



Case Report

An unusual case of surgical emphysema of neck due to compression injury: A case report

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ABSTRACT

Neck trauma due to compressing injury (accompanied by surgical emphysema and pneumomediastinum) can be critical. It may develop in up to 10% of patients and may be a significant cause of morbidity and mortality due to the associated damage to the aerodigestive tract. Depending on the extent and severity of aerodigestive tract injury, management varies between conservative to surgical intervention. We present a case of blunt compressing neck trauma accompanied by subcutaneous emphysema secondary to compression of the neck by a cloth around the neck pulled by entangling in the shaft of a running electrical motor. It resulted in a leak in the oropharyngeal region which caused surgical emphysema in the cervicofacial region and pneumomediastinum. Its radiologic appearance, clinical presentation, and initial management options in the emergency department (ED) are presented here.

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1. Introduction

Blunt trauma to the neck typically result from motor vehicle crashes (dashboard syndrome), with bicycle accidents (neck striking the handlebars), falls (neck striking an object) and sports-related injuries (e.g., minibike, snowmobile, water jet ski, clothesline tackle).¹ Strong pull on woollen cloth (Muffler) around the neck can compress the neck and result in an injury resulting in surgical emphysema. Impact to the exposed anterior aspect of the neck may crush the larynx or the trachea, particularly at the cricoid ring, and compress the oesophagus against the posterior spinal column. The air ascends along the mediastinum toward the subcutaneous space of the neck, causing cervicofacial subcutaneous emphysema.² Pneumomediastinum following cervicofacial emphysema has a benign aetiology, caused by an extension of a pneumothorax through a pleural tear and air dissection around the bronchovascular sheath (the Macklin effect) or micro-perforations that are not clinically apparent.³ Cervicofacial emphysema and

pneumomediastinum are rarely observed and have been reported related to dental surgical procedures, sequelae of surgical intervention in the upper aerodigestive tract orofacial trauma.⁴⁻⁶ They may cause a potentially life-threatening condition, but most cases are self-limiting and benign. Symptoms include chest pain, neck pain, dyspnea and pain with swallowing (odynophagia).⁵ Management of this condition varies from a conservative approach with close observation in the intensive care unit (ICU) and antibiotic therapy to laryngotracheal or oesophageal reconstruction depending on the patient's hemodynamic status, the clinical evidence and severity of aerodigestive injuries.^{7,8} A case with subcutaneous emphysema occurred after compression of the neck by encircling woollen cloth (Muffler) wrapped around the neck to protect from cold weather. This muffler got entangled in the running electrical motor's shaft and resulted in a compression neck injury. CECT showed a small leak in the oropharyngeal region resulting in cervicofacial and mediastinal emphysema. This paper highlights this unusual condition and its radiologic appearance, clinical presentation, and the options for initial

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management in the emergency department

2. Case Report

A young man presented in the emergency department with an encircling scar mark around the neck with cervicofacial surgical emphysema (Figure 1). On Examination, blood pressure, pulse and respiration were normal. The patient was admitted to ICU and was put on humidified oxygen, I/V fluids and broad-spectrum antibiotics. Posteroanterior and lateral chest X-ray showed subcutaneous as well as pneumomediastinum (Figures 2 and 3). CT scan confirmed the oropharyngeal leak (Figure 4). The patient was managed conservatively and was discharged after 10 days without any complication



Fig. 1: Patient photo showing injury on the neck along with cervical surgical emphysema.

