

Case Report

Ginko leaf sign and subcutaneous emphysema in a patient with COVID-19

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ABSTRACT

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Subcutaneous emphysema (SE) refers to air in the subcutaneous tissues. Diagnosis is usually clinical, yet radiological confirmation is also useful. We present a case report of subcutaneous emphysema in a male patient with COVID-19 with presence of ginko leaf sign in radiological evaluation.

Keywords: Ginko leaf sign, Subcutaneous emphysema, COVID-19

INTRODUCTION

Subcutaneous emphysema (SE) refers to air in the subcutaneous tissues. Clinical manifestation is generally benign, yet in several cases it can provoke serious complications such as airway compromise, respiratory failure, pacemaker malfunction and tension phenomena.

Treatment is usually aiming at the underlined cause, while the air is gradually absorbed from interstitial tissues. However, in extensive cases,

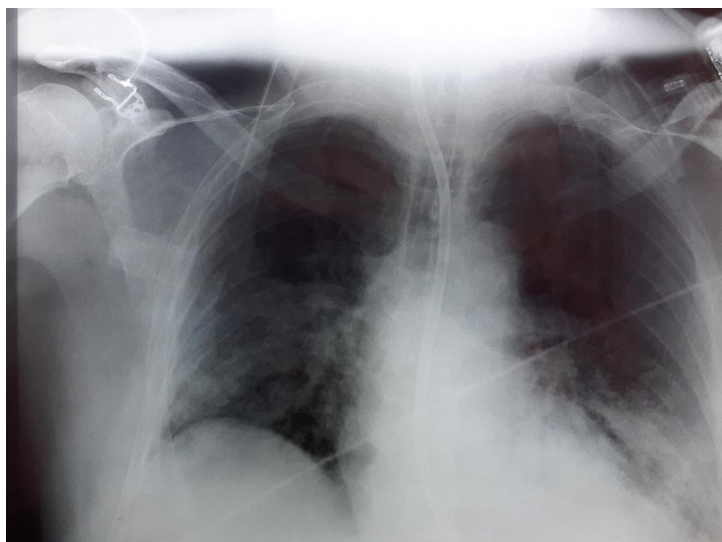
surgical intervention may also needed¹. In the present article we present a case report of subcutaneous emphysema in patient with COVID-19 with presence of ginko leaf sign.

CASE REPORT

A 60-year-old man was transferred to our ICU, after presented with acute respiratory failure due to COVID-19, in another hospital (quick COVID-19 severity index-qCSI:12); and intu-

bated soon after, in the emergency department. On admission a chest X-ray (CXR) was performed to confirm the position of endotracheal

Figure 1. First CXR at ICU admission.

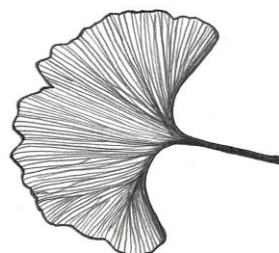


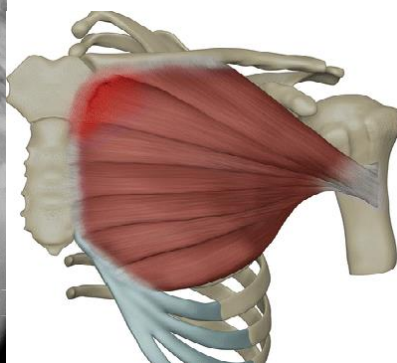
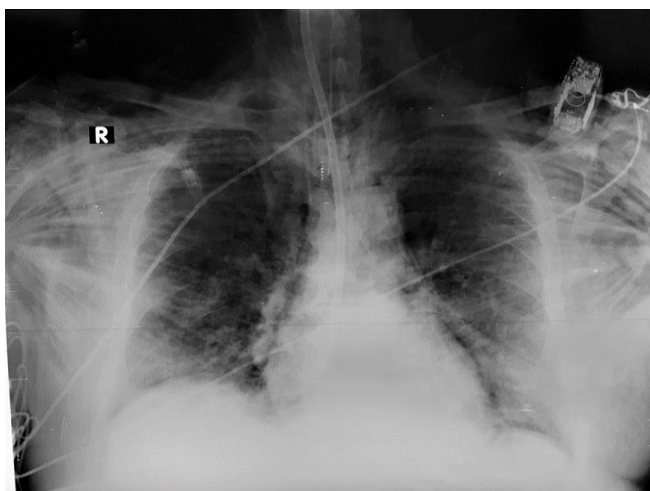
tube with findings correspondant to COVID lung involvement (Figure 1).

