VASCULAR TRAUMA

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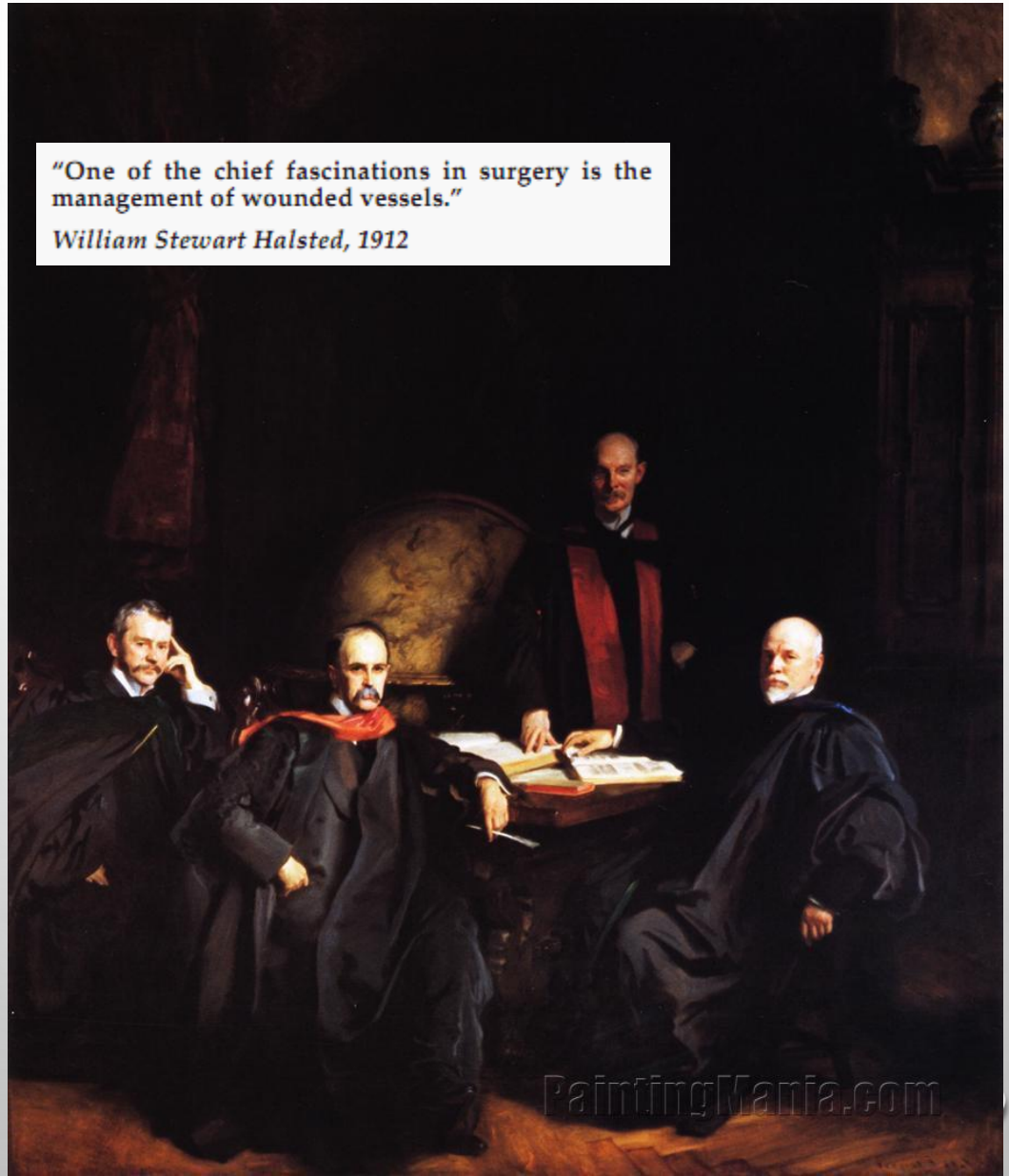
HISTORY


"One of the chief fascinations in surgery is the management of wounded vessels."
William Stewart Halsted, 1912
PaintingMania.com

INTRODUCTION

- PERIPHERAL INJURIES ACCOUNT FOR 80% OF ALL CASES OF VASCULAR TRAUMA.
- THE LOWER EXTREMITIES ARE INVOLVED IN 2/3 OF ALL PATIENTS WITH VASCULAR INJURIES.
- 90% -MALE

ETIOLOGY

- **GUNSHOT WOUNDS**-70-80%- NEED EXPLORATION
- **STAB WOUNDS** (5-10% OF CASES REQUIRE INTERVENTION)
- **BLUNT TRAUMA** (5-10% OF CASES): PRESENCE OF FRACTURE OR DISLOCATION INCREASES THE RISK.
- **IATROGENIC INJURY** (5% OF CASES):

1. ENDOVASCULAR PROCEDURES
2. CENTRAL LINE PLACEMENT

MECHANISMS

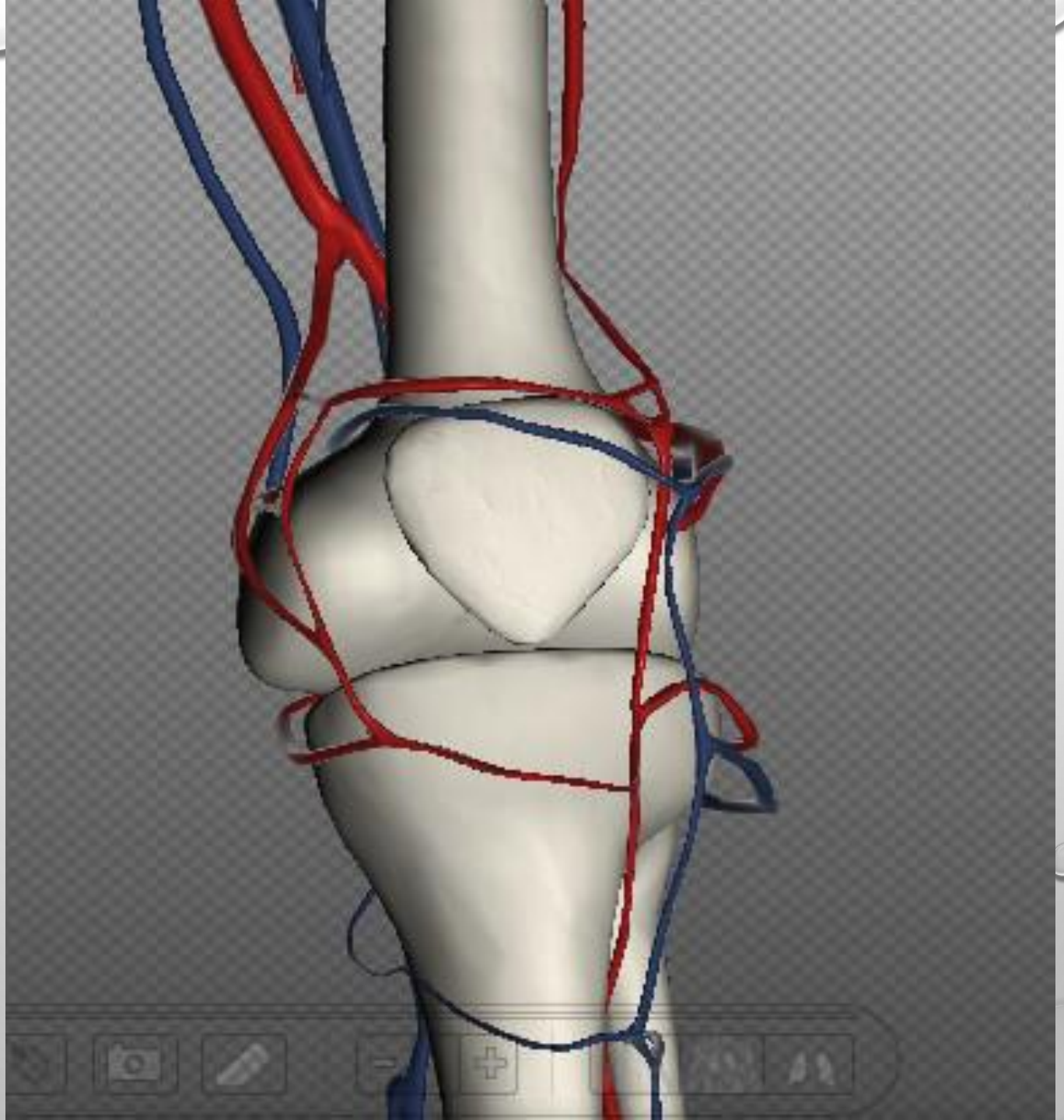
- **BLUNT**
- – ORTHOPAEDIC #
- – DISLOCATION (KNEE)
- – ISOLATED
- **PENETRATING**
- – HIGH VELOCITY
- – LOW VELOCITY
- **IATROGENIC**

