

# Case Reports and Review of Literature: Pneumomediastinum Associated with Hyperemesis Gravidarum

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## Background

Pneumomediastinum is a rare complication of hyperemesis gravidarum. The incidence of pregnancy-related pneumomediastinum is only 1:100,000<sup>2</sup>, with most of these cases occurring during labor<sup>2,10</sup>. There are only 10 published cases of pneumomediastinum associated with hyperemesis gravidarum on PubMed.

## Case 1

24 y/o Gravida 1 Para 0

8w2d – 9w4d: 2 ER visits and 1 hospitalization

**9w4d:** Presented to ER again w/ nausea, vomiting, and chest pain. Objective findings: Tachycardia, leukocytosis, hypokalemia, 22 lb weight loss from initial presentation. CTA negative for pulmonary embolus, however, showed pneumomediastinum, esophageal thickening, and concern for small perforation at upper esophagus. Transvaginal ultrasound showed missed abortion.

**Day 1:** Per General Surgery, patient admitted to ICU, started on IV fluids, broad-spectrum antibiotics and antifungal. Gastrografin esophagram limited, thus CT chest w/o contrast obtained showing small esophageal tear at level of T4.

**Day 2:** OB/GYN performed dilation and curettage for missed abortion.

**Day 4:** Repeat esophagram w/ barium contrast obtained showing mild stricture formation and edema from resolving tear, no contrast extravasation. General Surgery recommended clear liquid diet immediately to be advanced as tolerated and confirmatory EGD in 6 wks. IV antibiotics and antifungal discontinued, patient downgraded to med-surg floor.

**Day 9:** Discharged after nausea and vomiting controlled. EGD records unattainable.

## Case 2

20 y/o Gravida 1 Para 0

8w0d – 10w5d: 4 ER visits and 1 hospitalization

**10w5d:** Presented to ER with nausea, vomiting, chest pain, and subcutaneous emphysema extending from chest to face. Objective findings: tachycardia, hypertension, leukocytosis, hyponatremia, hypokalemia, hypochloremia, transaminitis, elevated lactate, and 20 lb weight loss over 12 days. CXR showed pneumomediastinum and chest wall emphysema (fig. 1). CT chest and neck showed massive pneumomediastinum, pneumopericardium, and large volume chest wall emphysema extending to neck and face (fig. 2). EKG with tachycardia and right axis deviation, otherwise normal.

**Day 1:** Per General Surgery, patient admitted to ICU and started on IV fluids and broad-spectrum antibiotics. Gastrografin esophagram negative for evidence of esophageal rupture, thus General Surgery signed off.

**Day 5:** Slow improvement of subcutaneous emphysema, however continued nausea, vomiting, and electrolyte derangements despite treatment. Following shared decision making with OB/GYN, dilation and curettage performed for termination of pregnancy.

