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Case Report

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Subcutaneous Emphysema Following Laser Assisted Dilation of Subglottic Stenosis: A Case Report

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ABSTRACT

Introduction: Subcutaneous emphysema is characterized by the accumulation of air beneath the dermal layers of the skin. We present a case of extensive subcutaneous emphysema of the neck, face and arms in a patient who was two days post operative from laser assisted dilation of subglottic stenosis.

Materials and Methods: We present a case of subcutaneous emphysema in a patient who presented to the emergency department. As this is a case report, no additional materials or specific methods were required.

Case Presentation: A 71-year-old man with history of tracheal stenosis status post laser assisted subglottic dilation presented to the emergency department two days post-operatively for progressively worsening swelling of the face, neck and arms. Physical exam was notable for crepitus of the face, neck and arms. Oropharyngeal exam showed no edema to the posterior oropharynx or tongue. Breathing was non-labored without stridor. Imaging revealed extensive subcutaneous emphysema without any obvious source. The otolaryngology (ENT) service evaluated the patient and admitted him to their service. Initially he was managed conservatively via observation and supportive care however, on day two of hospitalization his respiratory status worsened. He required intubation and tracheal stent placement. The tracheal defect was never found on exploration in the operating room, suggesting the defect was sub-centimeter in size. He was extubated on hospital day four and discharged with a plan to have the tracheal stent in place for three months.

Conclusion: Subcutaneous emphysema secondary to a tracheobronchial tree defect is a known complication of laser dilatation of subglottic stenosis. Most cases resolve spontaneously and can be managed conservatively. However, patients require close airway monitoring as some may require emergent airway management. Clinicians should be aware of this complication and subsequent management.

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Keywords: Subcutaneous Emphysema, Laser Assisted Dilation of Subglottic Stenosis, Airway Emergencies, Otolaryngology Emergencies

Results/Observations

Case Presentation

A 71-year-old man with history of tracheal stenosis who had recently undergone laser assisted subglottic dilation presented to the emergency department two days post-operatively for progressively worsening swelling of the face, neck, and eyes (Figure 1).

The patient was initially concerned that they were having an allergic reaction to the acetaminophen or codeine they had been taking following the procedure, though they had previously taken these medications without any adverse effects. Physical examination revealed significant facial, neck, and infraorbital crepitus that was also noted over the upper extremities. There was no swelling of the lips and oropharyngeal exam showed no edema to the posterior oropharynx or tongue. Lungs were clear and breathing was non labored without any notable stridor. There was no chest or abdominal distension or crepitus. Chest X-ray and Maxillofacial and Neck Soft Tissue CT demonstrated extensive subcutaneous emphysema of the chest, upper face, and neck (Figures 2 & 3).

Figure 1: Facial and Neck Swelling in a Patient with Subcutaneous Emphysema

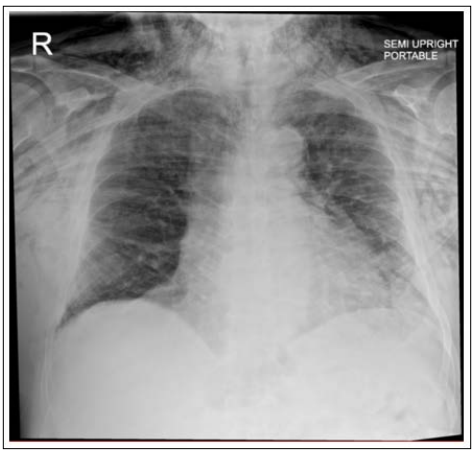

Figure 2: Chest X-ray Demonstrating Substantial Emphysema and Pneumomediastinum

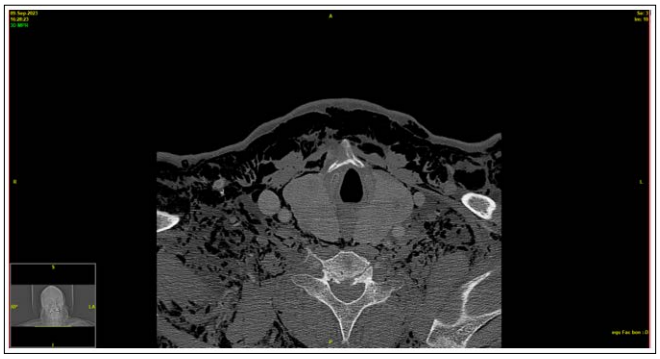

Figure 3: Neck CT Demonstrating Emphysema in Superficial and Deep Subcutaneous Soft Tissues

The otolaryngology service was consulted, and the patient was ultimately admitted to their service for monitoring. Initially he was managed conservatively via observation and supportive care however, on day two of hospitalization his respiratory status worsened and was subsequently intubated and had a tracheal sent placed by the ENT service. The tracheal defect was never found on exploration in the operating room suggesting the defect itself to be sub-centimeter in size. Patient was ultimately extubated on hospital day four and was eventually discharged with a plan to have the tracheal stent in place for three months.

Discussion

Subcutaneous emphysema is characterized by the accumulation of air beneath the dermal layers of the skin. This is primarily due to injury to the respiratory or gastrointestinal tract that allows for the passage of air into the subcutaneous tissues. The mechanism of the injury can be from a variety of etiologies, including blunt or penetrating trauma, surgical or other iatrogenic perforation, and spontaneous extravasation of inspired air, such as through injured pleural tissue in a pneumothorax [1]. Patients typically present with concerns of facial and neck swelling. The most common physical exam finding is crepitus on palpation of the affected areas, and diagnosis can be confirmed with X ray and CT imaging [2]. We postulate that the subcutaneous emphysema in our patient was the result of an occult tracheal injury sustained during the laser assisted dilation he underwent for his subglottic stenosis.

Therapeutic goals are focused on preventing complications, while also repairing the point of air entry if it can be identified and is too large to heal spontaneously. Complications include infection, prevention of thoracic wall expansion, and compartment syndrome [3]. Air extension into the thoracic cavity and neck can lead to airway compression and cardiopulmonary compromise, while compartment syndrome could progress to tissue necrosis if not addressed rapidly [2,3]. Empiric antibiotics can be given prophylactically to prevent mediastinitis, and supplemental oxygen may help facilitate the body's resorption of air [2,3]. Surgical management to repair the defect in the trachea can be considered if conservative management ultimately fails. Given the patient's risks for complications from the subcutaneous emphysema, he was admitted to ENT for further monitoring and treatment. While prognosis is dependent on the extent of air infiltration and the ability to manage any complications, the majority of subcutaneous emphysema cases are self-limited and improve with supportive care [4].

Conflicts of Interest/Support

There Are No Conflicts of Interest for Any of The Authors or Outside Sources of Financial Support.

References

1. Aghajanzadeh M, Dehnadi A, Ebrahimi H, Fallah Karkan M, Khajeh Jahromi S, et al. (2015) Classification and management of subcutaneous emphysema: a 10-year experience. Indian J Surg 77: 673-677.
2. McKenzie WS, Rosenberg M (2009) Iatrogenic subcutaneous emphysema of dental and surgical origin: a literature review. J Oral Maxillofac Surg 67: 1265-1268.
3. Melhorn J, Davies HE (2021) The management of subcutaneous emphysema in pneumothorax: a literature review. Curr Pulmonol Rep 10: 92-97.
4. Jones E, Gould A, Pillay TD, Khorasanee R, Sykes R, et al. (2020) Subcutaneous emphysema, pneumomediastinum, and pneumothorax in critically ill patients with coronavirus disease 2019: a retrospective cohort study. Crit Care Explor 2: e0210.