6 PS

- PAIN
- PALLOR
- PULSELESS
- PARESTHESIA
- PARALYSIS
- PERISHING COLD

PROBLEMS WITH DIAGNOSING ISCHAEMIA AFTER TRAUMA

- **PAIN–** DUE TO INJURY ITSELF, MAY NOT HAVE PAIN DUE TO ASSOCIATED NERVE INJURY
- **PALLOR–** MAY BE PALE DUE TO BLOOD LOSS
- **ABSENT PULSE–** ABSENT DUE TO LOW BLOOD PRESSURE.
- **PARESTHESIA , PARESIS–** OCCUR DUE TO ASSOCIATED NERVE, MUSCLE INJURY OR
- **UNRESPONSIVE** CONFUSED PATIENT



HARD SIGNS

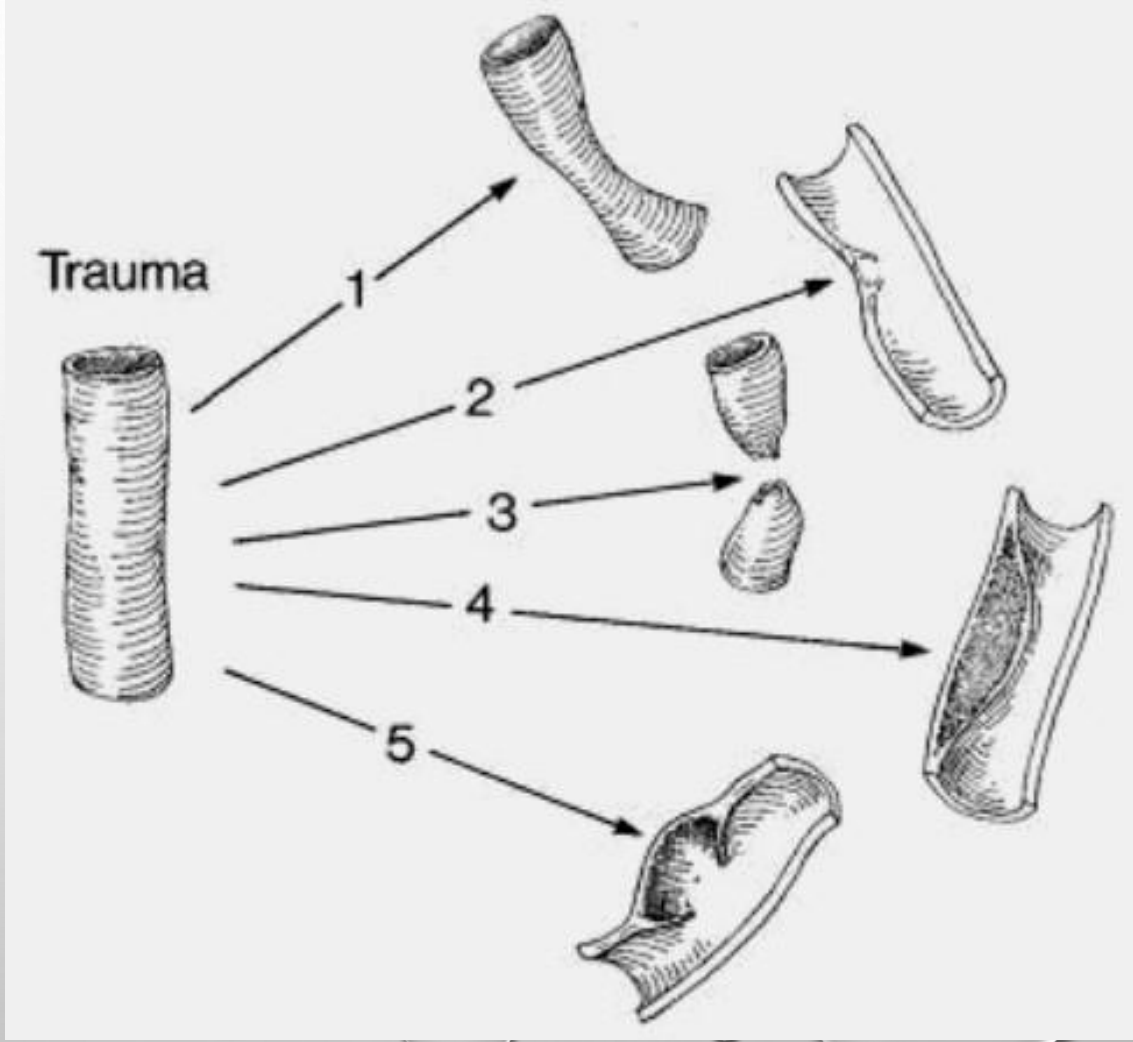
1. EXTERNAL (ARTERIAL BLEEDING)
2. RAPIDLY EXPANDING HAEMATOMA
3. PALPABLE THRILL/AUDIBLE BRUIT
4. OBVIOUS ISCHAEMIA- 5 P'S

INDEX OF SUSPICION -***SOFT SIGNS***

1. HISTORY OF ARTERIAL BLEEDING
2. PROXIMITY OF #/WOUND TO ARTERY
3. DIMINISHED PULSE (BP)
4. SMALL NON-PULSATILE HAEMATOMA
5. NEUROLOGIC DEFICIT

