Spontaneous pneumothorax in pregnancy and labour

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Summary

A case of spontaneous pneumothorax occurring at the end of labour in a healthy 17-year-old primigravida is described. Its occurrence was accompanied by marked surgical emphysema of the face, neck, arms and thorax. The patient had had previous thyroid surgery and was coincidentally found to have bilateral cervical ribs on chest X-ray.

Previously described cases are reviewed, and the management discussed. Hypoxia to the fetus is a definite threat, and spontaneous pneumothorax should be considered in the differential diagnosis of chest pain and dyspnoea during delivery. It is a potential extragenital cause of maternal mortality.

Introduction

Spontaneous pneumothorax is the sudden collapse of a lung, often without obvious cause, in an otherwise healthy person. It is a relatively common event in the general population, occurring most frequently in young males (5:1 ratio), but has not been reported often in pregnant women.

Case report

A 17-year-old fish cutter presented in February 1981 in false labour at 38 weeks of a normal first pregnancy. Her only significant past medical history was of a subtotal thyroidectomy for Graves' disease in 1977 at the age of 14; following operation she had remained well and euthyroid.

The day after admission she went into true labour. After artificial rupture of membranes she underwent a vaginal delivery with a strenuous second stage (stage 1, 13 hr; stage 2, 2 hr; stage 3, 10 min) and gave birth to a healthy male infant, weight 3300 g. Delivery was assisted by an intravenous oxytocin infusion and mediolateral episiotomy.

Ten minutes after the end of stage 3 she was returned to the recovery room. She was noted to have surgical emphysema over the whole of her face, neck,

upper arms and thorax, and was complaining of chest pain and shortness of breath. There was no clinical evidence of mediastinal shift and no suggestion of a tension pneumothorax. No systolic crunch could be heard on auscultation to indicate mediastinal emphysema (Hamman's sign). Chest X-ray taken immediately showed no evidence of pneumothorax, but again the lung fields were obscured radiologically by the surgical emphysema. Coincidentally, it was noted that she had bilateral cervical ribs. Her vital signs remained normal, and she was treated symptomatically.

Twenty-four hours after delivery the surgical emphysema was still clinically quite marked, but had resolved enough for a 30% left apical pneumothorax to be seen on repeat chest X-ray. She complained of chest pain intermittently for some days, and the surgical emphysema disappeared gradually over the next week. The left apical pneumothorax resolved slowly. By 10 days after delivery the left lung had completely re-expanded and the mother was well and fit for discharge. She has remained well since with no recurrence of the pneumothorax.

Review of the literature

There are twelve other cases of spontaneous pneumothorax in pregnancy previously described. Three of these patients had a history of chronic recurrent spontaneous pneumothoraces (Brantley, Del Valle and Schoenbuecher, 1961; Petrenko, 1962; Kurek, Zypper-Oledzka and Rzucidlo, 1969), and the association with pregnancy in these cases is probably fortuitous. In the latter two cases the pneumothorax occurred during labour. A number of patients had a history of chronic chest disease such as chronic bronchitis (Vance, 1968—in which the patient had episodes of bronchospasm during pregnancy) and asthma (Burgener and Solmes, 1979), histoplasmosis (Gass, Zeidberg and Hutcheson, 1957), and pulmonary tuberculosis (Hsu, Huang and Lin, 1959)—the last probably not being implicated in the aetiology of that patient's pneumothorax. The patient of Burgener & Solmes (1979) suffered no pneumothorax

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during labour. The second of two cases described by Kurek *et al.* (1969) was 2 hr after Caesarian section under general anaesthesia (presumably involving tracheal intubation and intermittent positive pressure ventilation), and as such should be considered an anaesthetic complication. It has not been included in the total. In other cases congenital cysts (Najafi and Guzman, 1977, 1978) or emphysematous blebs (Brantley *et al.*, 1961) have been found.

Davidova in 1972 described two teenage primigravids who had spontaneous pneumothoraces with histories identical to the case reported here in that they were noted to have surgical emphysema immediately after delivery, the pneumothorax also presumably being accompanied by pneumomediastinum. In the single case described by Najafi and Guzman, the exact relationship of the pneumothorax to labour is not made clear in either of two separate reports (1977, 1978). The patient apparently presented to her general practitioner 7 days post term with symptoms of a spontaneous pneumothorax, and was delivered on the following day (after tube insertion had been carried out). Rosiak & Barwiński (1973) report a patient whose spontaneous pneumothorax occurred in labour, whilst in the patient of Jonas (1964) it occurred 2 days before labour at term.

Discussion

Spontaneous pneumothorax is a relatively common event, and although occurring five times more often in young males it is not uncommon in young females. It is surprising, therefore, that it has rarely been documented in pregnant women, since its occurrence in pregnancy and especially during labour is a potentially serious threat to both the mother and fetus. When it does occur it constitutes an obstetric emergency.

The pneumothorax in the case described here became clinically apparent immediately after the completion of labour, and was associated with surgical emphysema. The presence of bilateral cervical ribs in this patient was presumably coincidental. Spontaneous pneumothorax has not been described as a more frequent complication in patients with cervical rib(s). The presence of a scar from previous thyroid surgery is also probably coincidental to the spread of the surgical emphysema, although it is interesting to note that one other patient who experienced a pneumothorax during delivery had also had a previous thyroidectomy (Kurek *et al.*, 1969).

Corkery (1970) described a case of surgical emphysema in labour, discussed the aetiology of ectopic gases and reviewed the incidence of surgical emphysema in labour. It is most common in the healthy primigravida in the course of a strenuous first or

second stage. Deep inspiration produces a large lung volume which is then compressed against a closed glottis during straining. At a critical point the parenchyma of the lung gives way and if the pressure continues the air from the alveolus tracks subpleurally or along the vessels into the mediastinum and then along the vessels of the trachea into the neck, thus giving rise to mediastinal emphysema, cutaneous surgical emphysema, spontaneous pneumothorax or a combination of all of these.

It may well be, therefore, that surgical emphysema appearing during parturition is not uncommonly associated with an accompanying underlying pneumothorax. Indeed, Sulavik (1975) states that pneumothorax develops in approximately one third of cases of spontaneous mediastinal emphysema, although he does not quote any references. However, three other reviewers of the subject state that an underlying pneumothorax never occurs (McCollum, 1940; Spellacy and Prem, 1963; Lam, 1967).

The management of acute spontaneous pneumothorax in pregnancy and labour should be along the lines of that occurring in any other patient. Tension pneumothorax requires immediate decompression, which may be life-saving (Vance, 1968). Otherwise, tube thoracotomy should be undertaken if the size, progression or associated factors demand it. A pneumothorax greater than 30% generally requires tube thoracotomy: smaller ones may re-expand spontaneously with conservative management. Failure of the lung to re-expand is usually due to the presence of congenital cysts or multiple blebs, in which case open thoracotomy may be required for excision and surgical pleurodesis (Brantley *et al.*, 1961; Najafi and Guzman, 1978).

Delivery should be expedited as quickly as possible when the pneumothorax occurs during labour itself. Caudal or epidural anaesthesia, episiotomy and low cavity forceps delivery has been the rule. In all cases discussed the baby has survived, and there are no cases yet described of maternal death in acute spontaneous pneumothorax occurring in labour, even when the pneumothorax has been the tension variety associated with profound cardiovascular collapse (Vance, 1968). It is a serious and potentially lethal occurrence both for the mother and fetus, however, and it is for this reason that a further case has been described and the previous cases reviewed in detail and their management discussed.

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