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Original Article

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Rotten Fruit in a Healthy Basket: Analysis of Surgical Complications in the First Wave of a Covid 19 Referral Centre

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ABSTRACT

Aims: To study 'UNUSUAL SITE THROMBOSIS' which was associated with increased morbidity and mortality.
Objectives : To study the following in COVID PATIENTS :

1. Evidence of thrombosis in young positive individuals.
2. To know the reason for failure of early identification of thrombotic condition

Materials and Methods :
This study is retrospective analysis of the patients who were admitted in the COVID 19 referral centre in the Sassoon General Hospital from the period of March 2020 to December 2020
All covid files were examined for :

- Documentation of local examination of extremities
- Discoloration of limbs
- Complaints of pain abdomen
- USG A-V Doppler of extremities reports
- CT peripheral angiography
- Referred patients for SMA thrombosis, intervention for thrombosis
- Amputations

Results and Conclusion :
This pandemic of COVID19 affecting globally has cost us many lives, these needs to be understood and prevented. This study concludes that majority of the surgical complaints were due to the complication of thrombosis either in the venous system or arterial system with majority limb and life threatening, these needs to be suspected early and managed accordingly if the circumstances repeats again.

Key Words: COVID 19, Thrombosis , Unusual site thrombosis

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INTRODUCTION:

Covid 19 Pandemic reinforced on mankind that if we go against nature, it will surely strike back. SARS-COV-2 was first identified in the city of Wuhan, Hubei, China in mid-December 2019[1]. India had the second-highest number of confirmed cases in the world with 44,676,318, and the third-highest number of COVID-19 deaths with 530,658 deaths[2], Daily cases peaked mid-September with over 90,000 cases reported per-day, dropping to below 15,000 in January 2021, Although COVID is a respiratory virus, there was an increases in the "UNUSUAL SITE THROMBOSIS" due to which a surgeon was often involved for a considerable amount of cases, involving peripheral vascular diseases, deep venous thrombosis, and increased events of bowel is ischemia too[3].

MATERIALS AND METHODS:

This study is retrospective analysis of the patients who were admitted in the COVID 19 referral center in the Sassoon General Hospital from the period of March 2020 to December 2020

All covid files were examined for :

- Documentation of local examination of extremities.
- Discoloration of limbs
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- CT peripheral angiography
- Referred patients for SMA thrombosis, intervention for thrombosis
- Amputations

- Events of deep venous thrombosis
- Superior mesenteric artery, superior mesenteric vein thrombosis presenting as abdominal pain due to Bowel Ischemia.


Fig 1 and 2 : Data collection

OBSERVATIONS :

OBSERVATIONS IN COVID 19 POSITIVE PATIENTS WITH FEATURES OF **ACUTE LIMB**

ISCHAEMIA(ALI) :

Patients records were first examined for clinical signs such as pain, swelling and discolouration and a Doppler report confirming limb ischemia.

- **Age and gender distribution:**

Age distribution	Number of people
36 to 45 years	1
46 to 54 years	1
55 to 64 years	5
65 to 74 years	2
75 to 84 years	1
86 to 95 years	1

Table 1 : Age distribution

Out of all COVID patients showing limb ischemia (11), 27% were females and the rest 73% were males.