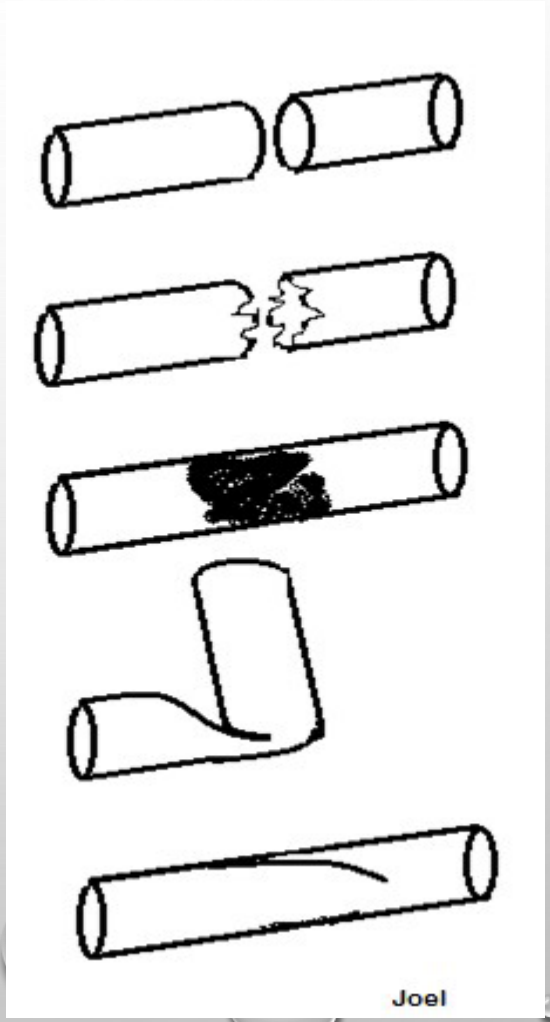
VASCULAR INJURY

1. SPASM (OR COMPRESSION)
2. INTIMAL INJURY
3. TRANSECTION
4. INTRAMURAL HEMATOMA
5. PSEUDOANEURYSM



MECHANISM OF DISRUPTION OF FLOW AT ARTERIAL LEVEL

- TRANSECTION
- • LACERATION
- • CONTUSION
