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Arterial Thromboembolism as a Sequela of Mild COVID-19 Pneumonia with Resultant Gangrene of the Right Lower Extremity

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Coulson, Sean; Thomas, Brian; and Chhoun, Christopher, "Arterial Thromboembolism as a Sequela of Mild COVID-19 Pneumonia with Resultant Gangrene of the Right Lower Extremity" (2022). *Rowan-Virtua Research Day*. 12.

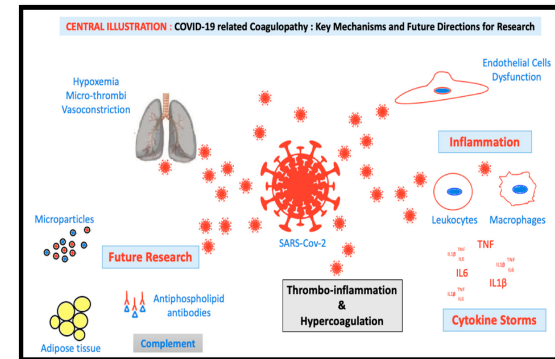
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School of
Osteopathic
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Background

- Hypercoagulable states leading to stroke, pulmonary embolism, and acute limb ischemia are well documented phenomena secondary to *moderate-to-severe* COVID-19 infections that produce significant respiratory morbidity.
- Incidence is largely unknown with additional emerging clinical manifestations including, but not limited to:
 - Viral and secondary bacterial pneumonia, respiratory failure, sepsis, stroke, acute kidney injury, pulmonary embolism, disseminated intravascular coagulation (DIC), as well as arterial and venous thromboembolism.
- The virus binds to healthy pulmonary tissue via the angiotensin converting enzyme 2 (ACE-2) protein receptor among others.
 - Exaggerated immune response facilitates endothelial dysfunction and end-organ damage.



- COVID-19 pneumonia initiates a prothrombotic coagulopathy secondary to an exaggerated diffuse inflammatory response
 - DIC, arterial/venous thromboembolic disease
- Cytokine storm IL-2, IFN- γ , IL-6, and IL-10 potentiate vascular injury, platelet activation, increased tissue factor
- Prevalence and incidence of coagulopathies in COVID-19 are not well-understood
- Severity of coagulopathy linked to severity of respiratory symptoms but association is not mutually exclusive as seen in this case report
- Management
 - Anticoagulation based on patient factors (pediatric vs pregnant vs AKI etc)
 - Role for prophylactic management in certain patient populations is under investigation
 - Several clinical trials are underway for optimal anticoagulation in admitted, discharged, and nonhospitalized patients

A 49 year old male with a PMH of residual SARS-CoV-2 one week prior to symptom onset, with a chief complaint of severe right lower extremity pain, swelling and weakness for 7 days.

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graph LR; A[1 Week Prior to Sx onset: Diagnosed with Covid19 via rapid antigen test. Pt notes mild/no respiratory symptoms.] --> B[Hospital Day 1: CT Angiography - occlusion of the superficial femoral artery extending into the popliteal artery]; B --> C[Hospital Day 2: Mechanical thrombectomy and tissue plasminogen activator (tPA) injection]; C --> D[Hospital Day 3 - 10: Maintained on heparin gtt with bridge to Warfarin]; D --> E[4 Weeks Post Discharge: Worsening right lower extremity 1st digit pain and swelling. Small area of gangrene of the right 1st metatarsal. Continue warfarin 5 mg PO and added aspirin 81 mg PO qd.]; F[Patient Presents to Emergency Department: Severe right lower extremity pain] --> G[Therapeutic INR]; G --> H[Symptoms unresolved.];
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1 Week Prior to Sx onset:
Diagnosed with Covid19 via rapid antigen test. Pt notes mild/no respiratory symptoms.

Hospital Day 1: CT Angiography - occlusion of the superficial femoral artery extending into the popliteal artery

Hospital Day 2: Mechanical thrombectomy and tissue plasminogen activator (tPA) injection

Hospital Day 3 – 10: Maintained on heparin gtt with bridge to Warfarin

4 Weeks Post Discharge: Worsening right lower extremity 1st digit pain and swelling. Small area of gangrene of the right 1st metatarsal. Continue warfarin 5 mg PO and added aspirin 81 mg PO qd.

Patient Presents to Emergency Department:
Severe right lower extremity pain

Therapeutic INR

Symptoms unresolved.

In the absence of major respiratory symptoms, this patient developed critical limb ischemia. Complications of COVID-19 must be considered in all patients. Further research is needed to optimally manage patients with vascular complications.

[illegible]