Gangrene
Definition:

• DEATH WITH PUTREFACTION OF MACROSCOPIC PORTIONS OF TISSUE
• AFFECTS DISTAL PART OF A LIMB
• ALSO APPENDIX, SMALL BOWEL LOOP, GALL BLADDER, TESTIS
CAUSES OF GANGRENE

• ARTERIAL OBSTRUCTION ➔ THROMBOSIS, EMBOLI
  ARTERITIS, BUERGER’S DISEASE, RAYNUAD’S DISEASE

• DRUGS: THIOPENTONE

INFECTIVE: CARBUNCLE, GAS GANGRENE,
  FOURNIER’S GANGRENE

TRAUMATIC: DIRECT INJURY – KNIFE, BULLET
  CRUSHING INJURY, HEAT, IRRADIATION, ELECTRICAL
• PHYSICAL: CHEMICAL, BURNS, FROSTBITE
• VENOUS GANGRENE

CLINICAL FEATURES
• ABSENCE OF ARTERIAL PULSATION
• VENOUS RETURN
• CAPILLARY RETURN
• COLD
• LOSE OF FUNCTION
• COLOUR CHANGES: PALLOR, GREY, PURPLE
  FINALLY DARK BROWN, BLACK.
  DISINTEGRATION OF HB FORMATION OF Fe Sulphide
CLINICAL TYPES

- DRY GANGRENE -> DISICATION OF TISSUES DUE TO GRADUAL SLOWING OF BLOOD STREAM
- ATEROMATOUS OCCLUSION
- AFFECTED PART DRY, DISCOLOURED
• MOIST GANGRENE
• SUDDEN ARTERIAL OCCLUSION EMBOLUS
• VENOUS STASIS
• DIABETIC GANGRENE INFECTIVE
• OEDEMA
• DISCOLOURATION,BLEPS
• CREPITUS-GAS FORMING ORGANISMS
• GANGRENE OF BOWEL, APPENDIX
SEPARATION OF GANGRENE

- ZONE OF DEMARCATION-BETWEEN LIVING AND DEAD TISSUE
- A BAND OF HYPERAEMIA,HYPERAESTHESIA
- AREA OF GRANULATION TISSUE
- ULCERATION DEVELPTS IN DEAD TISSUE
DRY GANGRENE:

- PROXIMAL BLOOD SUPPLY IS ADEQUATE
- LINE OF DEMARCATION SHARP
- NO INFECTION
- FINAL SEPARATION WITHIN DAYS
- BONE INVOLVER, SEPARATION TAKES LONGER TIME, CONICAL SHAPE STUMP
MOIST GANGRENE

- INFECTION, SUPPURATION EXTENSIVE
- LINE OF DEMARCATION, MORE PROXIMAL, DIFFUSE
- SKIP AREAS: SPREADING OF GANGRENE PROXIMALLY
- DARK SKIN PATCHES

INFECTION CAUSES SPREAD OF GANGRENE
TREATMENT OF GANGRENE

- LIMB SAVING ATTITUDE
- ARTERIAL DISEASE – PTA, BYPASS GRAFTING
- AMPUTATION: CRUSH INJURY,
  SPREADING GANGRENE
  GAS GANGRENE
- CARDIAC CAUSES, ANEMIA, NUTRITION,
- CONTROL OF DIABETES, ANALGESICS
- EXPOSED LIMB KEPT DRY – FAN
- PROTECTION OF PRESSURE AREAS –
  HEEL, MALEOLI, WATER, AIR BEDS
- REMOVAL OF CRUST IMPROVE BLOOD FLOW
• DIABETIC GANGRENE
CAUSES
• PERIPHERAL NEURITIS-TROPHIC
• ATEROMA OF ARTERIES – ISCHEMIA
• HYPERGLYCEMIA – INFECTIONS
• LOSS OF SENSATION – MINOR TRAUMA
INFECTION, DEFORMITIES OF JOINTS
• MUSCLE INBALANCE, CALLOSITIES, NIDUS FOR
INFECTION, CHIROPODY-MCR CHAPPALS
• SPREADING OF INFECTION SUB FACIAL
PLANES, INVOLVING TENDONS, MUSCLE BONE
• INVESTIGATIONS
• BLOOD SUGAR, GLYCOSILATED Hb
• PERIPHERAL PULESSES – FEMORAL POPLITEAL DORSALIS PEDIS POST TIBIAL
• WOUND CULTURE
• DOPPLER STUDY
• DSA
• MRA
• TREATMENT
• DIABETES CONTROLLED
• ANTIBIOTICS
• WOUND CARE
• DEBRIMA – REMOVING INFECTED DEAD TISSUES,
• AMPUTATION - CONSERVATIVE
Gas Gangrene
Bacterial Infection
Clostridium Perfringens, c.novyi,c.septicum
Anaerobes,in soil,Gut
Alpha Toxis – Necrotizing, hemolytil
Common in war wounds, crush injuries
Gas composed of