- • KINK
- • INTIMAL FLAP



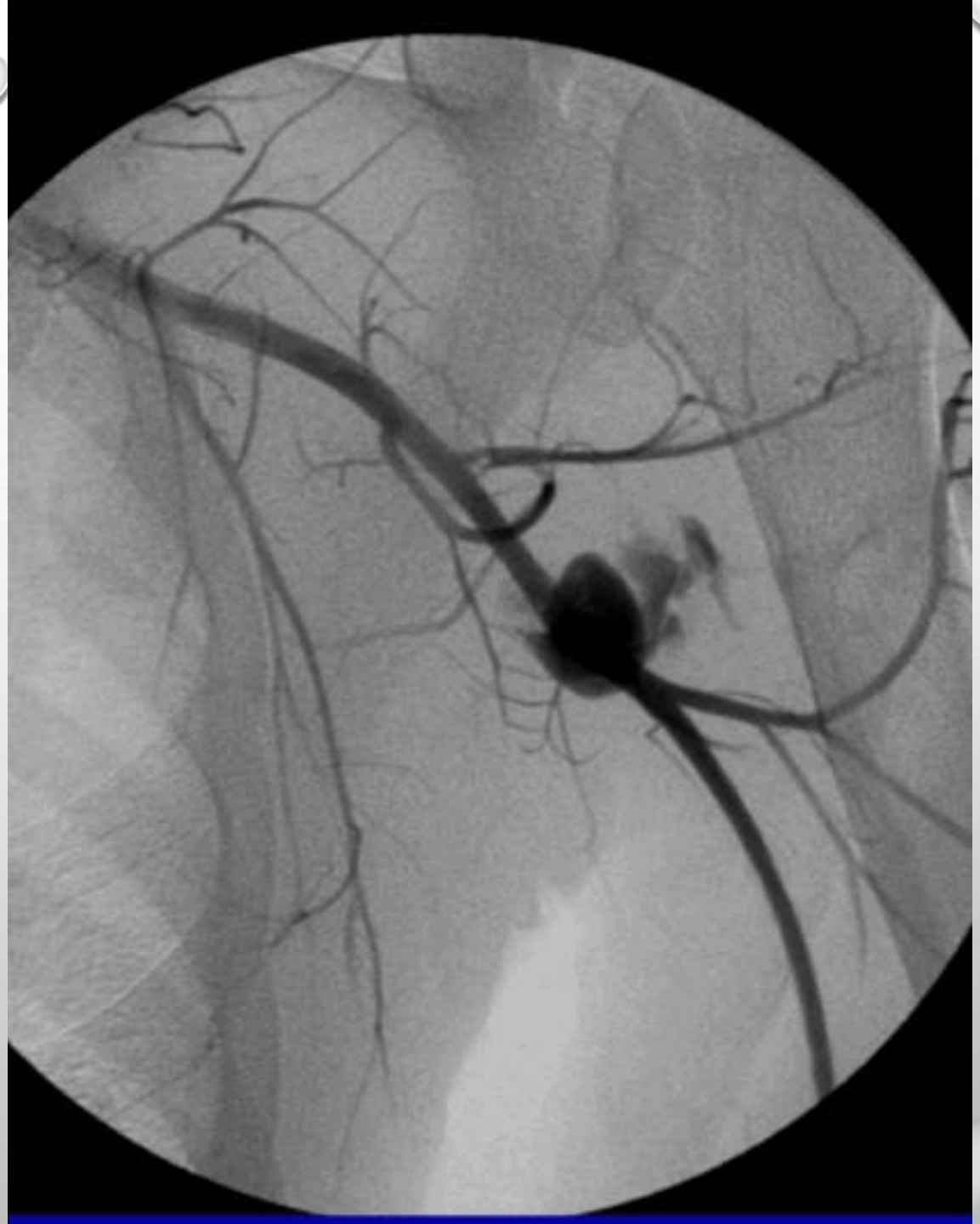
INITIAL ASSESSMENT-ABCDE

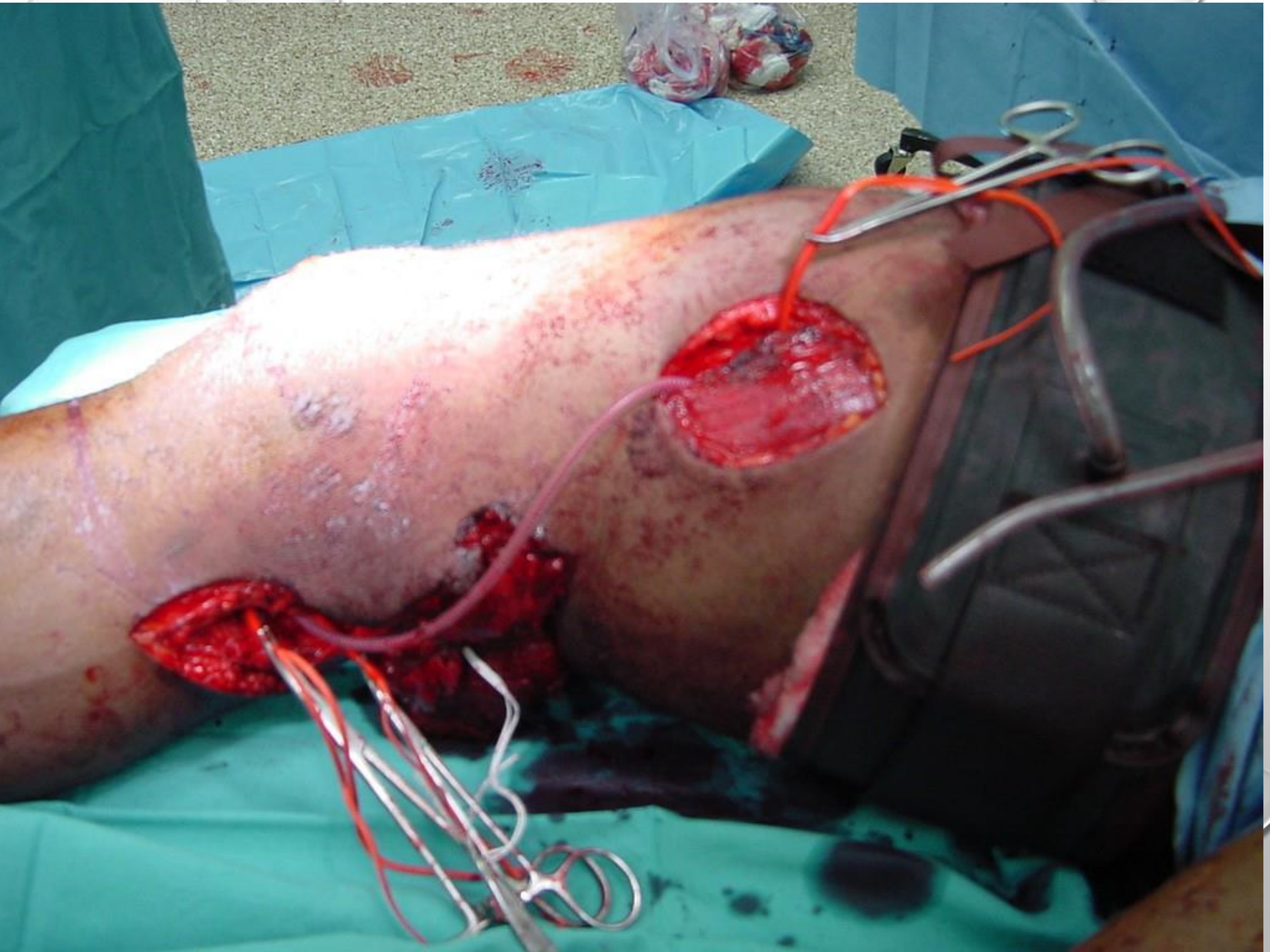
1. AIRWAY
2. BREATHING/VENTILATION
3. CIRCULATION
4. DISABILITY
5. EXPOSURE

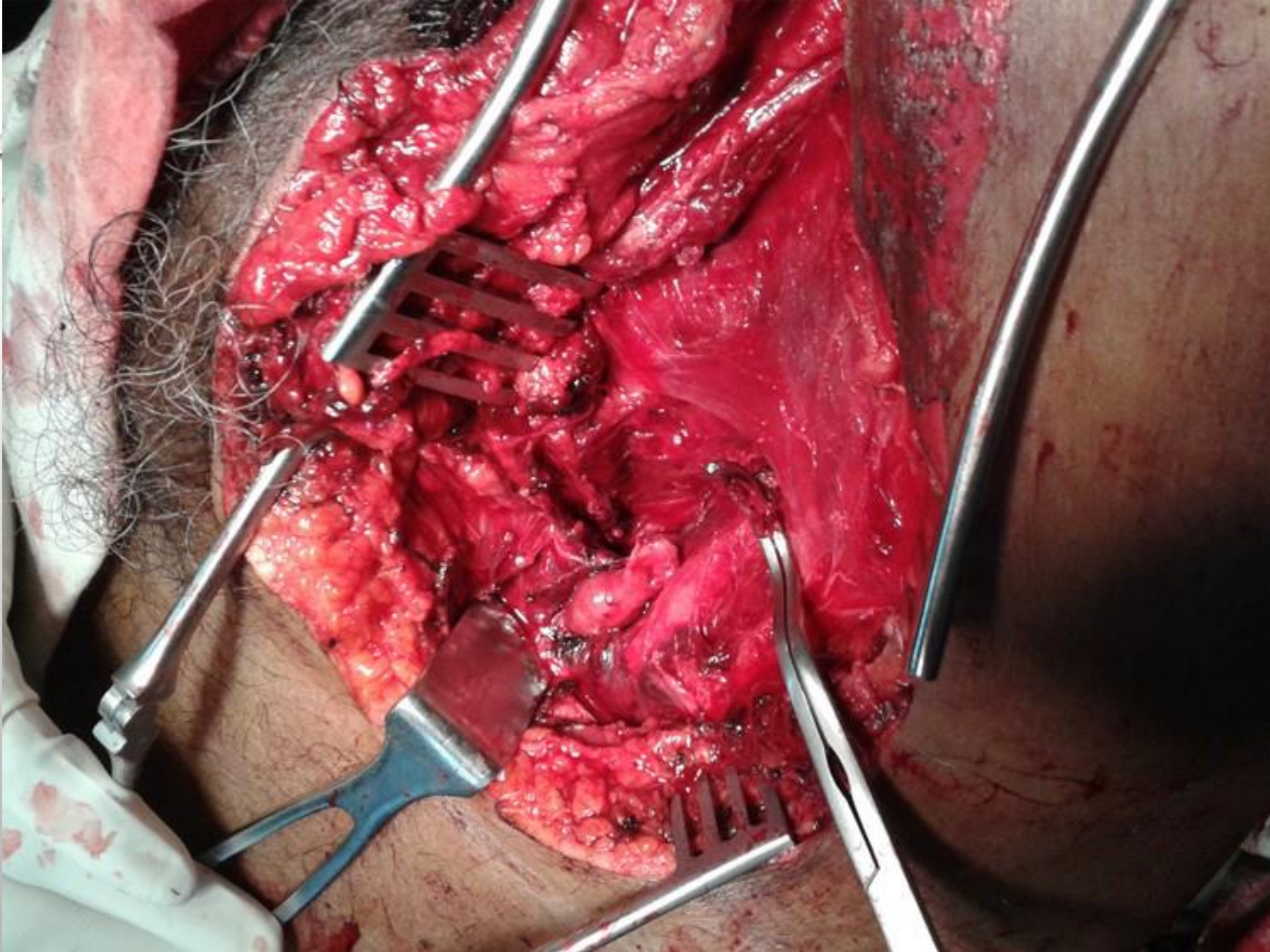
