Postpartum spontaneous pneumomediastinum and subcutaneous emphysema: Hamman's syndrome

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Summary: This is a case report of a spontaneous pneumomediastinum and surgical emphysema in a 32-year-old woman presenting a few hours after forceps vaginal delivery with symptoms of chest tightness, shortness of breath and swelling in the neck, which resolved with conservative management. It is a rare but potentially dangerous complication of labour, which can be accurately diagnosed with clinical features and chest X-ray. The treatment is conservative as it is usually self-limiting and recurrence in subsequent pregnancies is extremely rare.

Keywords: high-risk pregnancy, thoracic medicine, pneumomediastinum

CASE REPORT

A 32-year-old fit and well Caucasian woman with an uneventful pregnancy presented in spontaneous labour at 40 weeks. This was her second pregnancy and the previous was a miscarriage at eight weeks. She was a non-smoker and her body mass index was 23. The progress in the first stage was good and lasted 10 hours. She had an epidural for analgesia and after one hour of passive descent started pushing. The baby weighing 4.2 kg was delivered by forceps due to failure to progress after 1 and a 1/2 hours of pushing.

Twelve hours after delivery, she reported swelling in the neck, chest tightness and shortness of breath. Her vital signs were stable and oxygen saturation on air was 98%. On examination, there was subcutaneous crepitus in the neck and chest. Chest auscultation revealed bilateral decreased air entry. Chest X-ray was performed which showed pneumomediastinum and minimal pneumothorax (Figure 1). She was reviewed by the medical team and a diagnosis of Hamman's syndrome was made. She was managed conservatively and the symptoms slowly settled over the next two days. Subcutaneous emphysema continued to resolve and repeat chest X-ray after 72 hours revealed resolving pneumomediastinum. She was discharged home with no other postpartum problems. The six-week postnatal check showed complete resolution of subcutaneous emphysema.

DISCUSSION

Hamman's syndrome is a syndrome of spontaneous subcutaneous emphysema and pneumomediastinum associated with pain.¹ It is a rare but potentially serious complication of labour named after Louis Hamman (1877–1946), the physician who described pneumomediastinum in association with

subcutaneous emphysema during pregnancy in 1945. Incidence is rare and estimated at one in 100,000 deliveries² and around 200 cases have been reported worldwide so far. It occurs mostly in healthy primiparous women and in the second stage of labour. Reeder³ reviewed 187 cases and reported that most women were primiparous, mean length of labour and fetal size was within normal limits. In our case, the first stage was normal but the second stage was prolonged and the baby weighed 4.2 kg. Other events outside pregnancy reported in association with this syndrome include forceful coughing, related to bronchospasm in asthma, and vomiting.⁴ The syndrome is also associated with inhalational drug use in which the user performs forceful Valsalva to enhance the drug effect.⁵ The case reported here had no history of asthma or respiratory infection or severe vomiting during labour.

The intra-alveolar pressure is acutely increased during the Valsalva manoeuvre causing rupture of marginal alveoli adjacent to blood vessels. The free air tracks from ruptured alveoli along peribronchial vascular sheaths towards the hilum of the lung. From there, it extends proximally within the mediastinum. The air can dissect along bronchi and vessels and spread in the mediastinum, pericardium, neck, subcutaneous tissue and retroperitoneum.⁶ The absence of transverse fascial planes in the mediastinum allows the unobstructed passage of air along tissue planes into the neck and around the larynx. The air may also track between the parietal and visceral pleura causing a pneumothorax. The pressure of the interstitial air rarely causes respiratory compromise.

The most common symptoms are chest pain, dyspnoea, swelling of face and neck.

The crepitus palpable in the face and neck is pathognomonic of the condition.⁷ Other symptoms include change of voice, cough, sore throat, tachycardia, dysphagia and haemoptysis. A characteristic sign is the peculiar bubbling or crunching sounds over the heart, synchronous with the cardiac cycle known as Hamman's sign or murmur.¹ In our case, the woman presented 12 hours after the delivery with symptoms

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Figure 1 Chest X-ray showing pneumomediastinum and minimal pneumothorax

of swelling of the neck, chest tightness and shortness of breath. The crepitus on neck and thorax was obvious but there was no typical Hamman's murmur.

The definitive diagnosis is made by chest X-ray demonstrating pneumomediastinum and subcutaneous air.⁸ In some cases, computed tomography imaging may be necessary if chest radiography is not sufficient in demonstrating pneumomediastinum. The differential diagnoses include pulmonary embolism, amniotic fluid embolism, myocardial infarction, aortic dissection, pericarditis and mediastinitis. Additional investigations are rarely needed as the diagnosis is mostly evident on chest X-ray.⁹

Contrast radiology is useful if there is any suspicion of an oesophageal tear.¹⁰ It is important to rule out oesophageal rupture as vomiting is not uncommon in labour.

Treatment is conservative including oxygen, analgesia and sedation. The condition is usually self-limiting and recovery generally takes place in 3–14 days.¹¹ Only four cases of maternal deaths are reported, all before 1908.³ The patient should be reassured about the good prognosis and spontaneous resolution. In patients with severe cyanosis and dyspnoea, a small incision over the suprasternal notch to relieve the

pressure and airway obstruction is used.^{1,12} The use of entonox analgesia is contraindicated because it readily comes out of solution and causes expansion of the pneumomediastinum.⁵ Maternal involuntary pushing may be effectively controlled with epidural analgesia. Intermittent positive pressure ventilation is best avoided as it can potentially induce a pneumothorax. Recurrence is rare but some authors recommend the use of forceps routinely in any subsequent pregnancy.¹³

DECLARATIONS

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