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A case of tubercular subcutaneous emphysema

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Abstract

Introduction: Subcutaneous emphysema is the presence of air within the subcutaneous tissue. Its cause is likely trauma and surgery. Other causes are rare. We report a case of tubercular subcutaneous emphysema with a fistula between airway and subcutaneous tissue diagnosed by 3D virtual bronchoscopy and confirmed by bronchoscopy.

Case Report: NECT BRAIN shows presence of air within the subcutaneous plane. CT THORAX shows subcutaneous plane and cavitation and nodule within the lungs. CT 3D virtual bronchoscopy shows a dimple suggesting a fistula formation. With proper Anti- TB treatment there's resolving of air within the subcutaneous plane and resolving of lung changes.

Keywords: subcutaneous emphysema, 3d virtual bronchoscopy, tuberculosis

Introduction

Presence of air within the subcutaneous layer of skin is named subcutaneous emphysema. The causes are usually after any surgical procedures, trauma to the chest or some pathologic process within the tract causing alveolar rupture. Within the absence of the above mentioned condition, subcutaneous emphysema may be a rare phenomenon. We report one such case where there's a fistula formation caused likely thanks to tuberculosis between airway and subcutaneous tissue which is demonstrated using 3D virtual bronchoscopy and was confirmed by bronchoscopy [4]

History:- A 35 year old male came with chief complaints of Cough with scanty expectoration, whitish colored since 1 month which was increased since last week, persisting throughout the day, more on lying down while relieved by sitting, Yellowish discoloration of eyes since 1 week, swelling over face and neck since 2 days and left ear bleed since 2days. Patient is a chronic alcoholic. No history of hemoptysis, breathlessness, hematemesis. No history of trauma. No history of TB, DM, HTN. No history of blood transfusion. History of the patient revealed that he was earlier diagnosed with hypersplenism on bone marrow aspirate. On examination shows subcutaneous emphysema was present extending from cheek upto lumbar region.

Patient was thin built, confused and icteric.

No cyanosis, clubbing, edema feet or lymphadenopathy.

BP-110/70mmHg, pulse-110/min, respiratory rate- 26/min, SpO2- 90% on room air.

- CVS- S1S2+, normal.
- RS- Air entry equal with bilateral basal crepitations+
- P/A-soft/non-tender, spleen palpable upto the umbilicus. Liver not palpable.
- CNS-Confused

Investigations

- CBC s/o pancytopenia with HB-7.5gm%, TLC-1500/ mm³, PLATELET- 0.29x³10³/microliter
- LFT s/o total bil-7.3mg/dl, direct bil-6.0mg/dl, SGOT-62units, SGPT-23units, ALK PHOS -132IU/L
- TOTAL PROT-5.6gm/dl, SR.ALBUMIN-1.1gm/dl, A:G-0.24
- KFT -NORMAL

- HIV/HBSAG – NEGATIVE
- P-ANCA and c-ANCA – NEGATIVE
- ANA – NEGATIVE

Patient was advised NECT brain which showed subcutaneous emphysema in the bilateral premaxillary region, along with bilateral masticator muscles in buccal-masticator space, in extracalvarial region in bilateral temporal region and bilateral

parietal region, Emphysema is additionally noted in bilateral parapharyngeal space, carotid space, infratemporal fossa, pterygopalatine fossa and temporal fossa, Diffuse subcutaneous and intermuscular emphysema is noted in pre and paravertebral spaces, Hemotympanum with hemosinus of mastoid air cells is noted.