NO SIGNAL = NO PERFUSION

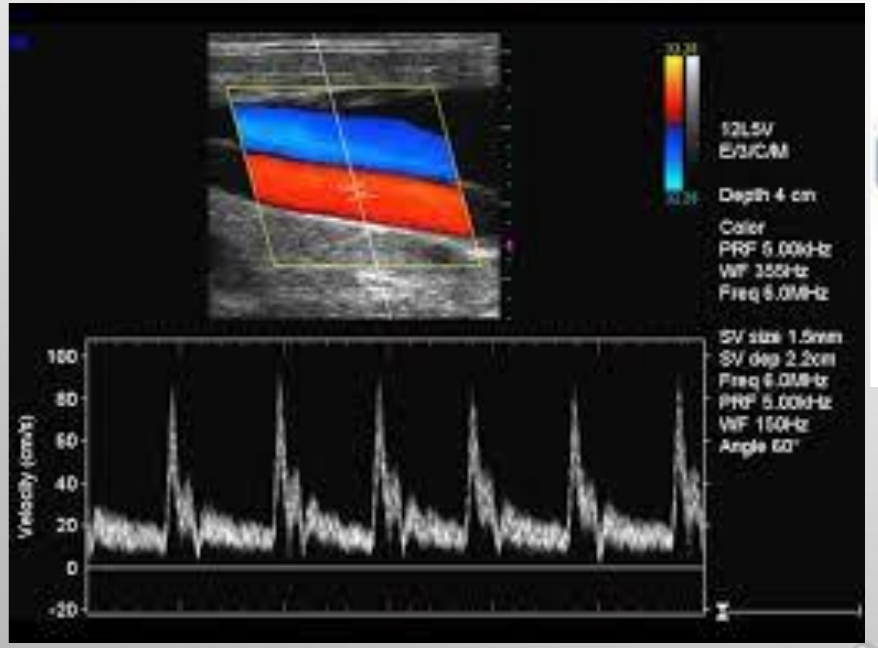
IMMEDIATE TREATMENT

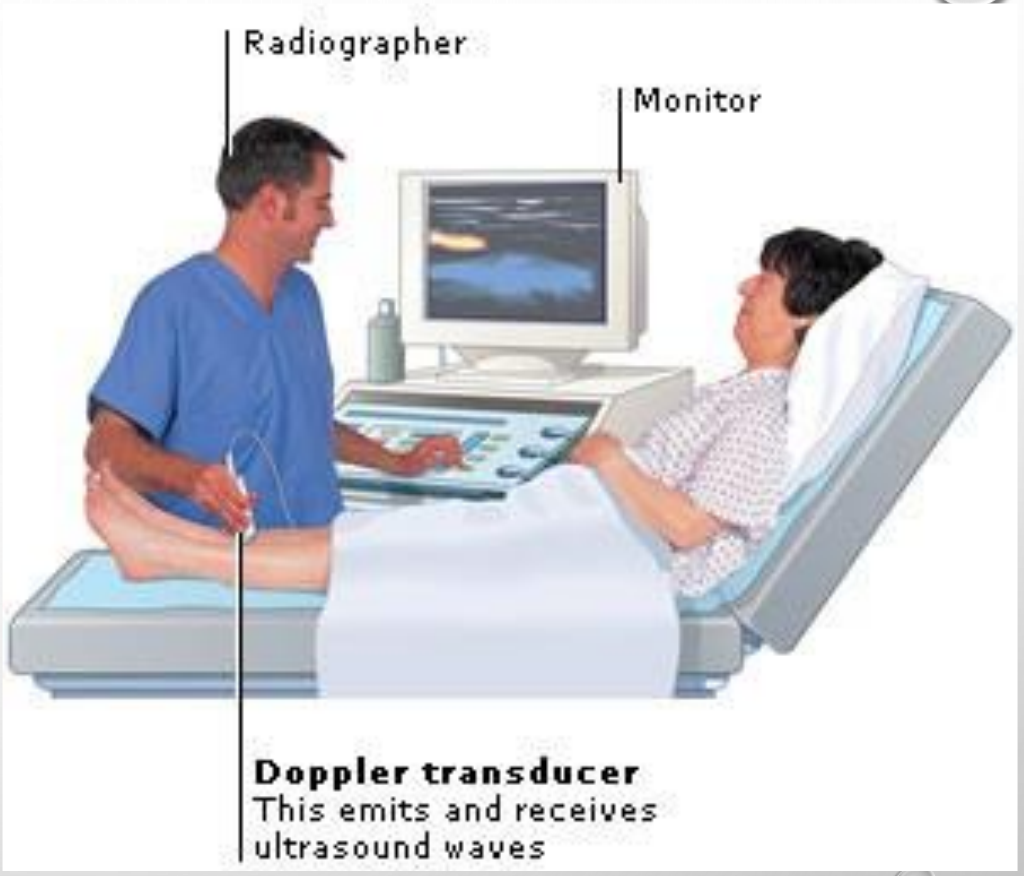
1. CONTROL BLEEDING
2. REPLACE VOLUME LOSS
3. COVER WOUNDS
4. REDUCE FRACTURES/DISLOCATION
5. SPLINT
6. RE-EVALUATE