**Day 6:** Discharged after nausea and vomiting resolved. Lost to follow up.

## Figures

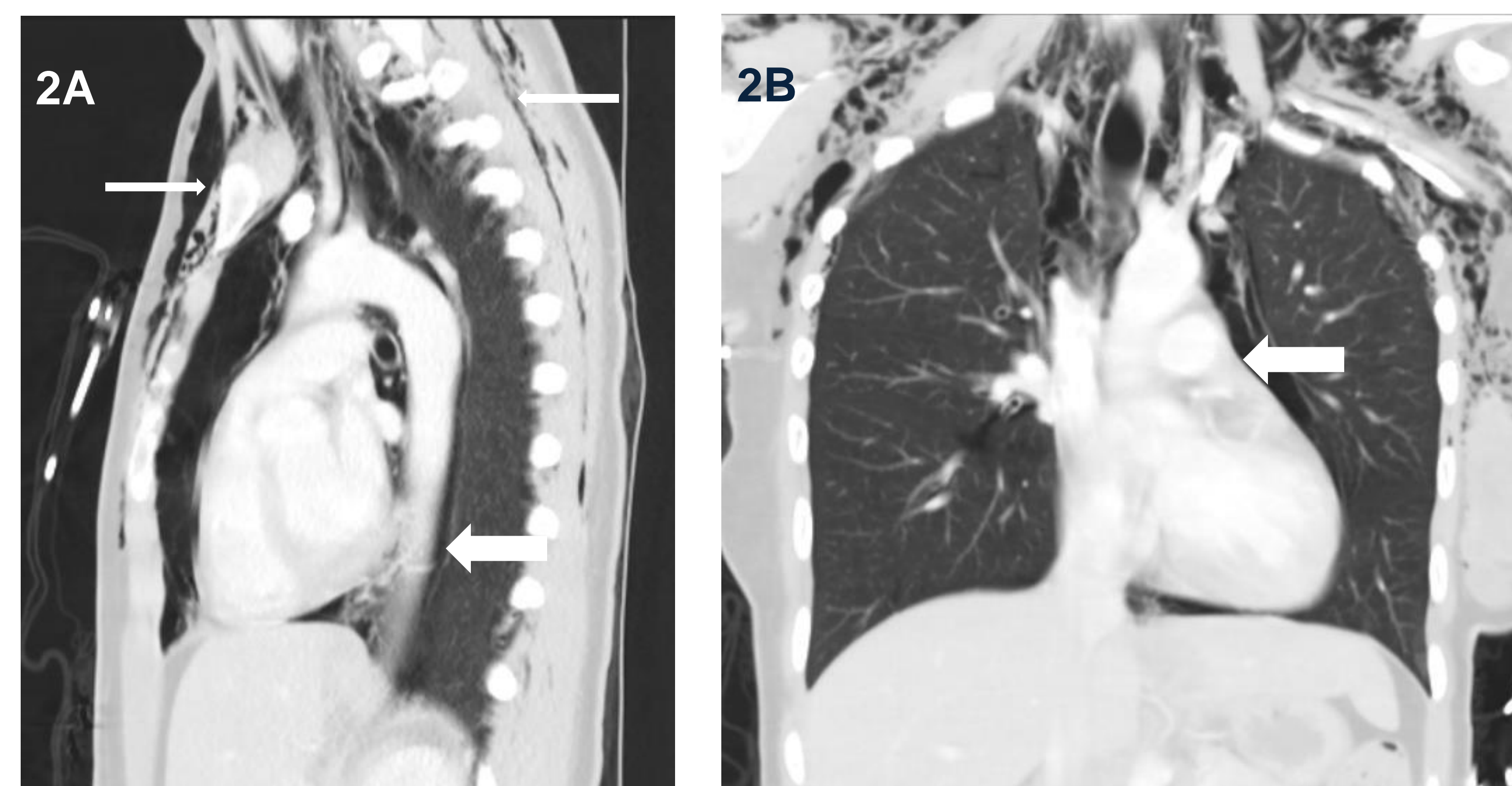
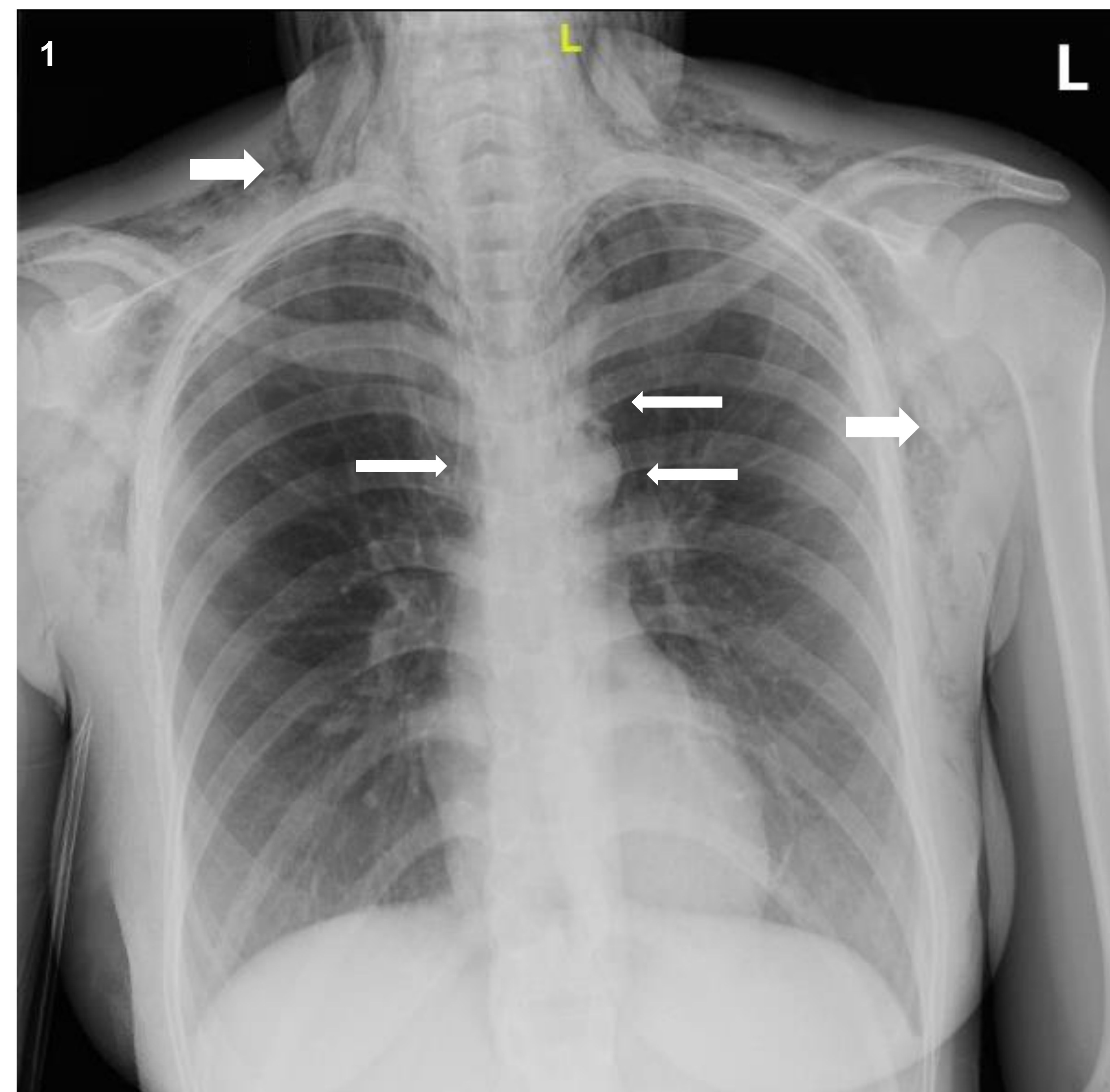


