CASE REPORT

Spontaneous pneumomediastinum (Hamman's syndrome): a rare cause of postpartum chest pain

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SUMMARY

We present a case of a 28-year-old primiparous woman with facial swelling followed by acute chest pain immediately after delivery. Chest radiograph revealed pneumomediastinum and surgical emphysema. She recovered well within 24 h of observation and conservative management. Postpartum spontaneous pneumomediastinum should be considered in the differential diagnosis of sudden-onset postpartum chest pain immediately or a few hours after delivery. It is a rare benign condition and usually resolves spontaneously without serious consequences. Chest X-ray is the single most important diagnostic test. It is important to rule out other serious and life-threatening conditions. Prolonged pushing, difficult labour and use of inhalational drugs place young primiparous women at higher risk. Recurrence is uncommon in subsequent pregnancy and management is unclear, although expectant management with epidural analgesia to prevent recurrence in subsequent pregnancy is suggested.

BACKGROUND

Spontaneous pneumomediastinum presenting in the postpartum period as chest pain is a very rare presentation. Postpartum pneumomediastinum (Hamman's syndrome) is a very rare event, mainly occurring in the second stage of labour. Symptoms usually appear in the immediate postpartum period, presenting with acute chest pain, shortness of breath, neck swelling and surgical emphysema. We present a case in which chest radiograph clinched the diagnosis; we successfully treated the patient conservatively.

CASE PRESENTATION

A 28-year-old previously fit and healthy primigravida was admitted to the delivery suite at 36 weeks of gestation with regular contractions. Pregnancy and antenatal scans were uneventful. The patient was allergic to ibuprofen.

Initial assessment revealed her cervix to be 7 cm dilated; fetal heart rate was normal. A half hour later, she had an urge to push, and repeat vaginal examination showed a nearly fully dilated cervix with intact membranes. She was bearing labour pain with Entonox.

One hour later, the patient started active pushing. Vaginal examination revealed she was fully dilated but still with intact membranes. Artificial rupture of membranes was performed and she continued actively pushing with good progress. Approximately 2½ h later, she had a spontaneous vaginal delivery of a live born male infant. Syntometrine injection was given.

Immediately after delivery, the patient reported facial puffiness and swelling of eyelids. Placenta was immediately delivered and her medication review showed only syntometrine. Approximately 8 min later, she reported central chest pain (pain scale 5 of 10) and an initial diagnosis of anaphylactic reaction was made; appropriate treatment was given.

Careful examination revealed obvious facial and neck swelling, with palpable neck and right chest wall surgical emphysema. Hoarseness of voice was also noted. Blood pressure was 110/70 mm Hg and heart rate 120 bpm. Chest examination revealed clear lungs without increased breathing.

INVESTIGATIONS

Oxygen saturation was 99% on air and blood gases showed pH 7.43 with low pCO₂ (4.2 kPa) and low O₂ (11 kPa). Pulmonary embolus was suspected and an urgent chest X-ray was taken, revealing surgical emphysema in the neck and right chest wall, with pneumomediastinum (figure 1).

DIFFERENTIAL DIAGNOSIS

Pneumothorax, pneumopericardium and pneumomediastinum were considered clinically, but after chest radiograph, a diagnosis of pneumomediastinum was clear.

Figure 1 Chest X-ray showing pneumomediastinum (arrow)—note cervical and right thoracic wall surgical emphysema.

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TREATMENT

The patient was conservatively managed with analgesics and antibiotics. She received supplementary oxygen to get air into the mediastinum and surgical emphysema to help absorb the air. She felt much better the next morning, with no chest pain; her facial and neck swelling also improved.

OUTCOME AND FOLLOW-UP

The patient was discharged after 24 h of observation. At 4 years follow-up she is healthy and asymptomatic.

DISCUSSION

Postpartum spontaneous pneumomediastinum, known as Hamman's syndrome, after Louis Hamman, who first described this condition in 1945, is a rare complication of labour.¹ It has an estimated incidence of 1 in 100 000 deliveries.^{2–11}

Hamman's syndrome is commonly reported in young nulliparous women. Although the actual pathophysiological mechanism occurs in the second stage of labour, symptoms usually arise in the third or fourth stages. There is a proposed association with prolonged and difficult labour,³ although most case reports with postpartum pneumomediastinum did not have significant history of prolonged or difficult labour.