H2 - 5.9 %
CO2 - 3.4 %
N2 - 74.5 %
O2 - 16.1 %
Figure 4. Gas gangrene developing after a compound fracture of the tibia and fibula. Note the necrotic skin and prominent bullae. Finegold et al, Anaerobic Infections, Upjohn 1972
Myonecrosis, oedema, pus thin
sweety odour – Lysis of WBCS
Hosts immune system decreasing
Incidence 1%
Symptoms: Sudden onset of pain, wc,
heaviness of limb, fever crepitus, tenderness,
Tachycardia, hypotension, shocks, ARDS
Gram Staining: Gram + Bacilli, no neutrophils

X-ray:
Gas in muscular plane CT scan 100% sensitive

Treatment

Antibiotic:
Pencillin G 10 – 24m.units clindamycin metronidazole

ICU Care

Hyperbaric oxygen therapy
100% o2 3 atmosphere
Surgical

Fasciotomy compartment syndrome
Debrima of wound
Amputation
TRAUMATIC GANGRENE

A. DIRECT

- LOCAL INJURY – CRUSH
- PRESSURE -> SPLINTERS, PLASTERS, BED SORE CRUSH INJURY – ACCIDENTS AMPUTATION

BED SORE CAUSES

1. PRESSURE
2. INJURY
3. ANEMIA
4. MALNUTRITION
5. MOISUTURE
• SPINAL INJURY – PARALYSIS
• CHRONIC ILLNESS – IMMOBILITY

PRE CAUTIONS

1. PADDING OF PRESSURE POINTS
   Ex. HEEL, MALLEOLI, SHOULDER
2. AIR BEDS
3. FREQUENT TURNING OF PATIENT
4. SKILLED NURSING – URINE MOTION
   OPSITE
BED SORE OCCURS ONCE DEVELOPS IT IS DIFFICULT TO MANAGE
PREVENTED AT ERYTHEMA STAGE
ULCER – MANAGED AS ELSEWHERE
HAEMOGLOBIN MAINTAINED
ROTATIONAL SKIN FLAP CONSIDERED
INDIRECT TRAUMATIC GANGRENE

• FRACTURES OF LIMB
• TRAUMTIC THROMBOSIS OF ARTERY
• LOCAL ANAESTHESIA WITH ADRENALINE
• TORNI
This image displays a well-defined, superficial decubitus ulcer.
TREATMENT
1. REDUCTION FIXATION OF FRACTURES
2. DIRECT ARTERIAL REPAIR
3. LIVE SAVING AMPUTATION

DRUG ABUSE

- ARTERIAL INJECTION OF DRUGS
- FEMORAL ARTERY INVOLVED
- IF PULSES ARE ABSENT, ANGIOGRAM, INTRA ARTERIAL THROMBOLYSIS, HEPARIN, DEXTRON
- RECOVER WITH CONSERVATIVE TREATMENT
• BRACHIAL ARTERY INJECTION – THIOPENTONE
SEVERE SPASM – 2% PAPAVERINE / HEPARIN
• BRACHIAL BLOCK
• DEXTRAN LMW

FROST BITE

• EXTREME COLD – HIGH ALTITUDE
• ELDERLY
• DAMAGE TO VESSEL WALL
• OEDEMA
• SEVERE PAIN, LATER WAXY PAINLESS LIMB
• BLISTERS, GANGRENE
• TREATMENT
• WARMING GRADUALLY
• REST TO LIMB
• ANALGESICS
• CONSERVATIVE AMPUTATION

TRENCH FOOT

CAUSES
ILL FITTING SHOES
COLD, DUMPING CONDITIONS
MUSCULAR INACTIVITY
NUMBNESS, THEN PAIN
SKIM MOTTLED, BLISTERS, GANGRENE
AINHUM

- UNKNOWN AETIOLOGY
- BLACK MALES- AFRICA
- FISSURE DEVELOP IP JOINT OF TOE 5th
- FIBROUS BAND DEVELOP ENCIRCLE THE TOE – NECROSIS
- Treatment
- 2- PLASTY
- AMPUTATION
ERGOT

- COMMON IN MEDITERRANEAN RUSSIAN
- BREAD INFECTED WITH CLAVICEPS PURPUREA
- MIGRAINE PATIENTS – LONG DURATION
- FINGERS, NOSE EARS
THANK YOU