,6</sup>
- (2) Pain of osteofascial origin, for example periostitis and medial tibial stress syndrome.<sup>7,8</sup>

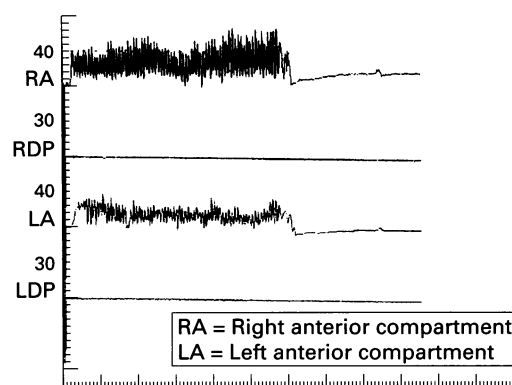


Figure 2 Pressure change following jogging on the spot.

Department of Sports Medicine, The London Hospital Medical College, London E1 4DG, United Kingdom  
N Padhiar, honorary consultant podiatrist  
J B King, consultant orthopaedic surgeon

Correspondence to:  
Mr N Padhiar.

Accepted for publication  
20 February 1996



## Pneumomediastinum in a surf lifesaver.

K E Fallon and K Foster

*Br J Sports Med* 1996 30: 359-360  
doi: 10.1136/bjasm.30.4.359

---

Updated information and services can be found at:  
<http://bjsm.bmj.com/content/30/4/359>

---

### Email alerting service

*These include:*

Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

---

### Notes

---

To request permissions go to:  
<http://group.bmj.com/group/rights-licensing/permissions>

To order reprints go to:  
<http://journals.bmj.com/cgi/reprintform>

To subscribe to BMJ go to:  
<http://group.bmj.com/subscribe/>