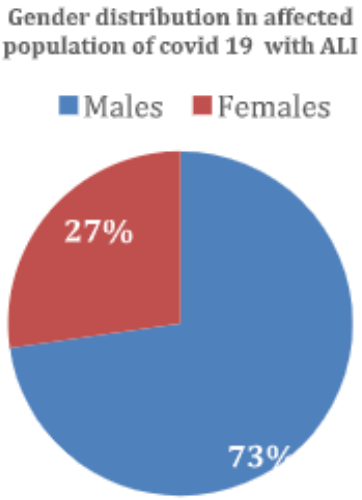


Fig 3 : Gender distribution

- **Vessels Involved in ALI**

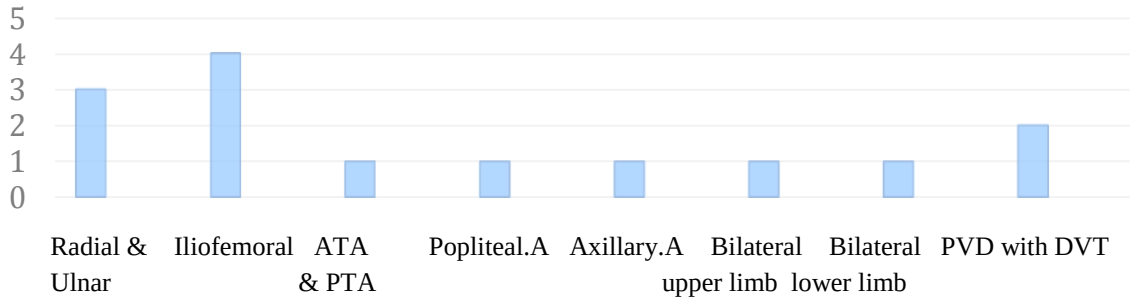


Fig 4: Vessels Involved

- **Inflammatory markers in ALI**

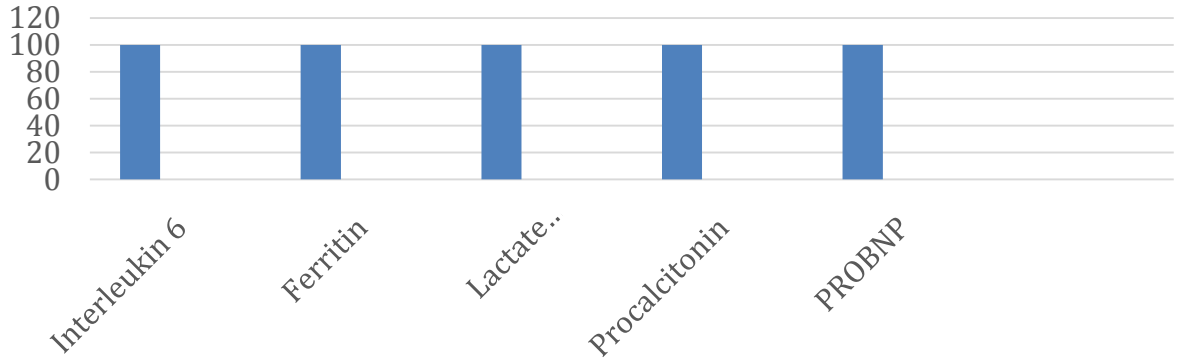


Fig 5: Inflammatory markers

- **Platelets in ALI**

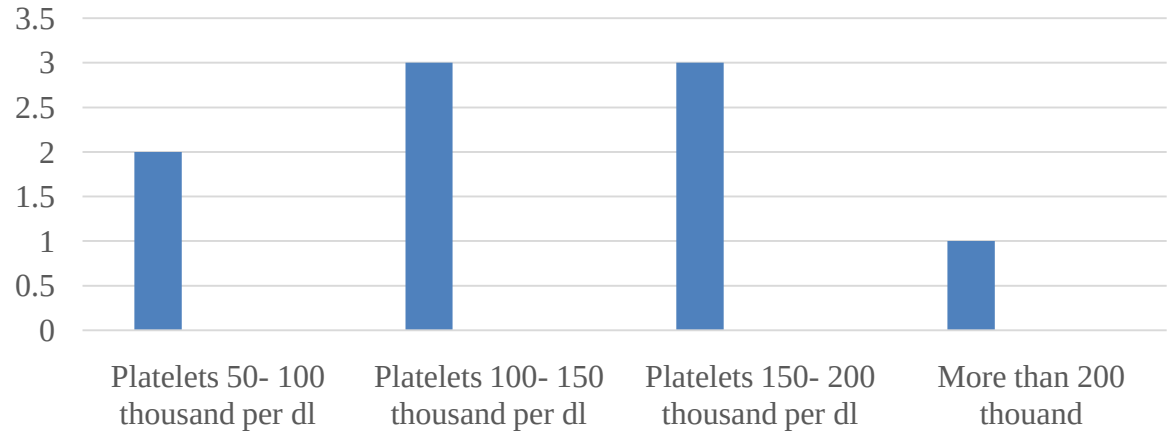


Fig 6: Platelets

Among all patients with ALI :

- 1 /11 underwent below elbow amputation
- 1 /11 underwent above knee amputation
- 10/11 succumbed to death