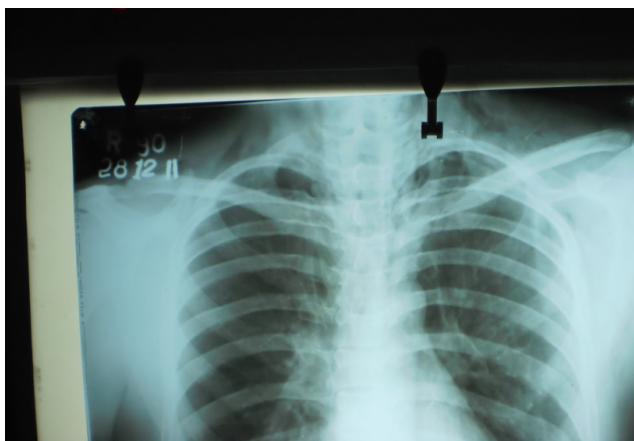


Fig. 2: Posteroanterior view of chest X-ray shows surgical emphysema neck

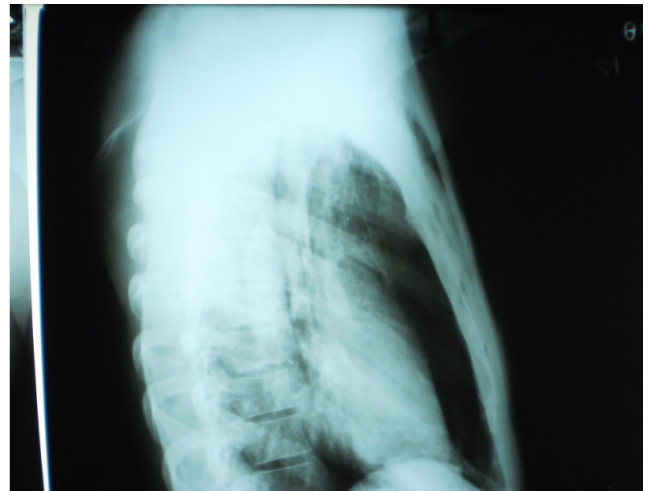


Fig. 3: Lateral view of Chest X-ray showing pneumomediastinum

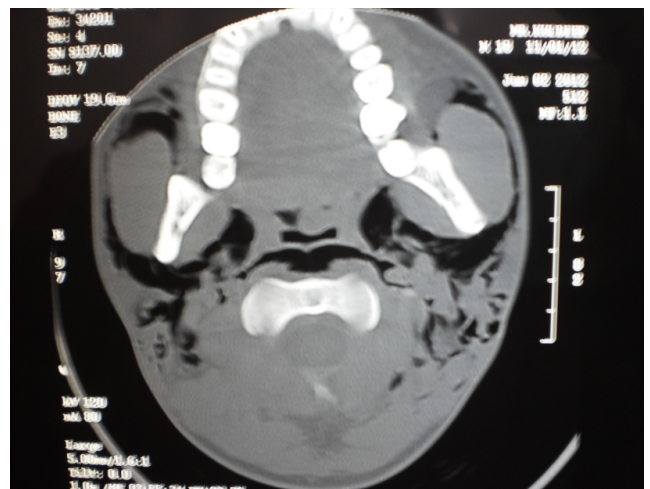


Fig. 4: CECT showing emphysema

3. Discussion

Blunt trauma to the neck can result in a wide range of injuries to the oropharynx, larynx or trachea. Injuries to other structures in the neck include the cervical spine, oesophagus, vascular, and nerve.^{1,9} Tracheobronchial injury, a rare but potentially fatal condition, results from blunt or penetrating chest or neck trauma and has different clinical signs.² Compression blunt neck trauma resulting in oropharyngeal leak with subcutaneous emphysema is quite rare. These include signs of soft tissue injury (e.g., redness, ecchymosis, swelling, tenderness) to the anterior neck, subcutaneous emphysema, pneumomediastinum (as in our case) or deformity of thyroid, cartilage.^{2,9} Even though pneumomediastinum and subcutaneous emphysema following severe blunt thoracic or cervical trauma is often considered an indicator of serious aerodigestive injury, a

major aerodigestive tract injury is seen in approximately 7% of patients with blunt trauma pneumomediastinum.⁸ Radiographic and endoscopic studies are recommended to evaluate patients for aerodigestive injuries.⁹ Posteroanterior and lateral radiographs are usually helpful for diagnosing pneumomediastinum, as Posteroanterior chest radiographs typically demonstrate a radiolucent line between the left heart border and the mediastinal pleura.¹⁰ However, radiographic imaging may not be as accurate in assessing the severity and extent of the injury. CT scan is great accessibility in identifying patients with a high likelihood of serious aerodigestive tract injury and visualizing the rupture level and its consequences concerning the pulmonary parenchyma.^{4,7}

In the present case, the initial physical Examination showed important cervicofacial and thoracic subcutaneous emphysema. The chest radiograph and thoracic CT confirmed these clinical findings and revealed the presence of pneumomediastinum. Complementary diagnostic procedures hence recommend (micro laryngoscopy, bronchoscopy, esophagoscopy), are often performed for the evaluation of all pneumomediastinum patients to exclude a major aerodigestive tract injury.^{8,10} However, if the patient is stable clinically, then these invasive procedures is contentious.¹⁰ The clinical significance of isolated pneumomediastinum in the stable blunt trauma patient remains indistinct. This leads to significant challenges in managing the case in which pneumomediastinum may represent a precursor of severe thoracic injury.^{8,10} In the present case, there was no clinical evidence of aerodigestive injury (e.g., dyspnoea, chest pain, shortness of breath), so further diagnostic testing was not necessary for determining the presence of aerodigestive injury.

It is the extent and severity of aerodigestive injuries and not the pneumomediastinum presence, which determines the definitive treatment of blunt neck trauma patients. In haemodynamically stable patients without any signs of aerodigestive tract injury, conservative management consisting of humidified oxygen and antibiotic has been recommended.⁸ Usually, pneumomediastinum without pneumothorax can be managed conservatively; however, tracheotomy and tube thoracostomy is needed if massive pneumomediastinum and pneumothorax develop.¹⁰ In tracheobronchial injuries, tracheostomy or primary repair of the injury with possible stenting is required.^{1–8}

4. Conclusion

In conclusion, a haemodynamically stable patient without major aerodigestive injuries can be managed in ICU without

invasive testing. CT scan is of great value in deciding which patients can be observed safely and who will need further evaluation for pneumomediastinum.

5. Source of Funding

None.

6. Conflict of Interest

None.

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