A Rare Presentation of Subcutaneous Emphysema Secondary to Blunt Trauma Chest

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Abstract: Subcutaneous emphysema is the de novo generation or infiltration of air underneath the dermal layers of skin. The development of subcutaneous air may be a benign symptom or an indication of a deeper, more concerning pathologic disease state (1). The most common and visible sign and symptom of SE is swelling around the neck accompanied with pain in the chest. Other signs and symptoms include tender sore throat, aching neck, difficulty in swallowing, breathlessness, wheezing, and distension. So, it often causes minimal symptoms, is not dangerous in itself, and requires no specific treatment ⁽²⁾. We classify the severity of SE based on anatomical extension into five grades including the (1) base of the neck, (2) all of the neck area, (3) subpectoralis major area, (4) chest wall and all of the neck area, and (5) chest wall, neck, orbit, scalp, abdominal wall, upper limbs, and scrotum (2). Tracheal rupture is a rare but life threatening complication that most commonly occurs after blunt trauma of the neck and chest. Iatrogenic rupture is extremely rare and can occur after intubation, bronchoscopy, or esophagectomy ^{(3).} Recently spontaneous tension pneumomediastinum (PTM), pneumothorax (PT), and subcutaneous emphysema (SE) were reported as infrequent complications in COVID - 19 patients. Early diagnosis and treatment could save the patients since these complications are related to poor prognosis and prolonged hospitalization ⁽⁴⁾. Air expansion can involve subcutaneous and deep tissues, with the non - extensive subcutaneous spread being less concerning for clinical deterioration. However, the development of subcutaneous emphysema may indicate that air is occupying another deeper area within the body not visible to the unaided eye. Air extravasation in other body cavities and spaces can cause pneumomediastinum, pneumoperitoneum, pneumoretroperitoneum, and pneumothorax. Subcutaneous emphysema is a rare complication of acute severe asthma that may occur in association with spontaneous pneumomediastinum, pneumopericardium or pneumoperitoneum. Spontaneous pneumomediastinum arises as a result of sudden rise in intra - alveolar pressure (asthma, vasalva manouvre, cough, emesis, barotraumas) resulting in the rupture of marginal alveoli and subsequent tracking of air along bronchi, interstitial and vascular support tissues into the mediastinum ^{(5).}

Keywords: Subcutaneous emphysema, Blunt trauma, Chest trauma, Strangulation

1. Blinder Main Text

A 34 - year - old female, housewife, presented to the hospital after accidentally getting her neck whorled around a scarf which she was wearing while selling sugarcane juice with complaints of neck pain and swelling around her neck. There was no history of seizures/ altered mental sensorium, dysphagia, dyspnoea, excessive salivation. On local examination, an area of palpable crepitus was felt over the left upper border of clavicle and around left shoulder isolated over left side. Blood investigations were within normal limits. Non - contrast Computerised tomography (CT) scan of neck and head was done suggestive of suspicious focal discontinuity in its posterior wall of visualised trachea (just above carina) towards left side and communicated fracture of coracoids process of left scapula. Otorhinolaryngology opinion was taken for the same and an indirect laryngoscopy was done, and no macroscopic rent could be visualised. Ophthalmological consult revealed no abnormal air accumulation in and around the orbits with no evidence of any air embolism seen on fundoscopy. Contrast enhanced CT of the neck done, showed evidence of subcutaneous emphysema and pneumomediastinum. Vascular surgery opinion was taken for subcutaneous emphysema and bronchoscopy was advised to look for any visible rent. Bronchoscopy was performed a week after admission suggestive of hyperaemic mucosa just below vocal cords on anterior wall in between subglottic area and upper border of trachea. Orthopaedic consult was taken along with review opinion from vascular surgery, and they had advised adequate analgesia and immobilisation and sequential radiographs to look for radiological and monitoring for clinical reduction of emphysema. In the course of her hospital stay, with high flow oxygen therapy, and other conservative methods, the subcutaneous emphysema gradually reduced and she was discharged.

2. Discussion

Pneumomediastinum is a clinical condition characterized by presence of air in mediastinum. It is classified into two categories as spontaneous and secondary and is frequently seen because of traumatic causes. In our report, we present a case of diffuse mediastinal and subcutaneous emphysema after strangulation, unrelated to penetrating injury. After detailed anamnesis, it was found that it was not a simple penetrating injury but as a complication of blunt trauma injury. Spontaneous pneumomediastinum commonly occurs in healthy young men and women in whom an increased intra - alveolar pressure leads to rupture of terminal pulmonary alveoli. The air ascends along the bronchi to the mediastinum to the subcutaneous space of neck, causing cervicofacial

subcutaneous emphysema. Pneumomediastinum otherwise known as mediastinal emphysema refers to the presence of air in subcutaneous tissue and this may involve the face, neck, or trunk. Pneumomediastinum or subcutaneous emphysema as a complication of accidental strangulation is a rare entity, which we report in this case.

3. Conclusion

This report reminds us to be always vigilant and evaluate every blunt trauma injury case for underlying internal hollow viscus injuries and points to the fact that, not all cases of pneumomediastinum requires interventions and can be managed conservatively

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Two figures showing incomplete ligature marks

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Sagittal and coronal sections of the CT Scan of the patient showing no obvious airway injury in the form intact mucosal and serosal lining



Figure A showing chest XRAY of Patient with air shadows as marked by arrows Figure B showing contrast enhanced CT Scan with air shadows in muscle planes in multiple areas

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Figure AFigure BFigure A shows subglottic larynx suggestive of no serosal injuryFigure B shows trachea suggestive of no serosal injury