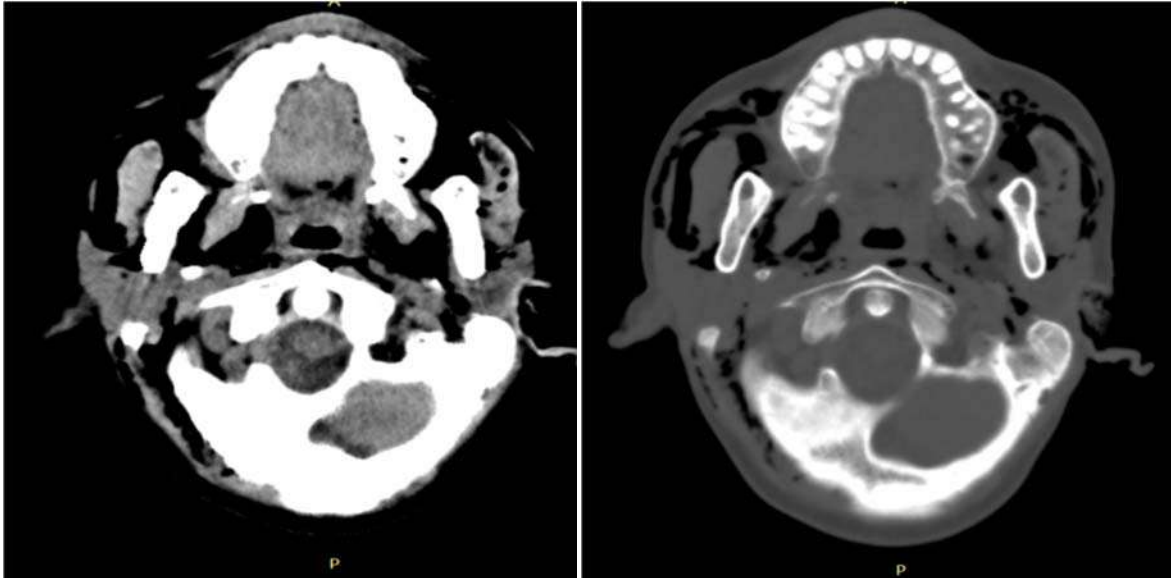


Fig 1: NECT brain axial section (brain window on right and bone window on left) shows air in the subcutaneous plane suggestive of subcutaneous emphysema.

Patient was then advised CT thorax. CT thorax showed Multiple well defined nodular lesion in bilateral lung fields, Peripherally placed lesions shows parenchyma bands reaching up to pleural margins. Multiple centrilobular nodules, few of them showing tree in bud appearance. Few of them shows central cavitation nodules 2.

Ground glass opacities in bilateral lung 3. Multiple mediastinal subcentimetric lymph nodes are noted 4. Two fistulous tract is noted arising from trachea at T1-T2 vertebral level and at carina which results in presence of air in a subcutaneous plane extending from neck to visualised abdomen.

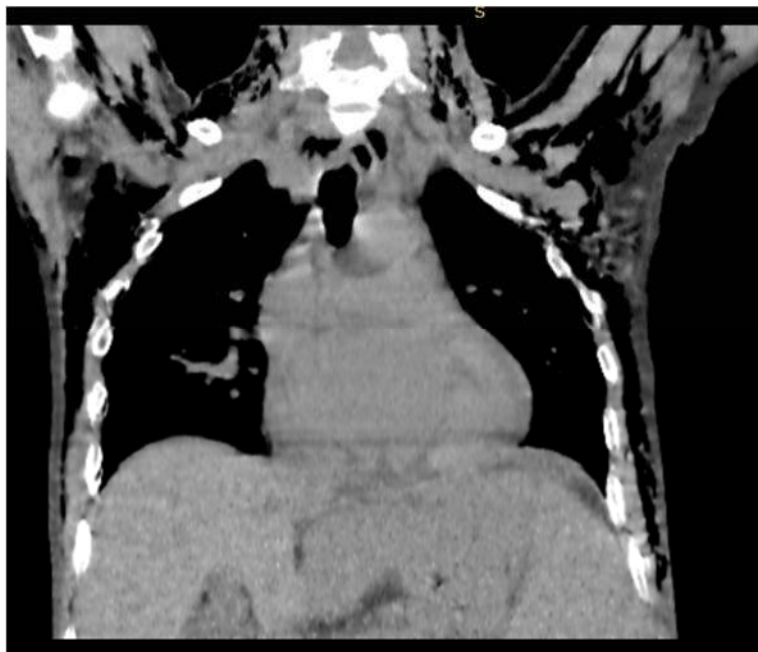


Fig 2: CT thorax mediastinal window coronal section shows air in the subcutaneous plane in bilateral neck, axilla and chest region.

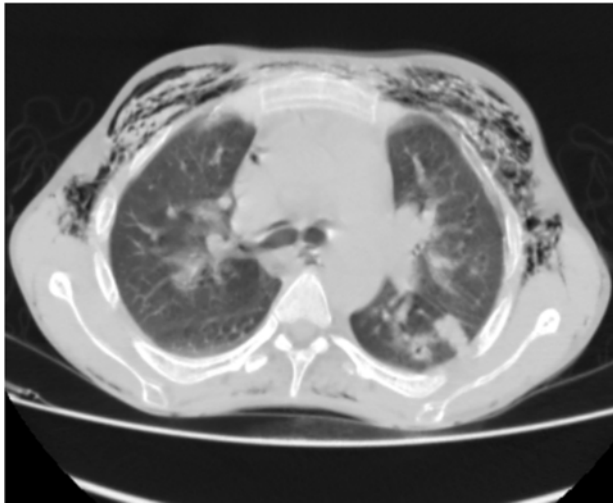


Fig 3: CT thorax lung window axial section shows air in the subcutaneous plane bilaterally and a tiny cavitary lesion with adjacent nodules are noted in the left lung.

