PNEUMOTHORAX IN COVID19 INTUBATED PATIENTS: A CASE SERIES

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Introduction:

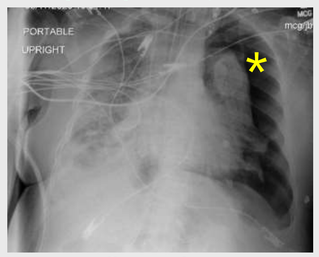
Pneumothorax is a rare complication among mechanically ventilated patients and is higher in patients with high positive end-expiratory pressure (PEEP)[1].
Herein we describe a case series of nine patients who were intubated due to acute respiratory disease syndrome (ARDS) secondary to coronavirus disease 2019 (COVID-19) and developed pneumothorax in due course.

Case Description:

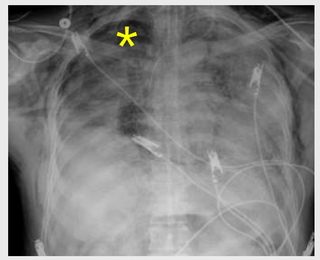
- Nine patients with COVID-19 pneumonia who developed ARDS, were on a mechanical ventilator (volume control mode) and who eventually developed a pneumothorax, were analyzed retrospectively and outcomes were studied.
- The characteristics of patients like age, gender, and body mass index (BMI) were compared.
- Past medical history including smoking history was taking into consideration as well.
- We compared the total number of days on the ventilator, the highest PEEP they received, and the ventilator day when pneumothorax developed.

	Age (in years)	Gender	BMI (kg/m^2)	Smoker	Chronic Lung Disease	Other Past Medical History	Total Ventilator Days	Highest PEEP	Ventilator Day When Pneumothorax Developed
1.	54	Male	32	No	No	HTN, DM	44	14	14
2.	55	Male	21.2	No	No	HTN, DM	58	12	21
3.	41	Male	26.8	No	No	None	22	15	18
4.	48	Male	30.2	No	No	HTN, DM HLD, ESRD, PVD	7	10	2
5.	48	Male	34.8	No	No	HLD	19	16	8
6.	70	Male	Unknown	No	No	HTN, DM, HLD, RCC s/p nephrectomy	5	16	2
7.	61	Female	31.9	Former	COPD	HTN, DM	9	14	5
8.	66	Male	30.3	No	No	HTN	4	15	1
9.	58	Male	34.1	No	No	None	42	16	7

Treatment: Cases 1,2,3,5,8 and 9 were treated with high dose steroids, hydroxychloroquine, tocilizumab, and convalescent plasma. Case 9 was treated with remdesivir. Case 7 received a high dose of steroids and hydroxychloroquine. Cases 4 and 6 were treated only with hydroxychloroquine. All patients died at the end of their hospital stay.



Case 1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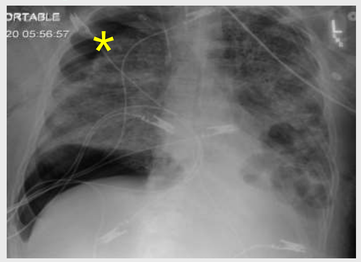

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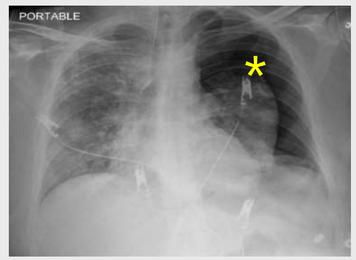

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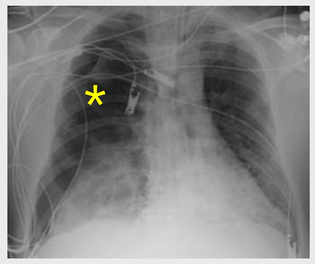
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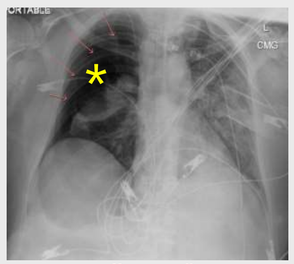
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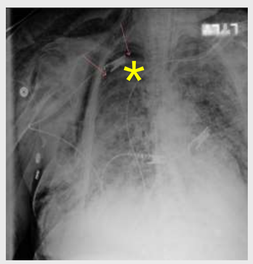
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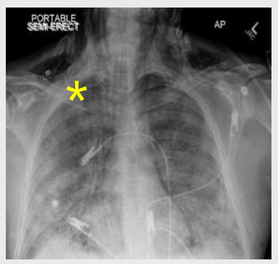
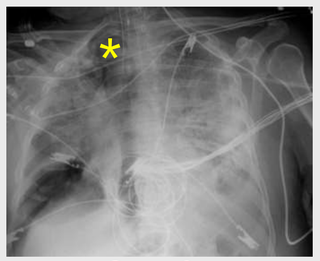


Case 8


Case 9

* : Pneumothorax

Discussion:

Patients with COVID19 are at a higher risk of pneumothorax due to severe inflammation.
It can be seen in any stage of the disease and might not be associated with the severity of the illness[2]. Bullae formation and pneumothorax can be seen in previously healthy lungs.

In our case-series of patients with COVID-19 who developed a pneumothorax had a large bore chest tube placed. The mortality was noted to be 100%.
The majority of patients were non-smokers and had no history of lung disease. Only one patient was a former smoker and had chronic obstructive pulmonary disease.

High PEEP & low Fraction of inspired oxygen (FiO2) strategy is commonly used in patients with ARDS who are on a ventilator. As per NIH NHLBI ARDS Clinical Network Mechanical Ventilation Protocol, patients with ARDS and mechanical ventilation can be managed with 2 strategies: high PEEP, low FiO2, and low PEEP and high FiO2[3]. Literature suggests that there is no significant difference between the outcomes in the two strategies.

COVID-19 is a new illness with no specific guidelines on the management of ventilators. Intensivists should be cautious while maintaining PEEP in such patients and all efforts should be made to prevent pneumothorax in COVID patients. High FiO2 and low PEEP strategy should be considered while managing patients with COVID19 who are on a ventilator. There is a need for large-scale studies to co-relate with these outcomes.

References:

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