COVID Coagulopathy: Case Presentations

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Case #1

- 55yoF (Jehovah’s Witness) PMH HTN and fibromyalgia
- Presented with 1 week of fevers, chills, cough
- SARS-CoV-2 (+)
- On arrival to the ED, oxygen saturation 80% on RA, placed on high flow nasal cannula (HFNC)
Case #1
ICU Course

• Intubated for progressive hypoxemia

• Severe ARDS (P/F 62 on 100% FiO2, 16 PEEP)
  • Paralysis
  • Proning
  • Inhaled epoprostenol
  • Empiric treatment for PNA

• Bedside ultrasound concerning for LUE DVT
  • Started on therapeutic heparin drip

• Oliguric renal failure ➔ CRRT
Monitored Coagulopathy/Inflammation Labs

D-dimer
Fibrinogen
CRP
INR, PTT
Platelets

AT-III levels
Anti-Xa levels

Measures of fibrinolysis
Plasma viscosity (normal 1.4-1.8 cP)
Thromboelastography (AKA TEG, ROTEM)

https://link.springer.com/chapter/10.1007/978-3-642-55004-1_3
<table>
<thead>
<tr>
<th>Item</th>
<th>INTRINSIC PATHWAY</th>
<th>EXTRINSIC PATHWAY</th>
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<tbody>
<tr>
<td>EXTEN CT</td>
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<td>EXTEN CFT</td>
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<td>EXTEN Alpha angle</td>
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<td>EXTEN A10</td>
<td>* (H) 73</td>
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<td>EXTEN A20</td>
<td>* (H) 77</td>
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<tr>
<td>EXTEN MCF</td>
<td>* (H) 78</td>
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<td>EXTEN ML</td>
<td>* 5</td>
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Normal approximately 5-15

? Fibrinolysis Shutdown
Does your institution have a protocol for giving higher than prophylactic doses of AC for COVID patients?

A. Yes, based on D-dimer

B. Yes, based on a different lab(s)

C. Yes, based on severity of illness (e.g. ICU)

D. No
May 12\textsuperscript{th} (HD #4)

- FiO2 60\%→100\%
- PEEP 12→18
- Tachycardia
- POCUS- enlarged RV

- Hg 12
- Plt 267
- INR 1.4
- Anti-Xa level 0.77 (on hep gtt)
- CRP 264
- Fibrinogen 642
- Plasma viscosity normal
Next Step in Management?

A. Switch from heparin to a different anticoagulant
B. tPA
C. Therapeutic Plasma Exchange (TPE)
D. No change in management
Hep Gtt

D-Dimer

EXTEM ML

US +LUE DVT
US LEs Neg
US +LLE DVT

tPA 50mg x1 + 50mg (over 2hrs)
Case #1 Update

• Oxygen requirements improved over time, extubated on 5/20 (HD #11)

• Transferred to the floor 5/25, shortly after transferred home

• Complete renal recovery now off CRRT

• Discharged on apixaban
Case #2

- 58yoM with T2DM, obesity
- Present with 1 week of fevers, chills, cough
- SARS-CoV-2 (+)
- Intubated in the ED for respiratory distress and hypoxemia refractory to NRB
Case #2
ICU Course

- Severe ARDS (P/F 87 on 100% FiO2, 18 PEEP)
  - Paralysis
  - Proning
  - Inhaled epoprostenol
  - Empiric treatment for PNA

- Severe ileus/distention limited further proning

- AKI (Cr peak 2.3 from baseline 0.6)
## Monitored Coagulopathy/Inflammation Labs

- D-dimer
- Fibrinogen
- CRP
- INR, PTT
- Platelets
- AT-III levels
- Anti-Xa levels
- Measures of fibrinolysis (TEG, ROTEM)
- Plasma viscosity (normal 1.4-1.8 cP)
Why measure plasma viscosity in COVID?
May 3 (HD #10)

FiO2 70%
PEEP 14
P/F <100

Hg 9
Plt 607
INR 1.1
Anti-Xa level therap.
CRP 260
EXTEM ML 9 (nl)
Bedside Ultrasound
Femoral Vein

Spontaneous Echo Contrast (SEC)

- AKA “Smoke”
- Echogenicity of blood in absence of contrast
- Optimize gain to measure
Is bedside POCUS (point of care ultrasound) a routine part of your assessment for VTE/coagulopathy in COVID patients?

A. Yes
B. No
Next Step in Management?

A. Switch from heparin to a different anticoagulant
B. tPA
C. Therapeutic Plasma Exchange (TPE)
D. No change in management
D-Dimer

Fibrinogen

LMWH BID

Hep Gtt

US LEs Neg

Plasma Exchange x2

Plasma viscosity


0

2.5

?

2.6

2.3

1.9

0 200 400 600 800 1000 1200

5000 10000 15000 20000 25000
Case #2 Update

- Decreasing requirements of FiO2 and PEEP
  - Extubated 5/9 (HD #16, 4 days after TPE started)
- Cr returned to baseline
- Discharged to inpatient rehab, then home 2 weeks later
- Completed a 4-week course of apixaban outpatient
<table>
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<td>A. Yes, PCP</td>
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<td>B. Yes, specialty clinic</td>
<td>pulmonary, hematology, AC clinic</td>
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<td>C. Yes, designated post-COVID</td>
<td>clinic</td>
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<tr>
<td>D. No</td>
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