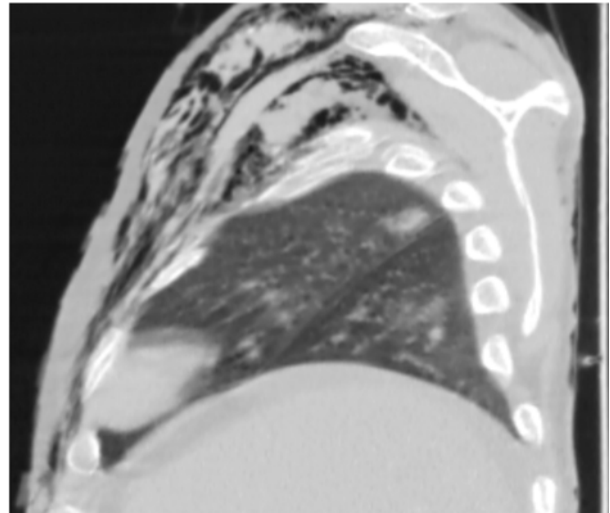


Fig 6: CT thorax sagittal section shows air in the subcutaneous plane and nodules in the upper lung lobe.

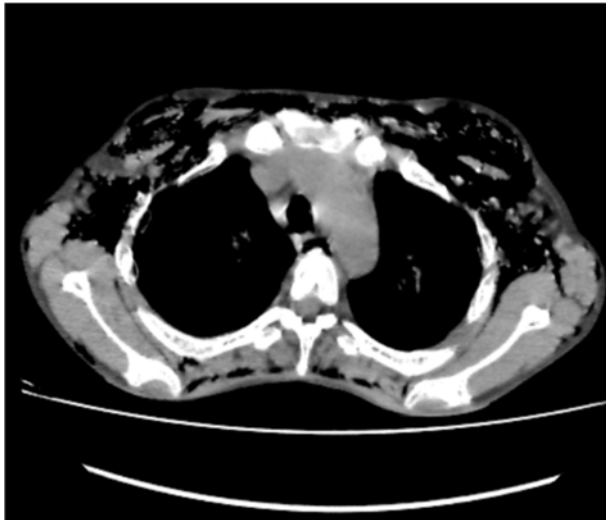


Fig 4: CT thorax mediastinal window axial section shows air in the subcutaneous plane bilaterally

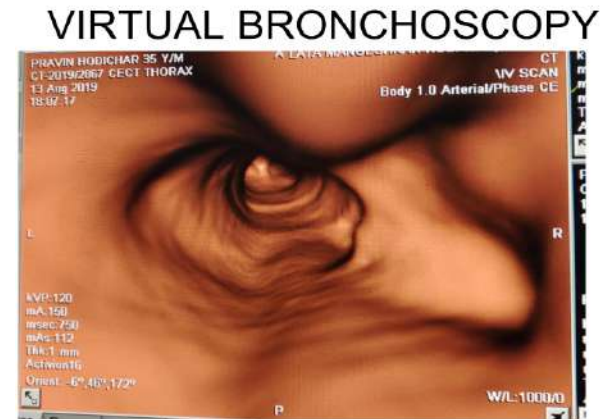


Fig 7: 3D virtual bronchoscopy- presence of dimple suggestive of suspicious fistula

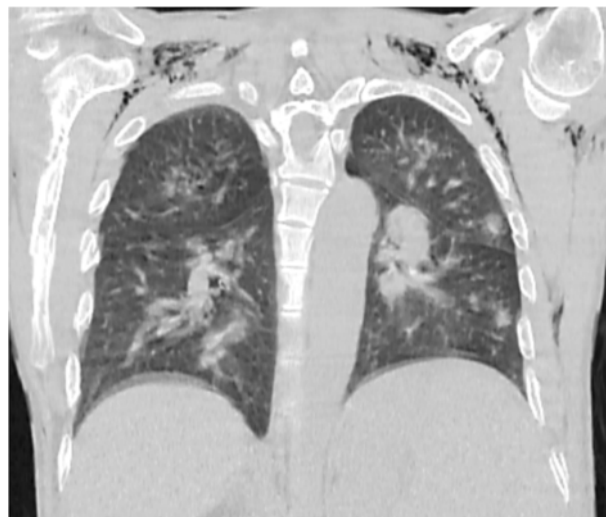


Fig 5: CT thorax lung window coronal section shows air in the subcutaneous plane of the neck bilaterally and multiple nodule in bilateral lung.



