

Unanticipated Respiratory Distress During Recovery with Incidental Airway Finding

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Learning Objective

Unanticipated respiratory complications during the postoperative period are rare but potentially fatal sequelae of anesthesia. Anesthesia providers must remain vigilant to diagnose and manage these complications.

Case Presentation

A 66-year-old female presented to the emergency department with sore throat, shortness of breath, and epigastric pain. Her medical history includes hypertension, breast cancer (treated with lumpectomy and radiotherapy), and cervical cancer (post-hysterectomy). She had COVID-19 one week prior and history of COVID pneumonia complicated by elevated troponin two years prior. Medications include atorvastatin and lisinopril-HCTZ. Diagnostic tests revealed biliary colic on ultrasound and normal chest X-ray. The patient was scheduled for laparoscopic cholecystectomy.

She had a smooth anesthetic induction and intubation despite a Mallampati II airway, short thyromental distance, and Grade IIb Cormack-Lehane upon laryngoscopy. However, she required multiple re-intubations post-operatively due to unexpected respiratory distress.

Subsequent evaluation revealed massively enlarged and nodular thyroid glands, peri-glottic edema, and tracheal deviation necessitating hemithyroidectomy and creation of tracheostomy. This case underscores the importance of thorough pre-operative assessment in identifying and managing anatomical and physiological findings that could impact surgical and/or anesthetic outcomes. Despite our best efforts to evaluate the patient's airway, the provider must remain vigilant in the postoperative period to diagnose and manage unanticipated respiratory distress.

Hospital Timeline

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| <ul style="list-style-type: none">• 9 days prior to presentation<ul style="list-style-type: none">○ Positive for Covid-19• Presentation<ul style="list-style-type: none">○ Presented to ED with abdominal pain• Day of surgery<ul style="list-style-type: none">○ Anesthesia start at 1234 for laparoscopic cholecystectomy and cholangiogram○ Atraumatic intubation at 1241 (Grade IIb view, MAC 3 blade, direct laryngoscopy, 7.0mm ETT)○ Uneventful extubation at 1623○ PACU handoff at 1636○ Hydromorphone 0.5mg IV administered at 1656, 1719, 1738○ Pt asleep around 1745○ Pt woke up around 1759 and reported difficulty breathing (O2 saturation (97% or high on 2L NC)○ Pt started to desaturate into the 60s% around 1602○ Pt intubated around 1615 (Grade III view, MAC 3 blade, direct laryngoscopy, 7.0mm ETT)○ Pt transferred to SICU• POD1<ul style="list-style-type: none">○ Failed leak test around 1230-1300○ Pt extubated around 1335 to 30L 30% HFNC○ Difficulty breathing, inspiratory stridor noted, racemic epinephrine given without resolution | <ul style="list-style-type: none">• POD1 continued<ul style="list-style-type: none">○ Desaturation to 40%○ Intubated by anesthesia around 1403 (Grade III view, MAC 3 blade, Glidescope video laryngoscopy, 6.5mm ETT)○ CT scan at 1951 shows "diffusely enlarged gland, including the thyroid isthmus. (Each lobe measures approximately 7cm (height) x 4.5 (AP distance) x 4cm (width). The carotid artery and jugular veins are displaced laterally."<ul style="list-style-type: none">▪ Normal thyroid lobe 4-4.8 by 1-1.8 by 0.8-1.6cm^{4,5}• POD4<ul style="list-style-type: none">○ ENT discussed with pt and family the need for tracheostomy and bilateral vs unilateral thyroidectomy. Pt elected for tracheostomy and right hemithyroidectomy.○ Ultrasound shows volumes of 73mL and 60.2mL for right and left lobes, respectively<ul style="list-style-type: none">▪ Up to 40% tracheal narrowing has been shown at 30.29mL³• POD6<ul style="list-style-type: none">○ Pt underwent above procedure without complication• POD7-17<ul style="list-style-type: none">○ Development of MRSA+ pneumonia and recovery• POD18<ul style="list-style-type: none">○ Discharged home |
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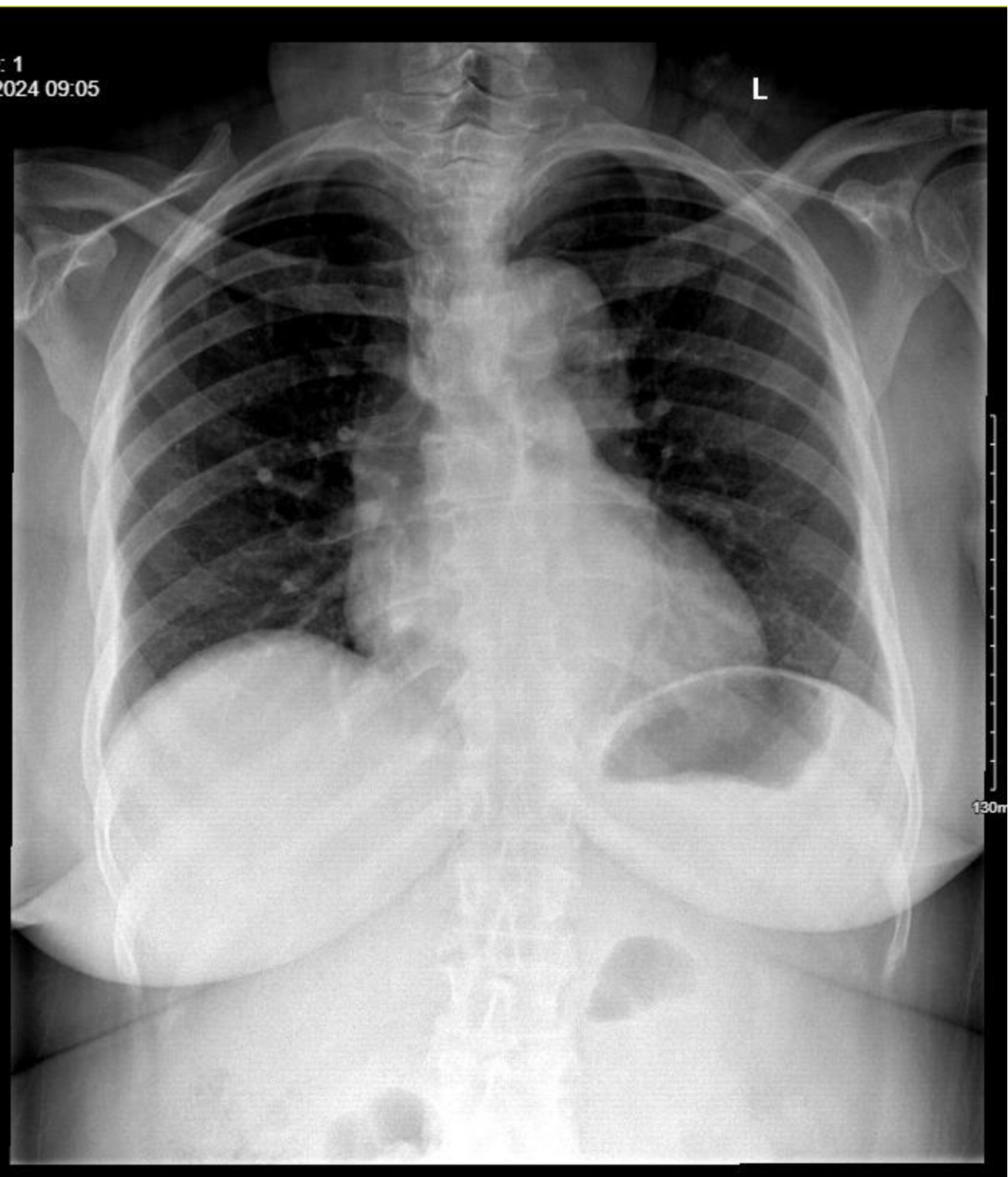