Figure 1. Thick arrows indicate subcutaneous emphysema. Thin arrows delineate pneumomediastinum.

Figure 2A. Thick arrow presents air in posterior mediastinum. Thin arrows indicate extent of subcutaneous emphysema.

Figure 2B. Thick arrow identifies pneumopericardium.

*This research was supported (in whole or in part) by HCA Healthcare and/or an HCA Healthcare affiliated entity. The views expressed in this publication represent those of the author(s) and do not necessarily represent the official views of HCA Healthcare or any of its affiliated entities.*

## Discussion

There are 2 modes by which pneumomediastinum can result from hyperemesis, including **spontaneous alveolar rupture** and **esophageal rupture**. Both etiologies present similarly, however, spontaneous alveolar rupture is more common, typically self-limiting, and can be treated symptomatically. Esophageal rupture can lead to significant morbidity and mortality, and may require surgical intervention<sup>1-7</sup>. Thus, it is important to distinguish etiology in a timely manner to ensure appropriate intervention.

Most patients will likely receive an initial EKG at presentation. About 25% of patients may demonstrate the following changes on an EKG: low voltage, change in axis, T-wave inversion, or nonspecific ST segment changes<sup>7</sup>. **The primary imaging modality is chest x-ray.** If pneumomediastinum is suspected but not apparent on the PA view, a lateral chest x-ray should be obtained. Up to 50% of cases of pneumomediastinum may be missed on the standard PA view<sup>7</sup>. **Esophageal tear must then be ruled out with a contrast esophagram. Detection of the rupture within 24 hours of onset allows a survival of 80% or greater<sup>5-8</sup>.**

Spontaneous alveolar rupture can be treated with oxygen, antiemetics, and analgesia as needed. If pneumomediastinum is due to esophageal rupture, initial treatment should involve fluid resuscitation, broad-spectrum IV antibiotics, and immediate surgical consultation<sup>4</sup>. There are no clear guidelines or recommendations on when termination of pregnancy should be considered.

## Teaching Points

1. Intractable nausea and vomiting of early pregnancy associated with non-resolving chest pain should raise suspicion for pneumomediastinum.
2. Chest X-ray is the primary diagnostic imaging modality for pneumomediastinum.
3. When pneumomediastinum is confirmed, a contrast esophagram should be obtained to rule out esophageal rupture.
4. Uncomplicated spontaneous alveolar rupture can be managed conservatively whereas esophageal rupture may require surgery. Ultimate treatment may or may not necessitate termination of pregnancy.

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