Fig 8: Bronchoscopy was performed which showed a fistula tract below the vocal cord

Treatment- Patient was placed on anti-tubercular drug and was observed for management of subcutaneous emphysema as there was no obvious respiratory distress or pneumothorax.

Follow up* HRCT THORAX reveals no fistula and only few nodules in lung parenchyma
3D VIRTUAL BRONCHOSCOPY reveals scarring of the world.

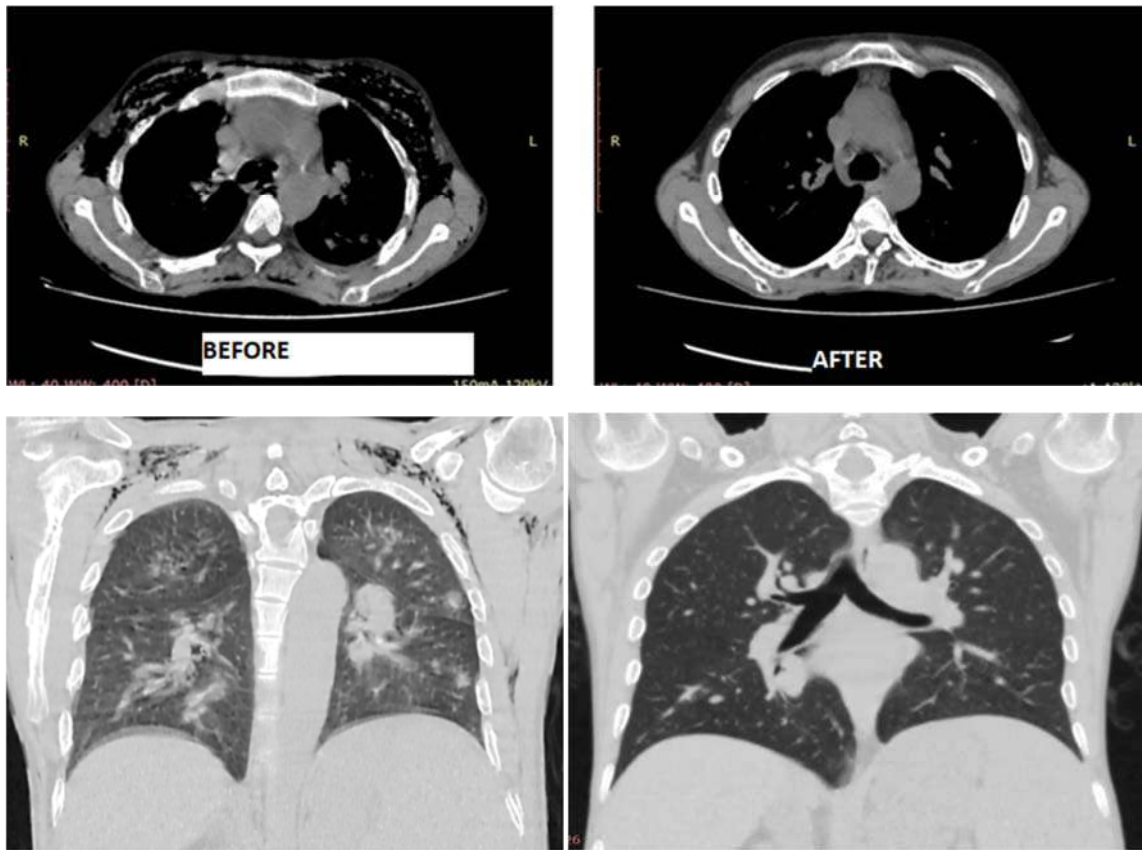
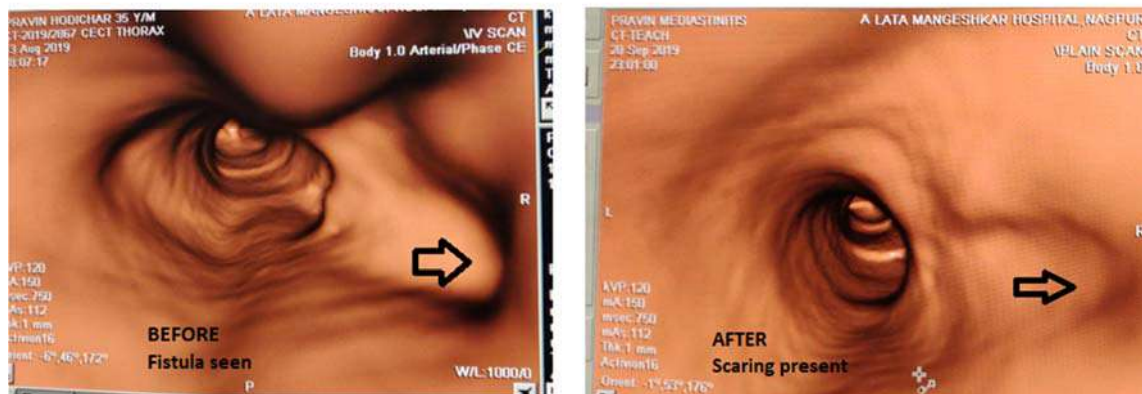
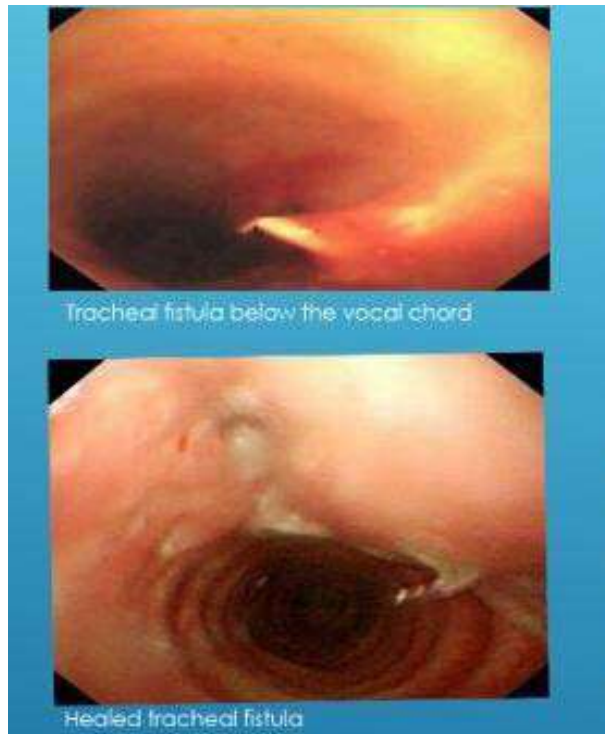