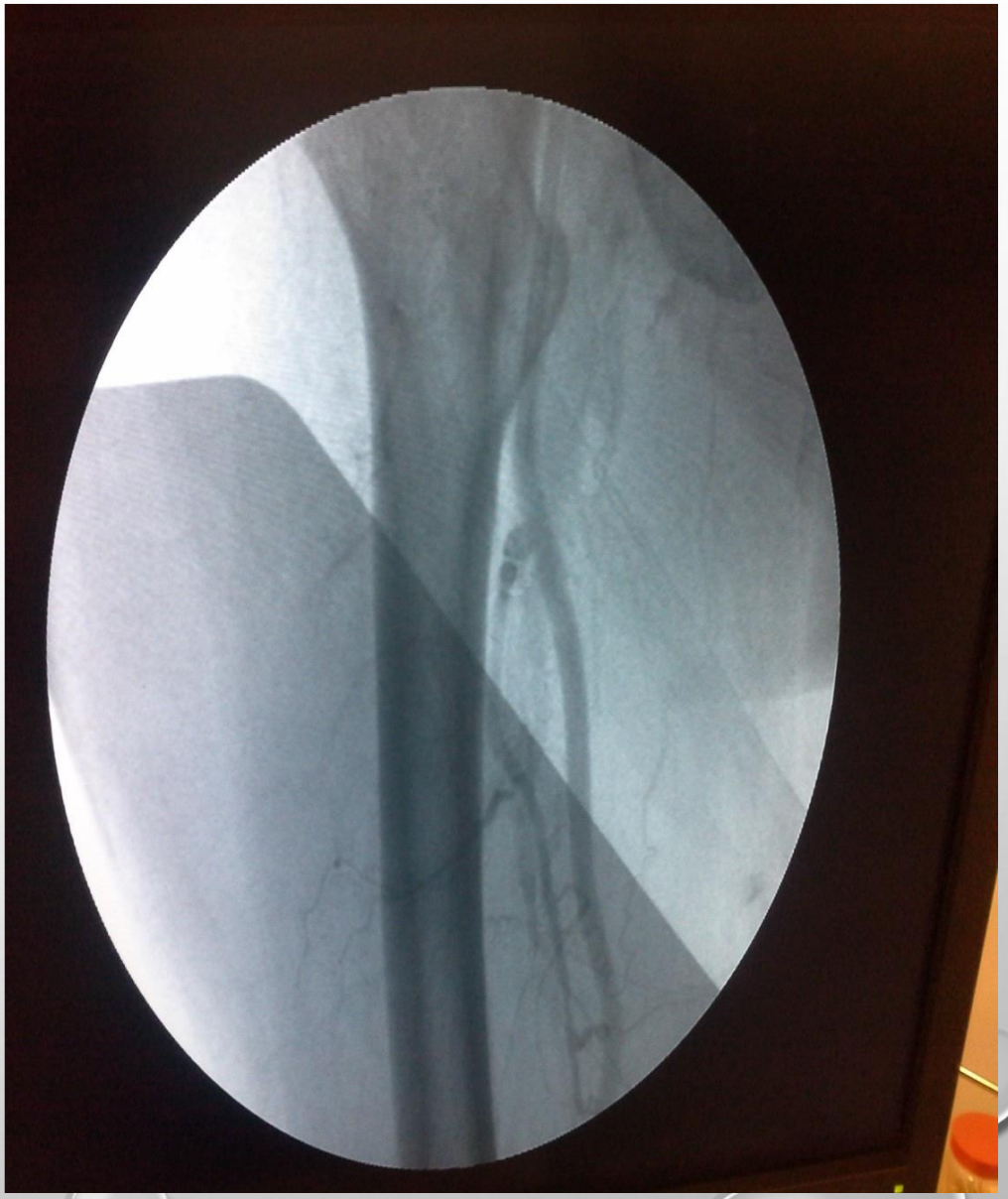



Depth 4 cm
Color
Velocity (cm/s)
100
80
60
40
20
0
-20

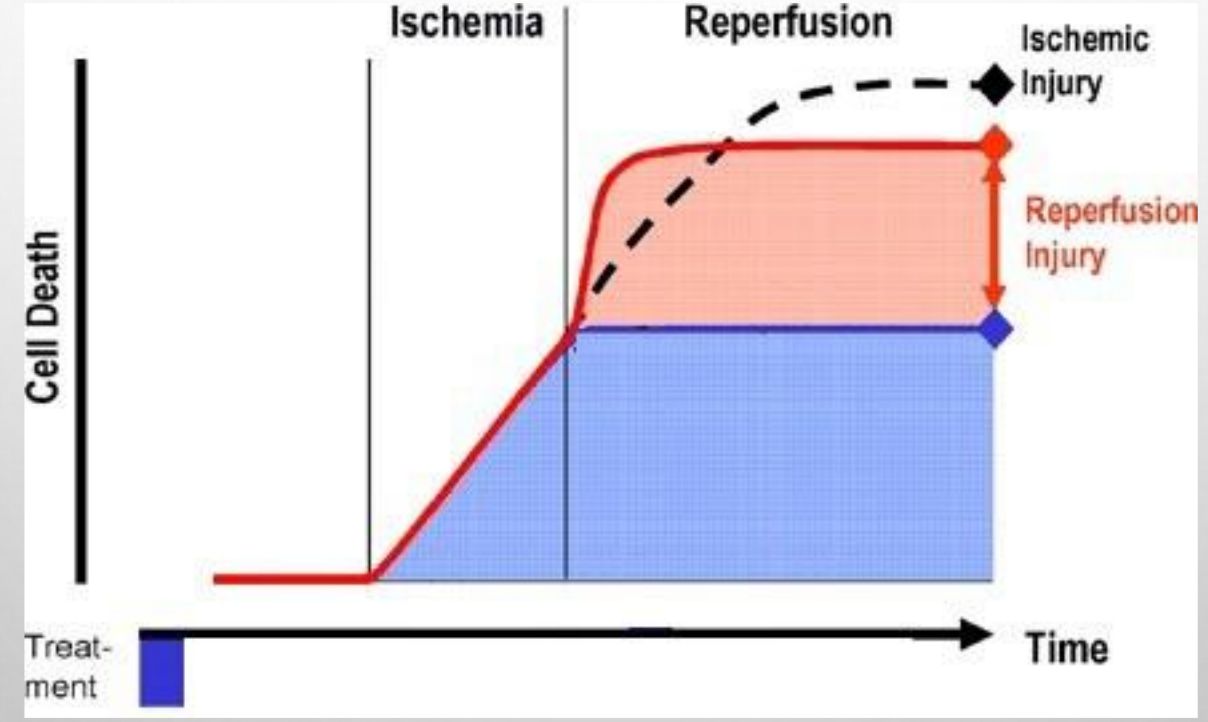

Radiographer
Monitor
Doppler transducer
This emits and receives ultrasound waves

INVESTIGATIONS

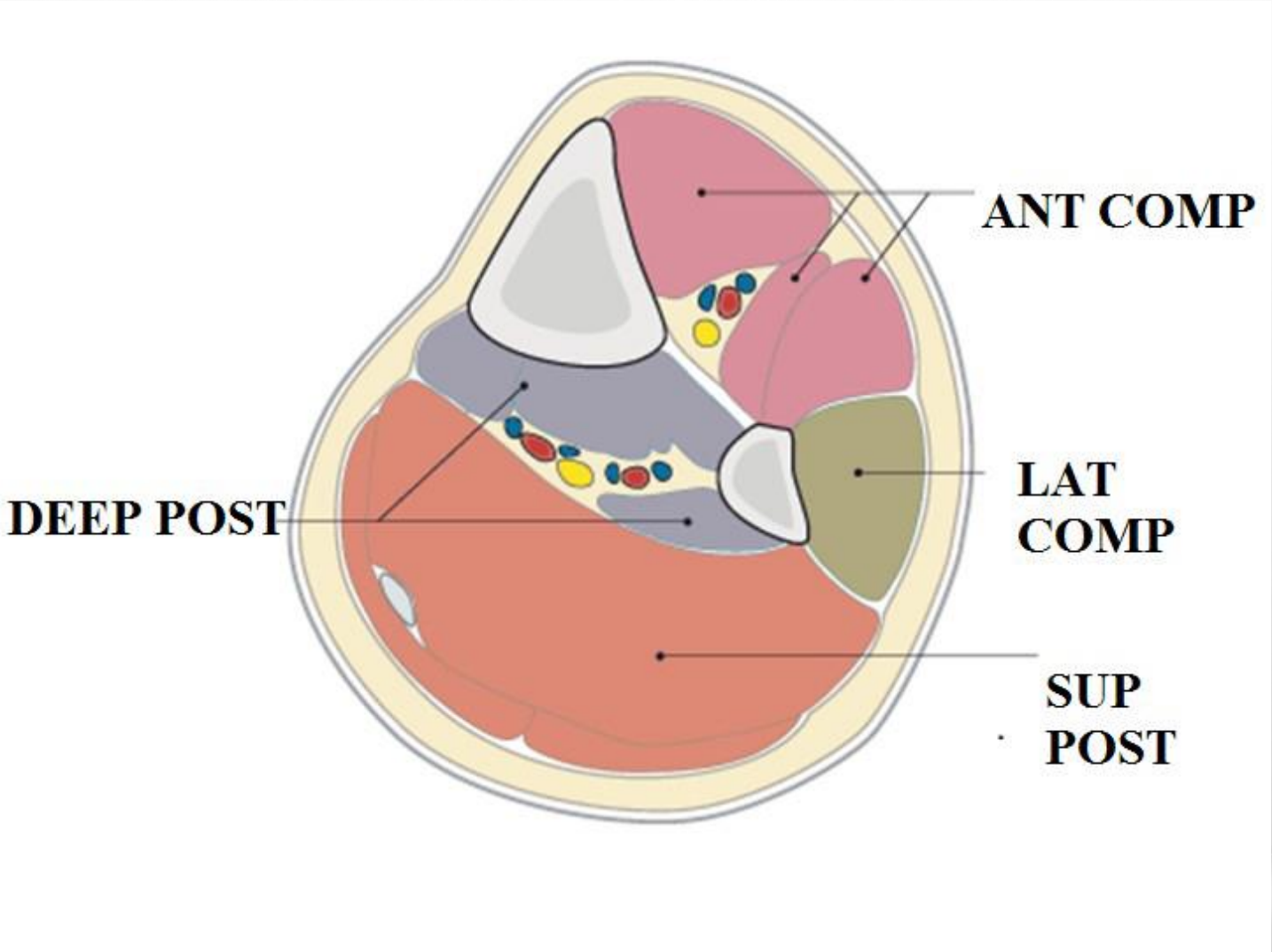
- Angiography
  - CT angiography
  - Catheter angiography