Figure 1. Preoperative chest radiograph showing tracheal deviation



Figure 2. Axial view of thyroid CT scan showing markedly enlarged thyroid glands and isthmus



Figure 3. Coronal view of thyroid CT scan showing markedly enlarged thyroid glands and isthmus

Discussion

Unplanned postoperative reintubation is uncommon, occurring in 0.4%-4% of cases, yet it significantly increases morbidity and mortality rates for patients¹.

The patient had predisposing factors such as recent Covid-19 infection, potentially inducing a pro-inflammatory state. Anatomical factors that may have contributed to post-operative respiratory distress were a thick neck, tracheal deviation, short thyromental distance, obesity, and a large tongue, suggesting the possibility of undiagnosed obstructive sleep apnea.

Provider experience likely influenced both initial and subsequent reintubations. A more experienced provider might have minimized trauma during the initial intubation. Inexperience in post-operative pain management led to a suspected narcosis, possibly contributing to the first reintubation².

The mode of laryngoscopy, direct instead of video, may have contributed to a more traumatic initial reintubation during less than ideal intubating conditions. Video laryngoscopy was needed for the challenging conditions of the second reintubation.

Lastly, the unexpectedly enlarged goiter might have potentially contributed to post-operative hypoxia, in combination with upper airway edema and pharyngeal collapse due to traumatic intubation and patient anatomy, though goiters typically do not cause airway compression.³

References

1. Acheampong D, Guerrier S, Lavarias V, et al. Unplanned postoperative reintubation following general and vascular surgical procedures: Outcomes and risk factors. *Annals of Medicine and Surgery*. 2018;33:40-43. doi:10.1016/j.amsu.2018.08.013
2. Weingarten TN, Sprung J. Review of Postoperative Respiratory Depression: From Recovery Room to General Care Unit. *Anesthesiology*. 2022;137(6):735-741. doi:10.1097/aln.0000000000004391
3. Binar M, Serindere M, Bozlar U, et al. Determining the thyroid gland volume causing tracheal compression: A semiautomated 3D CT volumetry study. *Medicina*. 2019;55(5):143. doi:10.3390/medicina55050143
4. Berghout A, Wiersinga WM, Smits NJ, Touber JL. Determinants of thyroid volume as measured by ultrasonography in healthy adults in a non-iodine deficient area. *Clinical Endocrinology*. 1987;26(3):273-280. doi:10.1111/j.1365-2265.1987.tb00784.x
5. Maravall FJ, Gómez-Arnáiz N, Gumá A, Abós R, Soler J, Gómez JM. Reference values of thyroid volume in a healthy, non-iodine-deficient Spanish population. *Hormone and Metabolic Research*. 2004;36(9):645-649. doi:10.1055/s-2004-825901