Fig 9: shows after treatment with anti-TB drugs there is resolution of the subcutaneous emphysema and lung lesions.

VIRTUAL BRONCHOSCOPY



Bronchoscopy



Discussion

Subcutaneous emphysema is defined as presence of air within the subcutaneous tissue. The causes of subcutaneous emphysema are as follows:-

- 1 Surgical causes mentioned as surgical emphysema. e.g. During chest tube insertion, tracheal intubation, upper GIT instrumentation.
- 2 Trauma- blunt or penetrating
- 3 Secondary to pathological changes within the respiratory tract- alveolar rupture results in escape of the air which then enters the perivascular sheath then into the hilum and mediastinum. Subsequently the air spreads into the neck and subcutaneous planes and accumulates in areas where the subcutaneous tissue is most relaxed. [2-5]

Tuberculosis can also be one among the explanation for subcutaneous emphysema thanks to associated pneumothorax, pneumomediastinum, or following the chest tube insertion. It could also be seen in miliary also as non-miliary and therefore the cavitary sorts of pulmonary lesions. The likely pathogenesis is that there are adhesions between visceral and pleura over the areas of tuberculosis lung and a tear of such pleural symphysis into subcutaneous tissue may produce emphysema [5]. Another mechanism is that local airway obstruction and distal airway trapping also can cause alveolar rupture and subsequent pneumomediastinum in tuberculosis then subcutaneous emphysema [8]. In our case there was a demonstrable fistula seen by radiological investigation that's 3D virtual bronchoscopy and confirmed by bronchoscopy which is probably going mechanism for subcutaneous emphysema. Treatment of subcutaneous emphysema is High- concentration oxygen. It results in resorption of all sorts of air leaks are reabsorbed into capillaries by diffusion along a partial pressure gradient caused by gases in air, mostly nitrogen and oxygen. Breathing 100% oxygen causes nitrogen to scrub out of the blood, thus increasing the gradient and causing a four- to six-fold rise within the rate of gas absorption [1]. Over the time with anti-

tubercular therapy the fistula gradually healed and there was no leak from the bronchus into subcutaneous plane and ultimately the air already present in subcutaneous plane was replaced by supplemental oxygen therapy which was absorbed into subcutaneous tissue.

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