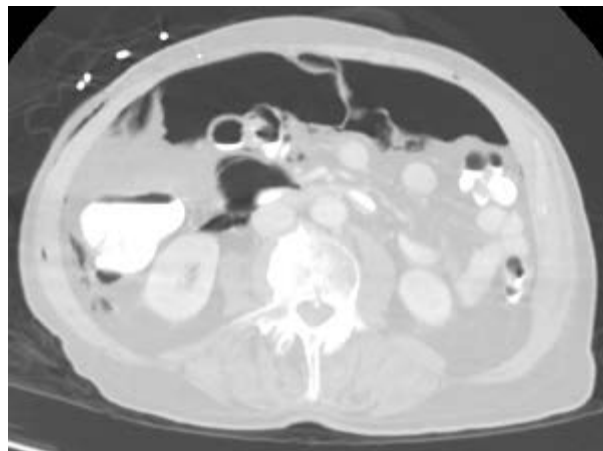


BAROTRAUMA IN COVID-19 ILLNESS

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Barotrauma in Covid-19



Barotrauma in ARDS Pre-Covid-19

- ARDS is highest risk group of mechanically ventilated pts
- Incidence decreasing over latter period of 20th century
- Meta-analyses and prospective clinical trials show incidence around 5-10%

Anzueto Intensive Care Med 2004; 30:612

Briel JAMA 2010; 303:865

Papazian N Engl J Med 2010; 363:1107

Guerin N Engl J Med 2013; 368:2159

Barotrauma was Prevalent in SARS-CoV-1

- Kao 5/41 pneumothorax (12%)
- Fowler 10/29 barotrauma (34%)
- Lien 2/14 pneumothorax (14.3%)
- Gormersall 7/27 barotrauma (25.9%)
- Lew 9/39 barotrauma (23%)

Kao Critical Care 2005; 9:440

Fowler JAMA 2003; 290:367

Lien J Crit Care 2008; 23:557

Gormersall Intensive Care Med 2004; 30:381

Lew JAMA 2003; 290:374

Barotrauma Incidence in Covid-19

Author	<i>n</i>	# Barotrauma	Barotrauma%	Comment
Udi	20	8	40%	Median Vt 5.4
Housman	171	29	17%	SWAP
McGuinness	601	89	15%	
Lemmers	169	23	13.6%	
Elsaaran	279	54	19.4%	

Udi J Intensive Care Med 2020; Aug pg 1
Housman Ann Transl Med 2020; 8:1575
McGuinness Radiology 2020; 297:E252
Lemmers ERJ Open Res 2020; 6:00385
Elsaaran Ann Med Surg 2021; Jan pg 1

Graham, Willms

- Case-control, n = 22, 13 with barotrauma
- Barotrauma:
 - 9 pneumothorax
 - 8 pneumomediastinum
 - 7 subcutaneous emphysema
 - 1 pneumoperitoneum
 - 1 pneumopericardium
 - 8 multiple types of barotrauma
- Mean time to barotrauma after intubation: 4.8 d
- Mean V_T 6.9 mL/kg PBW
- Statistical correlation of Ferritin level ($p = 0.046$) and use of convalescent plasma ($p = 0.011$) with BT

Pneumothoraces Unrelated to Mechanical Ventilation

- Primary spontaneous pneumothorax
 - Secondary spontaneous pneumothorax
 - Inhalational drug use
 - Blunt or penetrating chest trauma
 - Catamenial
-
- Seen with some frequency in non-intubated patients with Covid-19, including some on NIV, some never on NIV

Management of Barotrauma in Mechanically Ventilated Covid-19 Patients

- Large, or tension pneumothorax -> immediate chest tube
 - ? Percutaneous preferred over usual open thoracostomy
 - Risk of aerosol generation, lung injury, hemorrhage
- Role of expectant management with close observation?
 - Subcutaneous air, pneumomediastinum without PTX
- Ventilator adjustments?
- Sedation and paralysis?
- Role of ECMO?

*Abdallat J Lung Health Dis 2020; 4:8
Housman Ann Transl Med 2020; 8:1575*

Summary

- Pulmonary barotrauma appears to be more common in Covid-19 patients on mechanical ventilators, than in prior studies of ARDS patients in the current era
- All forms of barotrauma are seen
- May relate to the inflammatory/necrotic effects of Covid-19 infection
- Appears to worsen prognosis in some studies
- Can occur in patients on non-invasive ventilation or spontaneously without positive pressure support
- Some can be managed conservatively, but chest tubes are required for moderate or large pneumothorax