- All patients had elevated d dimer with normal range of PT-INR

OBSERVATIONS IN COVID 19 POSITIVE PATIENTS WITH FEATURES OF **DEEP VENOUS THROMBOSIS**

Patients records were first examined for clinical signs such as pain, swelling and discolouration and a Doppler report confirming deep venous thrombosis.

- **Age and Gender Distribution**

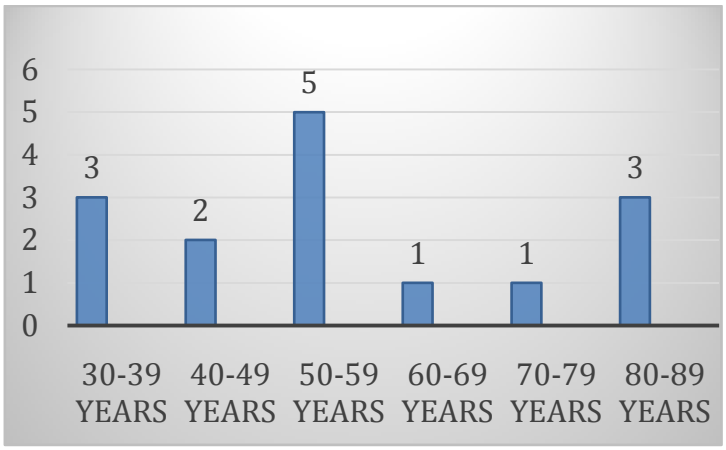


Fig 7

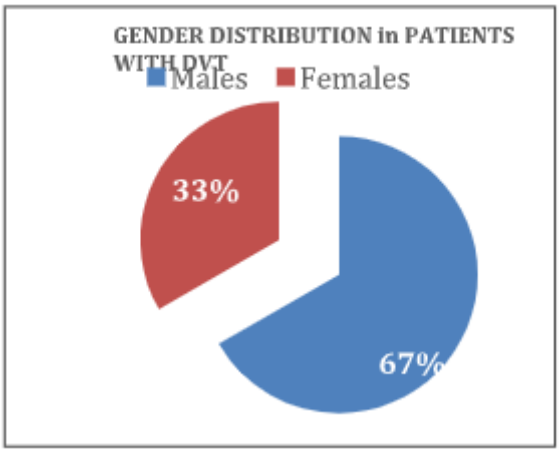


Fig 8

- **Inflammatory markers**

All inflammatory markers were found to be raised in DVT similar to ALI as shown in Fig 5

