

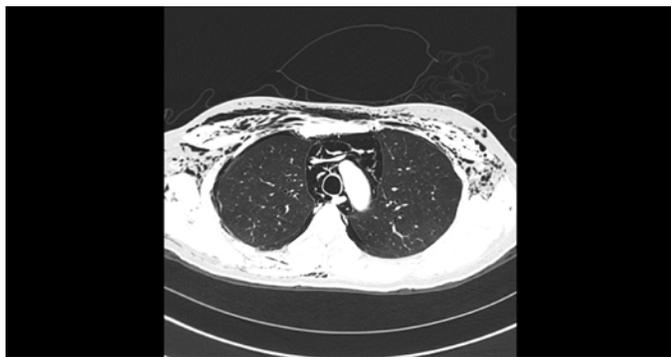
CLINICAL VIGNETTE

Special Delivery: Pneumomediastinum

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Case Presentation

A 33-year-old primiparous woman presented to the emergency department with chest pressure and shortness of breath. She had undergone a home birth with 4 hours of second stage labor prior to vaginal delivery of a healthy boy at 42 weeks gestation. Two hours into second stage labor, she began to experience shortness of breath and chest pressure that radiated to her neck and face. She also developed progressively worsening swelling of her anterior chest and face. An hour after delivery, the dyspnea and moderate chest pressure persisted, so she was brought to the ER. Her vital signs were unremarkable with an oxygen saturation of 98% on room air. Her breathing was non-labored. On exam, crepitus was noted in her chest and neck areas and she was also noted to have decreased breath and heart sounds. CT chest imaging demonstrated extensive subcutaneous emphysema, bilateral pneumothoraces, pneumomediastinum and pneumopericardium. During the three hours she was in the emergency department, her chest and neck swelling began to resolve, and her chest pressure and shortness of breath also improved. She was admitted for inpatient monitoring and placed on a non-rebreather mask with an oxygen flow rate of 15 liters per minute. Subsequent chest X-ray taken 12 hours after admission demonstrated resolving subcutaneous emphysema, pneumomediastinum, and pneumothoraces. She had complete resolution of her shortness of breath and chest pressure and was discharged the day after admission.



CT chest demonstrating pneumomediastinum, bilateral pneumothoraces, and subcutaneous emphysema

Discussion

Pneumomediastinum during labor is a rare complication during which an increase in intra-alveolar pressure caused by the Valsalva maneuver results in spontaneous alveolar rupture. The

air tracks to the mediastinum following vascular sheaths. If labor continues, air accumulating in the mediastinum can dissect along fascial planes into the neck musculature and subcutaneous tissues or follow the aorta and esophagus into the retropharyngeal space.¹

Pneumomediastinum during labor tends to occur in younger, primiparous women with term or longer duration pregnancies.² It usually occurs during the second stage of labor, though it has been described as occurring in the first stage of labor.³ The incidence is estimated to be 1 in 100,000 deliveries.⁴

Presenting symptoms are typically dyspnea, chest pain, or subcutaneous emphysema.¹ Atypical presentations of hearing loss and facial asymmetry have also been described.^{5,6} The presence of pneumomediastinum can be confirmed radiographically, typically by chest X-ray. If pneumomediastinum is confirmed, esophageal rupture as a source of pneumomediastinum should be considered, which is a life-threatening complication. There are three reported cases of pneumomediastinum during labor due to esophageal rupture. Two of the three cases vomited during labor, which may have contributed to esophageal perforation. All three had presumed esophageal perforation based on chest X-ray finding of pneumomediastinum without pneumothorax. Two of the cases had gastrografin swallow studies which revealed no leak, but esophageal perforation was subsequently confirmed by endoscopy in one of the cases. All three cases were treated conservatively with antibiotics and cessation of oral intake with resolution of pneumomediastinum, dyspnea, and chest pain.⁷⁻⁹

The disease course of labor induced pneumomediastinum is typically benign.² Management is usually supportive with analgesics for chest pain and supplemental oxygen to increase the gas resorption rate.^{4,10} Recurrence in subsequent pregnancies is unlikely.⁴

Conclusion

Pneumomediastinum is a rare complication that typically occurs during the second stage of labor in primigravid women. Pneumomediastinum is confirmed with radiographic imaging. Esophageal rupture as a cause of pneumomediastinum should be suspected if the patient has vomited with no radiographic evidence of pneumothorax. The prognosis of pneumomediastinum during labor is favorable and should be managed with

analgesics and supplemental oxygen. Recurrence is not expected with future pregnancies.

REFERENCES

1. **Bell AM.** Mediastinal emphysema following labour. *Can Med Assoc J.* 1952 Oct;67(4):362. PubMed PMID: 13009565; PubMed Central PMCID: PMC1822580.
2. **Amine NO, Lomiguen CM, Iftikhar A, Sahni S.** Pregnancy-associated Spontaneous Pneumomediastinum: A Contemporary Review. *Cureus.* 2018 Oct 15;10(10):e3452. doi: 10.7759/cureus.3452. Review. PubMed PMID: 30564531; PubMed Central PMCID: PMC6298626.
3. **Miller HJ.** Mediastinal and subcutaneous emphysema during the first stage of labor. *South Med J.* 1969 Aug;62(8):1007 passim. PubMed PMID: 5798320.
4. **Majer S, Graber P.** Postpartum pneumomediastinum (Hamman's syndrome). *CMAJ.* 2007 Jul 3;177(1):32. PubMed PMID: 17606935; PubMed Central PMCID: PMC1896037.
5. **Dilley JW.** Postpartum hearing loss: an unusual presentation of Hamman's syndrome. *J Obstet Gynaecol.* 2011;31(3):268-9. doi: 10.3109/01443615.2011.552745. PubMed PMID: 21417661.
6. **Wijesuriya J, Van Hoogstraten R.** Postpartum Hamman's syndrome presenting with facial asymmetry. *BMJ Case Rep.* 2015 Dec 30;2015. pii: bcr2015213397. doi: 10.1136/bcr-2015-213397. PubMed PMID: 26718708; PubMed Central PMCID: PMC4716269.
7. **Whelan S, Kelly M.** Pneumomediastinum following a prolonged second stage of labor - an emphasis on early diagnosis and conservative management: a case report. *J Med Case Rep.* 2017 Nov 6;11(1):313. doi: 10.1186/s13256-017-1482-1. PubMed PMID: 29110705; PubMed Central PMCID: PMC5674236.
8. **Dresner SM, Bailey JL, Lamb PJ, Wayman J, Griffin SM.** Spontaneous oesophageal perforation during vaginal delivery. *J R Soc Med.* 2001 Feb;94(2):90-1. PubMed PMID: 11234211; PubMed Central PMCID: PMC1297918.
9. **Hamilton S, Nicholson SC, Beattie GJ.** Spontaneous oesophageal rupture in the second stage of labour. *J Obstet Gynaecol.* 2003 Nov;23(6):668-9. PubMed PMID: 14617478.
10. **Northfield TC.** Oxygen therapy for spontaneous pneumothorax. *Br Med J.* 1971 Oct 9;4(5779):86-8. PubMed PMID: 4938315; PubMed Central PMCID: PMC1799310.