Typical presenting symptoms are sudden onset of retrosternal chest pain, dyspnoea, facial puffiness and swelling. Associated signs are tachycardia, neck crepitus and Hamman's sign. Hamman's sign is crackling noise synchronised with cardiac activity and best heard in the left lateral decubitus position during systole.⁴ It is usually considered as a pathognomonic of pneumomediastinum.

It is important to distinguish the symptoms of pneumomediastinum from similar medical conditions such as pulmonary embolus, dissecting aortic aneurysm, angina pectoris, cardiac tamponade and mediastinitis, as those conditions are serious and life threatening.

The pathophysiology of spontaneous pneumomediastinum explains the escape of air either from an oesophageal rupture or from lacerations of the tracheobronchial tree. In case of pneumomediastinum during labour, excessive intra-alveolar pressure leads to rupture of the distant alveoli, causing pulmonary interstitial emphysema. Ruptured peripheral alveoli can be provoked by forceful coughing associated with asthmatic bronchospasm, chest infection, illicit inhalational drug use and Valsalva manoeuvre. The gases subsequently travel along the perivascular connective tissue into the mediastinum.⁶ The air then spreads superiorly into visceral, retropharyngeal and subcutaneous spaces of the neck causing subcutaneous emphysema. Mediastinum air can also spread inferiorly into the retroperitoneal space and other extraperitoneal compartments.

Spontaneous postpartum pneumomediastinum is a potentially benign condition and self-limiting in nature when aggravating factors are no longer present, although potential life-threatening complications may occur.^{2–7} If mediastinal pressure rises abruptly, mediastinum parietal pleura may rupture, leading to spontaneous pneumothorax, which should be treated according to its severity.

It is important to recognise tension malignant pneumomediastinum; the extensive elevation of mediastinal pressure results in dyspnoea, cyanosis, jugular venous distension, and hypotension and shock. If it is not relieved surgically, it can lead to pulmonary oedema, circulatory failure and death. Mediastinitis is a potentially lethal complication with a high mortality rate, although it is usually only seen in spontaneous oesophageal perforation (Boerhaave's syndrome) and not reported in distal alveolar rupture.

Chest X-ray (both posteroanterior and lateral view) is the single most important test to confirm the diagnosis. Chest CT is required if the standard chest X-ray is not helpful. Normal chest X-ray cannot rule out the diagnosis of spontaneous pneumomediastinum. Arterial blood gas analysis can be carried out to detect the degree of hypoxia. ECG should be carried out to exclude the possible causes of chest pain. ECG is normal in the majority of spontaneous mediastinum cases, although 25% may demonstrate low voltage, T wave inversion or non-specific ST segment changes.¹⁰

Treatment is usually supportive with rest, reassurance and analgesia. Supplementary oxygen therapy may help in earlier absorption of air from the mediastinum and subcutaneous tissues. Symptoms usually resolve spontaneously within a few days, without any associated complications.

Recurrence in subsequent pregnancy is uncommon and there is no clear evidence of appropriate management in subsequent pregnancy. Some suggest the use of epidural analgesia to prevent active pushing, and avoidance of nitrous oxide, as it can increase the intra-alveolar pressure.

Learning points

- ▶ Postpartum pneumomediastinum should be considered in the differential diagnosis of sudden-onset postpartum chest pain immediately or a few hours after delivery.
- ▶ It is a rare benign condition and usually resolves spontaneously without serious consequences.
- ▶ Chest X-ray is the single most important diagnostic test; it is important to rule out other serious and life-threatening conditions.
- ▶ Prolonged pushing, difficult labour and use of inhalational drugs place young primiparous women at higher risk.
- ▶ Recurrence is uncommon in subsequent pregnancy, and management is unclear, although expectant management with epidural analgesia to prevent recurrence in subsequent pregnancy is suggested.

Competing interests None declared.

Patient consent Obtained.

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