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Case Report

Ginkgo leaf sign on X-ray chest due to subcutaneous emphysema in a COVID-19 patient

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ABSTRACT

Subcutaneous emphysema (SE) is usually encountered in cases of structural lung diseases and secondary to direct trauma or iatrogenic procedures for airway access. It is mostly associated with pneumothorax. The diagnosis is made clinically by palpation of the affected area and radiology. Here we presented a case of COVID-19 pneumonia presenting with extensive subcutaneous emphysema resulting in airway compression which was a very rare manifestation of COVID-19 infection. The COVID-19 infection led to extensive alveolar damage to the lungs and the chronic cough which may have led to this complication due to sudden change of pressure differences in the chest wall cavity. The limitation of using of personal protective equipments hindered the diagnosis of this condition as auscultation and the palpatory feelings were greatly hindered. The chest X-ray shows air in subcutaneous space and the prominence of the fibres of bilateral pectoralis muscles which gives an impression of the venous system of a Ginkgo leaf, so named as Ginkgo leaf sign.

Keywords: Subcutaneous emphysema, Ginkgo sign, Chest X-ray, Spontaneous emphysema, COVID-19, Acute breathlessness

INTRODUCTION

SE is the presence of air in the subcutaneous space. Most commonly occurs in the chest and neck but may involve the face or may extend to the abdomen which can be mistaken as angioedema or subcutaneous oedema. The etio-pathogenesis extends from being spontaneous in structural lung pathologies to manifest after an iatrogenic procedure or secondary to trauma.[1] COVID-19 infection presents with primary complications related to the lungs. Complications such as pneumomediastinum (PM/pneumothorax or spontaneous subcutaneous emphysema during the infection without mechanical ventilation is rare and is poorly described in patients of COVID-19.[2] Here we presented a case of COVID-19 ARDS patient presenting with subcutaneous emphysema with no evidence of pneumothorax or pnemomediastinum.

CASE REPORT

A 48 year old gentleman with no past co-morbidities or any past history of smoking and chronic lung disease presented to the medical emergency referred from a COVID-19 care hospital where he was admitted with SARI (severe acute respiratory illness). He was diagnosed as COVID-19 positive thirteen days ago and managed with the protocol of dexamethasone 8 mg and oxygen delivery with non-rebreather mask as well as empirical antibiotics. The patient on the fourteenth day developed sudden severe breathlessness and rapid fall in oxygen saturation. The patient had a GCS (Glasgow coma scale) of E2V2M4 with

palpable crepitant swelling on the neck and anterior chest wall. The vitals of the patient recorded at the time of presentation was blood pressure of 90/50 mm of Hg (vasopressor support of nor-adrenaline at 4 mcg/min continuous IV infusion) and pulse rate of 130 per minute. The recorded vitals in the referral slip during his admission before breathlessness was 114/80 mm of Hg and heart rate of 80 to 90 breaths/minute and no mention of any obvious swelling of face and chest wall was mentioned. The arterial blood gas analysis had evidence of respiratory acidosis (pH=7.314, pCO_2=137.5 mm of Hg, HCO_3=45.1 mmol/l, O_2 saturation=92.6%, lactate=1.01 mmol/l). The patient's chest X-ray taken had evidence of bilateral inhomogenous opacities of the lung field and evidence of air in the subcutaneous tissues around the neck and axilla with radiolucent striations around the fibres of the bilateral pectoralis major muscles (Gingko leaf sign) (Figure 1).[3] The patient was started on supportive mechanical ventilation and the investigations revealed a neutrophil predominant leucocytois and elevated CRP and IL-6 levels. Patient was managed with multiple superficial incisions (Gills procedure) on the subcutaneous tissue for the subcutaneous emphysema and tracheostomy was performed for adequate mechanical ventilator support with positive airway pressure ventilation.[4] The patient's carbon dioxide (PCo_2) improved in a day but the patient had progression of ARDS and ventilator associated pneumonia following which he succumbed to his illness on the fifth day of ICU stay.

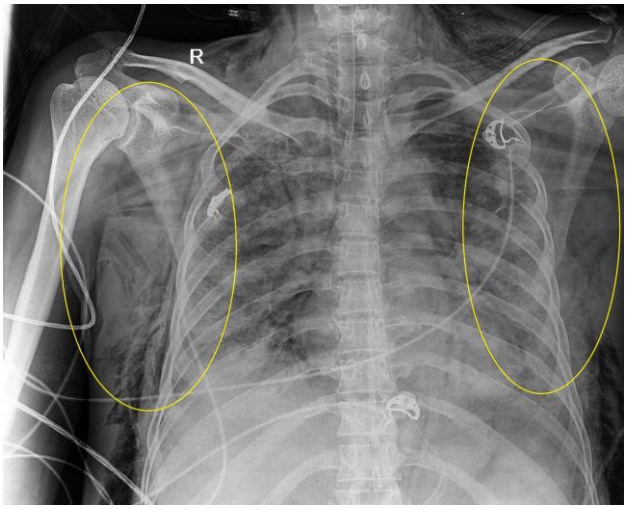

Figure 1: Chest X-ray showing the air in the subcutaneous tissue around neck and chest and the individual fibres of pectoralis major muscles (marked in yellow) appearing as striations on a Gingko leaf, Gingko leaf sign.

DISCUSSION

COVID-19 infection usually present with pneumonia and characteristic CT findings of ground glass opacities, so radiological investigations is an integral part of assessment and diagnosis of the COVID-19 infection.[5] The patient suffering from severe acute respiratory illness following COVID-19 infection and later presenting with extensive subcutaneous emphysema with evidence of compression of airway in a COVID19 is not a very common finding in the medical literatures available apart from some case reports.[2,6] The most common causes for the extensive spontaneous subcutaneous emphysema may be explained by prolonged cough and aggressive disease pathology of COVID-19 infection. The pathophysiology mechanism were air leakage through the alveolar walls, damage by inflammation and damage by subsequent cytokine storm.[7,8] The chest X-ray shows air in the soft tissue space and prominent striations of the pectoralis muscle which gives an impression of Ginkgo leaf and hence the name of the sign as Gingko leaf sign.[3] Ideally the diagnosis of subcutaneous emphysema is done clinically by palpating the subcutaneous tissue which gives a crepitant feeling.

CONCLUSION

The major challenges in the care of COVID-19 patient are the limitation in use of clinical methods including auscultation and palpation due to use of personal protective equipments by the health care providers and difficulties faced to take advantages of the different modalities of radiography which may not be available at newly set up COVID-19 care centres for mild cases or many centres do not have separate facilities for COVID-19 cases especially in developing countries. The evidence of barotraumas in COVID-19 cases in ICU care who are on mechanical ventilator support has been recorded high upto 9.8% and they have poor outcome in comparison with patients with no baro-trauma. As the pandemic has progressed over the months various uncommon manifestations has been added to the medical literature for better understanding of the disease. The case is a rare manifestation of the COVID-19 as extensive SE without any development of pneumothorax.

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