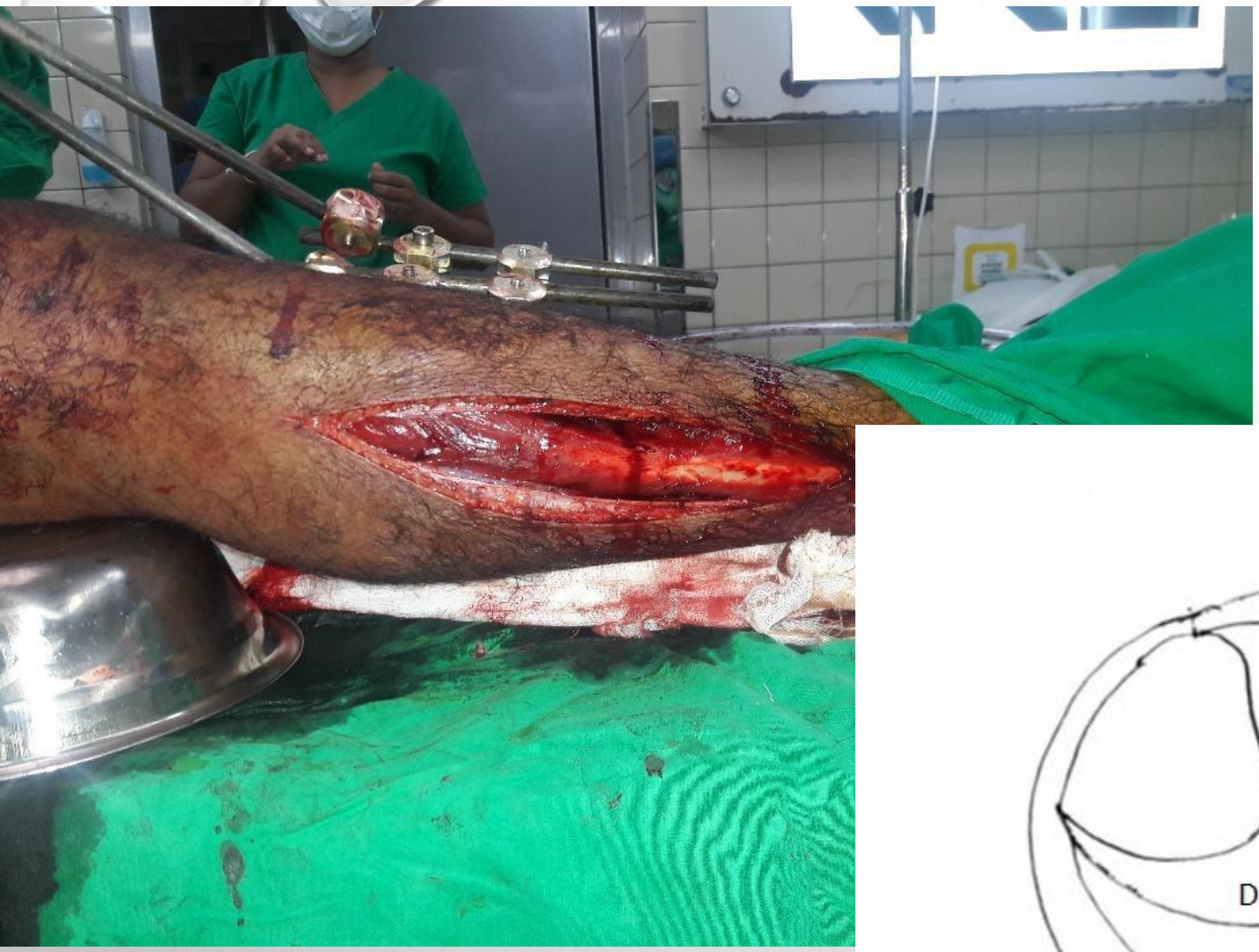
HOW SOON WE SHOULD WE REPAIR – AS SOON AS POSSIBLE – EFFECTS OF ISCHAEMIA

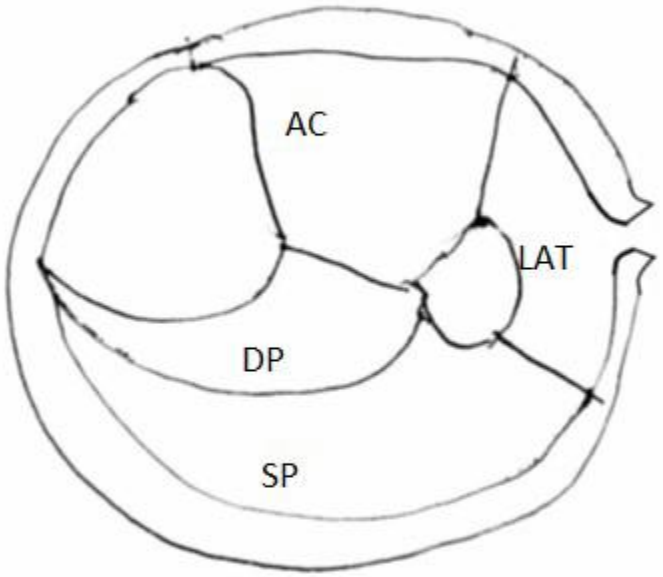


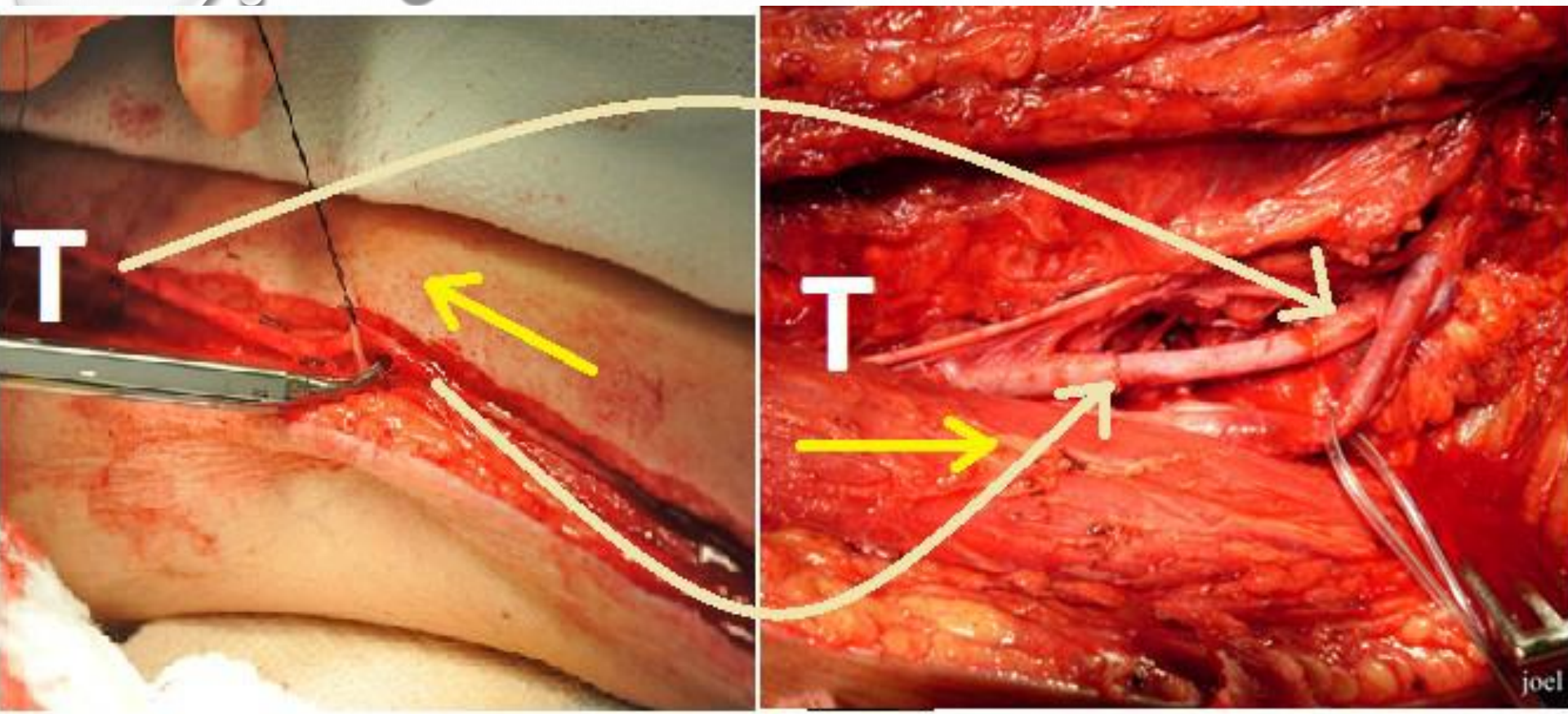
WHAT ARE THE LEG COMPARTMENTS



FASCIOTOMY




AC
LAT
DP
SP
Joel



REVERSED SAPHENOUS VEIN GRAFT (RSVG)