- **Vessels involved in DVT :**

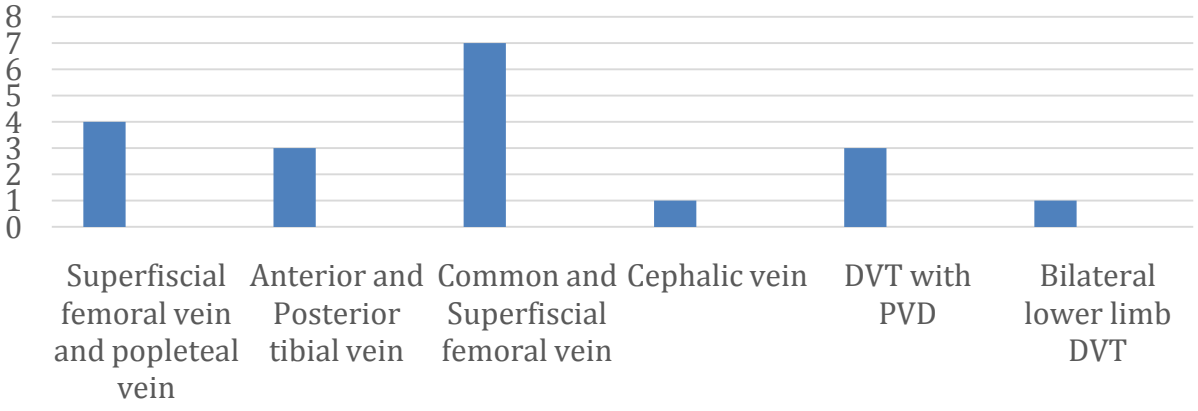


Fig 9

Table 2

Pts	Day of appearance	Total no. of days of admission
1	8th day	16 days
2	6th day	10 days
3	7th day	32 days
4	5th day	8 days
5	3rd day	10 days
6	3rd day	7 days
7	10th day	15 days
8	5th day	12 days
9	6th day	9 days
10	8th day	12days
11	3rd day	5 days
12	1st day	1 day
13	10th day	19 days
14	10th day	21 days
15	3rd day	5 days

- All the patients were on anticoagulant prophylaxis from day 1 of admission
- 4 out of 15 had Hypertension
- 6 out of 15 had Diabetes Mellitus
- All patients developed DVT after admission to the hospital with the mean presentation on **6±2.8 days (Table 2)**
- All patients had raise in all the inflammatory markers, elevated d dimer with normal range of PT-INR
- 13 out of 15 patients succumbed to death.