Yet, 28 hours post intubation clinical examination revealed signs of SE (Aghajanzadeh Grade IV), yet with slowly deterioration on respiratory monitoring parameters. Two consequent emergency CXRs revealed air in subcutaneous

tissues around the neck and axilla with radiolucent striations around the individual fibres of bilateral pectoralis major muscles (Ginkgo leaf sign) (Figure 2).

Figure 2. Two CXRs taken 3 hours apart with signs of SE: Ginkgo leaf sign (sketch of the leaf and pectoralis muscle major on the right) and air in the mediastinum.

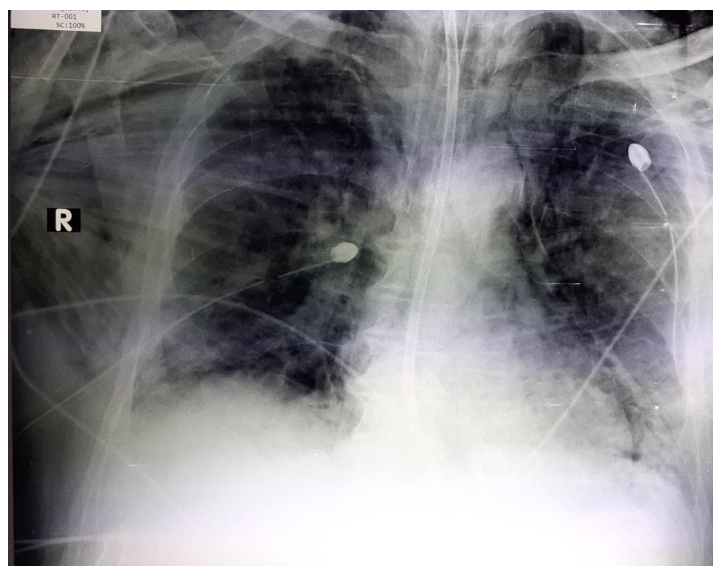




Though initially treated conservatively, due to steadily aggravating respiratory parameters, two chest drainage tubes were positioned in each side (Figure 3). Subcutaneous emphysema decreased over the next 3 days and the chest tubes

were removed. Unfortunately, the patient passed away after 14 days because of complications (in-hospital XDR *Klebsiella pneumoniae*, MDR *Acinetobacter baumannii* and *Aspergillus fumigatus* lung infection) during his ICU stay.

Figure 3. CXR with chest drainage tubes in situ.



DISCUSSION

SE etiology include surgical, traumatic, infectious conditions or even non underlying cause (spontaneous); with an incidence reported anywhere between 0.43-2.34%². Male sex and age

over 50 seem to be more often suffering from SE. Mechanisms for SE development include¹: 1) Injury to the parietal pleura that allows for the passage of air into the pleural and subcu-

taneous tissues 2) Air from the alveolus spreading into the endovascular sheath and lung hilum into the endothoracic fascia 3) The air in the mediastinum spreading into the cervical viscera and other connected tissue planes. 4) Air originating from external sources and 5) Gas generation locally by infections, specifically, necrotizing infections. Grading scores of the extend of SE have been validated in some studies, yet they remain underused in clinical practice².

Diagnosis is clinical by palpating crepitus in the involved area. CXR shows air in the soft tissues and air around the pectoralis major create radiolucent striations outlining the individual fibre and gives the appearance of the venous system of Ginkgo leaf known as Ginkgo leaf sign³.

The majority cases are nonfatal and self-limited; yet in surgical intervention may also be necessary when there are compression symptoms¹. In our patient, we believe that subcutaneous was secondary to tracheal injury following endotracheal intubation, a condition that is rare (0.005%). Bronchoscopic and computer tomography may provide valuable information in management of such cases. Due to SE extend (into mediastinum), a more “aggressive” strategy was followed.

CONCLUSION

Tracheal injury is a rare complication of endotracheal intubation and timely intervention can

prevent morbidity and mortality. This chest radiograph shows the classical appearance of ‘Ginkgo leaf’ sign.

All cases of subcutaneous emphysema do not require active intervention; yet when needed, it should not be delayed.

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