- POST PERFUSION EFFECTS
- • REPERFUSION INJURY
- • REPERFUSION SYNDROME

REPERFUSION EFFECTS

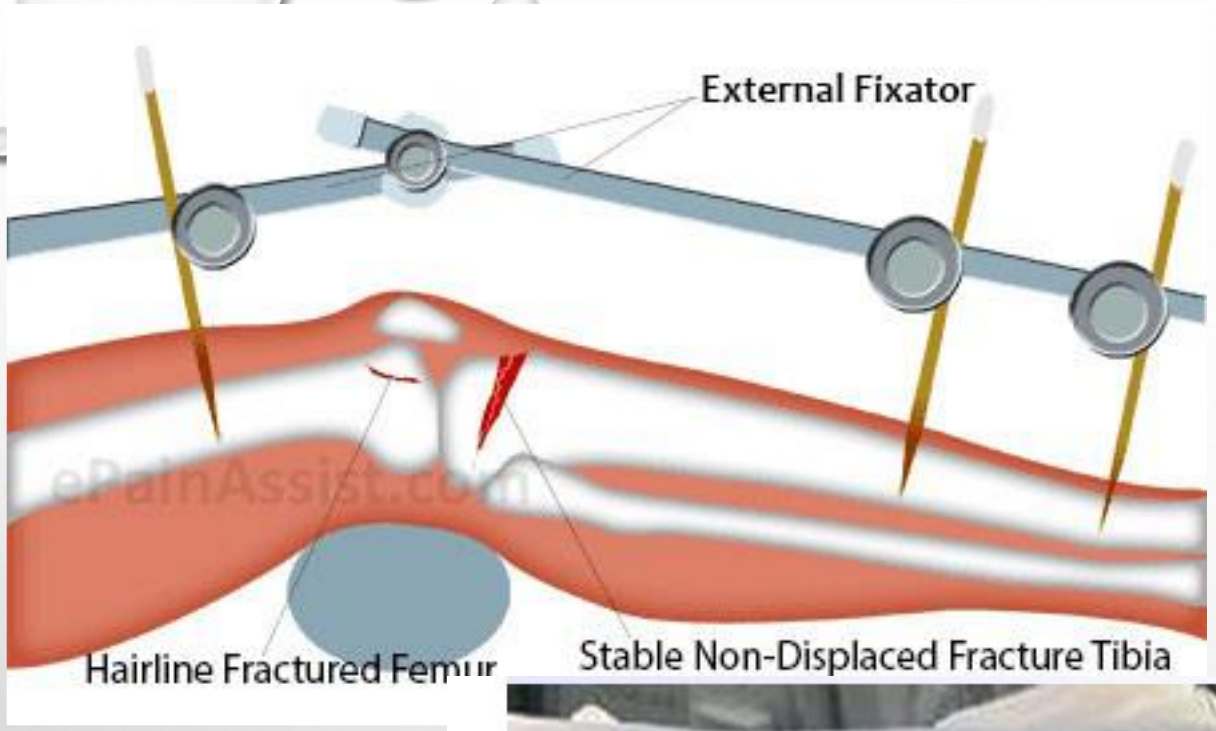
- **LOCAL** – REPERFUSION INJURY– PARADOXYCAL DEATH OF ALREADY DYING MUSCLES AFTER REPERFUSION
- **SYSTEMIC- REPERFUSION SYNDROME**

1. HYPOTENSION
2. ARDS
3. LACTIC ACIDOSIS
4. HYPERKALEMIA
5. RENAL FAILURE

- FASCIOTOMY
- HYDRATE THE PATIENT
- MANNITOL
- O2
- INOTROPES
- LIGATION OF VESSEL IF NOT RESPONDING TO ABOVE MESURES
- BICARBONATE DIURESIS

WHAT ELSE CAN WE DO

- COMPARTMENT EXCISION ?
- LIGATION
- AMPUTATION


External Fixator
Hairline Fractured Femur
Stable Non-Displaced Fracture Tibia

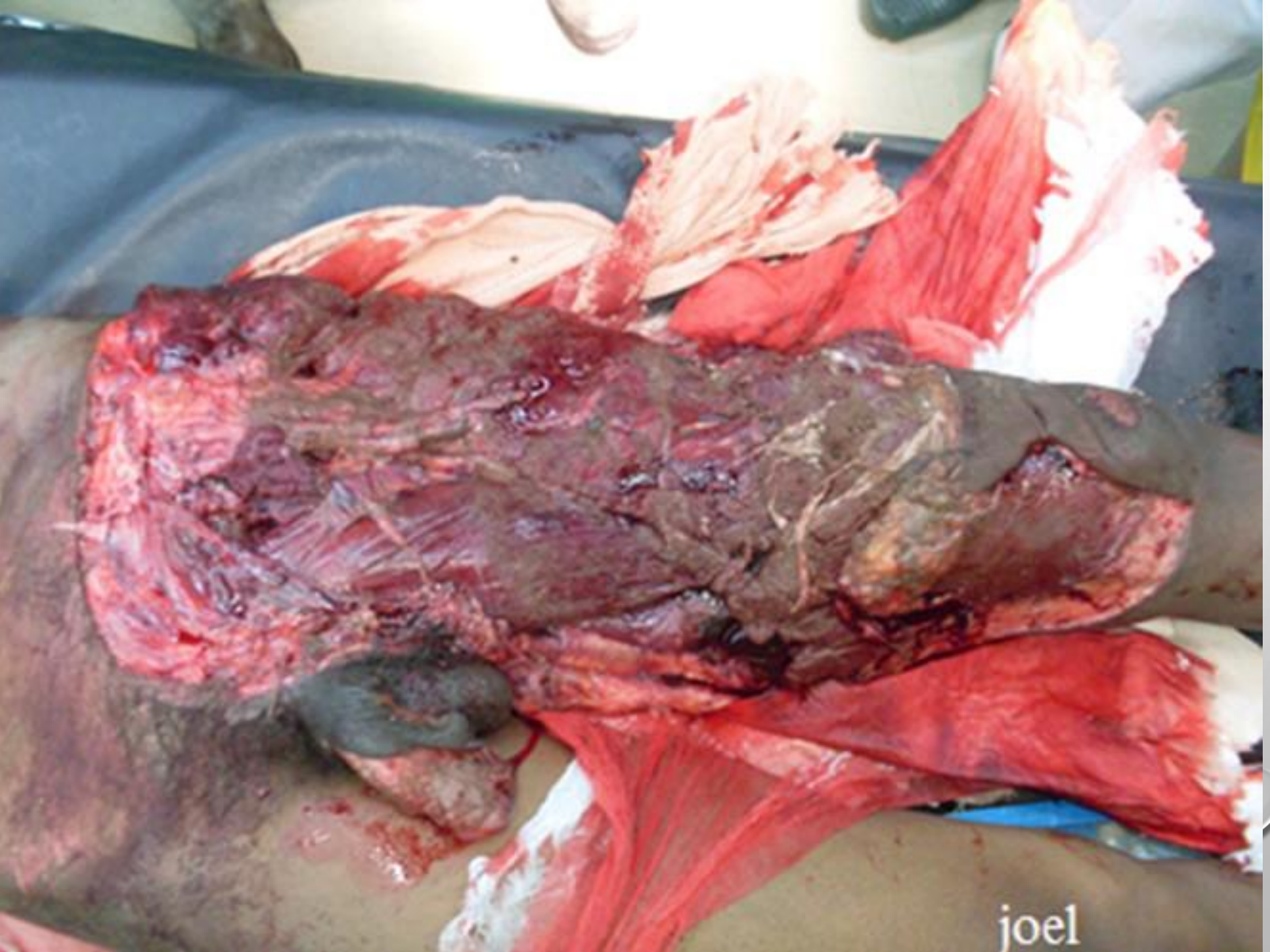
- **PRIMARY AMPUTATION**

- EXTENSIVE CRUSH INJURIES AND SOFT TISSUE DAMAGE – “MANGLED LIMB”
- NO NEED TO TRANSFER – DISCUSS / PHOTO

Mangled Extremity Severity Score (MESS Score)

Limb Ischemia for >6 Hours?	☐ Yes **Limb Ischemia Points x2**
Limb Ischemia	○ Reduced Pulse but Normal Perfusion +1 ○ Pulseless, Paresthesias, Slow Capillary Refill +2 ○ Cool, Paralysis, Numb/Insensate +3
Patient Age Range	○ <30 years old 0 ○ 30-50 years old +1 ○ 50 years old +2
Shock	○ SBP > 90 Consistently 0 ○ Hypotension Transiently +1 ○ Persistent Hypotension +2
Injury Mechanism	○ Low Energy (stab, gunshot, simple fracture) +1 ○ Medium Energy (dislocation, open/multiple fractures) +2 ○ High Energy (high speed MVA or rifle shot) +3 ○ Very High Energy (high speed trauma with gross contamination) +4
MESS Score	Click! points

A score >7 predicts a low likelihood of limb/extremity viability.


joel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- THANK YOU