OBSERVATIONS IN COVID 19 PATIENTS WITH FEATURES OF **BOWEL ISCHMEIA**

- **Age distribution**

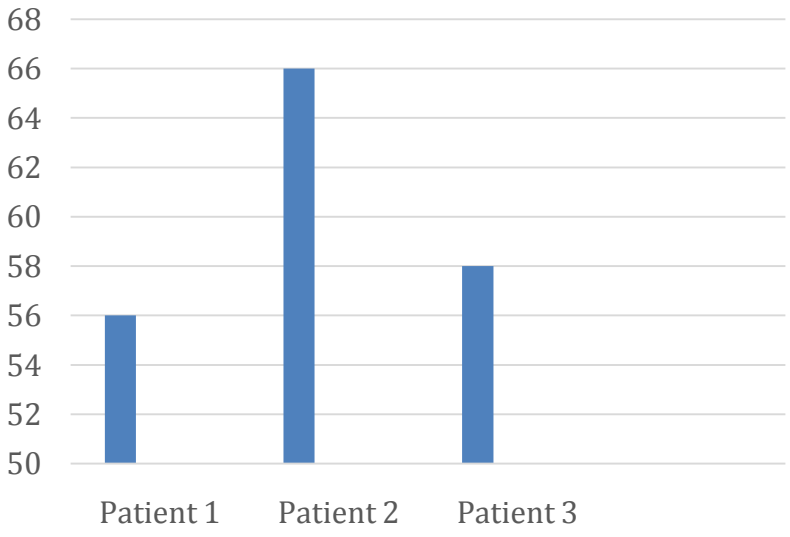


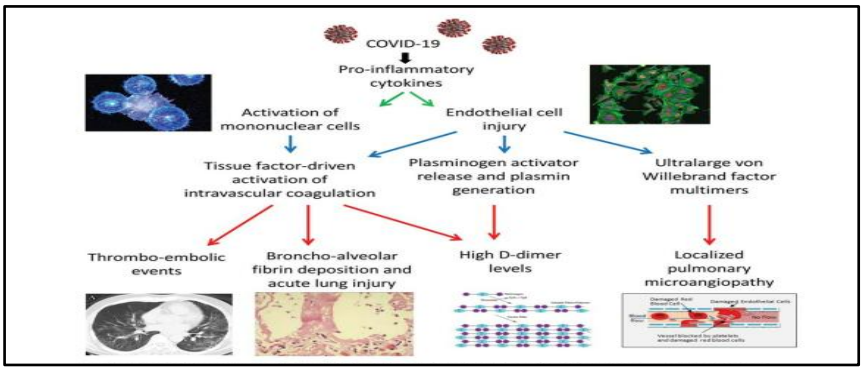
Fig 10

- All 3 patients had SMA thrombosis on the basis of CECT report
- All 3 patients were operated
- All 3 patients had elevated inflammatory markers with normal platelet levels
- All 3 patients succumbed to death on the first week of the post operative period

DISCUSSION:

COVID 19 associated coagulopathy:

Direct infection and resulting injury of endothelial cells by the virus. This results in a massive release of endothelial cell constituents, such as von Willebrand factor multimers, but also plasminogen activators which can lead to high levels of D-Dimer levels[4,5].



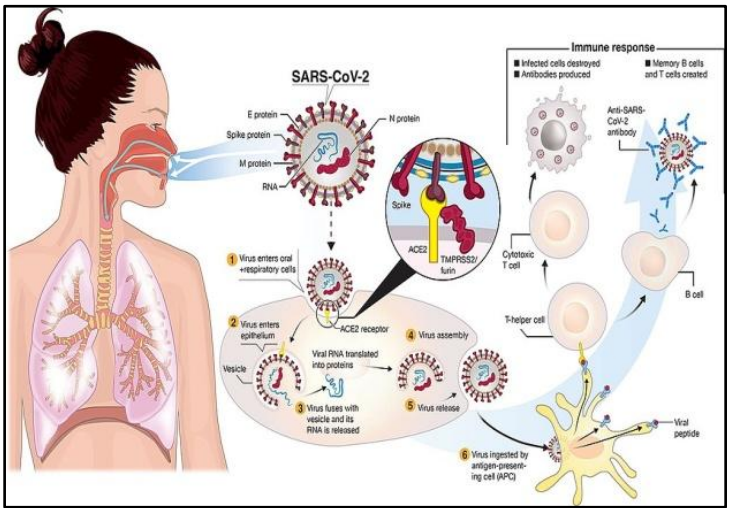


Fig 11 & 12: Pathogenisis of COVID 19 and Coagulopathy

Autopsies done in other studies revealed:[6,7,8,9,10]

- Damage to surface airway epithelial cells and Diffuse alveolar damage with hyaline membrane
- Microvascular fibrin thrombi in small pulmonary vessels
- IHC s/o CD3, CD4 and CD8 and numerous macrophages in areas of focal pneumonia
- Pulmonary thromboembolism and Haemorrhagic lung areas
- Large number of megakaryocites in pulmonary arteries
- 32 out of 80 deceased patients had fresh DVT in a post mortem study by *Elder et al*
- 17 out of 32 also had pulmonary artery embolism
- *Whichmann et a*l had an incidence of 58% of DVT in their study

Limitations of the study:

Prospective study would have been more beneficial. Most of the patients were not thoroughly evaluated by CT scan due to critical condtion of the patient, huge load and non availability of facilities to evaluate other areas of thrombosis. Great loss for the scientific community due to lack of early autopsy findings which could have changed the direction of early treatment.

CONCLUSION:

This pandemic of COVID19 affecting globally has cost us many lives, these needs to be understood and prevented. This study concludes that majority of the surgical complaints were due to the complication of thrombosis either in the venous system or arterial system with majority limb and life threatening, these needs to be suspected early and managed accordingly if the circumstances repeats again.

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