WOUND INFECTION
HISTORY

EGYPTIANS – PREVENT PUTREFACTION – MUMMIFICATION
HIPPOCRATIC TEACHINGS – WINE & VINEGAR – IRRIGATION OF INFECTED WOUNDS
GALEN – ABCESS – DRAINAGE – RECOVERY
AMBROISE PARE : CLEAN WOUNDS CLOSED PRIMARILY HEALED
KOCH POSTULATES :
a. Micro Organism considerable number
b. It should be cultured from focus
c. Must produce similar lesion injected into another host

ANTI SEPTIC TO ASEPTIC TECHNIQUE

GNAC AUSTRIAN OBSTETERICIAN – HAND WASHING REDUCED Puerperal Sepsis

LOUIS PASTEUR : MICRO ORGANISM
LISTER: ANTI SEPTICS

MODERN: ASEPTIC TECHNIQUE OT

ANTIBIOTIC / CHEMOTHERAPY

ALEXANDER FLEMING – PENICILLIN

- NATURAL DEFENSES

INTACT EPITHELIAL SURFACE – SURGERY, TRAUMA
LOW GASTRIC Ph

ANTIBODIES, OPSONINS

PHAGOCYTIC CELLS, MACROPHAGES, KILLER LYMPHOCYTES

- CAUSES REDUCES RESISTANCE

METABOLIC DIABETES, MALNUTRITION, JAUNDICE, UREMIA
DISSEMINATED DISEASE CANCER, AIDS

IATROGENIC RADIOTHERAPY CHEMOTHERAPY STEROIDS

POOR PERFUSION SHOCK, LOCAL ISCHEMIA

FOREIGN BODY

POOR SURGICAL TECHNIQUE – HEMATOMA

OPPORTUISTIC INFECTION

IMMUNOLOGICALLE COMPROMISED

NORMAL FLORA – NORMALLY NON PATHOGENIC

BEHAVES AS PATHOGENS
PROPHYLACTIC ANTIBIOTIC

- DECISIVE PERIOD – 4 HR
- TIME TAKEN FOR HOST DEFENCES TO BECOME ACTIVE

LOCAL AND SYSTEMIC

- SSSI: SUPERFICIAL SURGICAL INFECTION
- SEPSIS: SYSTEMIC MANIFESTATION
- SIRS: SYSTEMIC INFLAMMATORY RESPONSE SYNDROME
- ENDOTOXIN RELEASE GRAM NEGATIVE BACILLI
- CYTOKINES – INTERLEUKINS / TNF, HYPERTHERMA, TACHYCARDIA,
- WBC →
- MODS: MULTIPLE ORGAN DYSFUNCTION SYNDROME

MSOF

SOURCE OF INFECTION

PRIMARY: ACQUIRED FROM ENDOGENOUS COMMUNITY

SECONDARY: NOSOCOMIAL, WARDS, THEATRE
<table>
<thead>
<tr>
<th>GRADE</th>
<th>APPEARANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Normal healing</td>
</tr>
<tr>
<td>1</td>
<td>Normal healing with mild bruising or erythema</td>
</tr>
<tr>
<td>1a</td>
<td>Some bruising</td>
</tr>
<tr>
<td>1b</td>
<td>Considerable bruising</td>
</tr>
<tr>
<td>1c</td>
<td>Mild erythema</td>
</tr>
<tr>
<td>II</td>
<td>Erythema plus other signs of inflammation</td>
</tr>
<tr>
<td>II a</td>
<td>At one point</td>
</tr>
<tr>
<td>II b</td>
<td>Around sutures</td>
</tr>
<tr>
<td>II C</td>
<td>ALONG WOUND</td>
</tr>
<tr>
<td>II d</td>
<td>AROUND WOUND</td>
</tr>
<tr>
<td>------</td>
<td>--------------</td>
</tr>
<tr>
<td>III</td>
<td>CLEAR OR HAEMOSEROUS DISCHARGE</td>
</tr>
<tr>
<td>III a</td>
<td>At one point only (≤2 cm)</td>
</tr>
<tr>
<td>III b</td>
<td>Along wound (&gt; 2 cm)</td>
</tr>
<tr>
<td>III c</td>
<td>Large volume</td>
</tr>
<tr>
<td>III d</td>
<td>PROLONGED (&gt;3 days)</td>
</tr>
<tr>
<td>Major complication</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>PUS</td>
</tr>
<tr>
<td>IV</td>
<td>AT ONE POINT ONLY (≤2 cm)</td>
</tr>
<tr>
<td>IV b</td>
<td>ALONG WOUND (&gt;2 cm)</td>
</tr>
<tr>
<td>V</td>
<td>DEEP OR SEVERE WOUND INFECTION WITH OR WITHOUT TISSUE BREAKDOWN HAEMATOMA REQUIRING ASPIRATION</td>
</tr>
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## ASEPSIS – WOUND SCORE

<table>
<thead>
<tr>
<th>CRITERION</th>
<th>POINTS</th>
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</thead>
<tbody>
<tr>
<td>ADDITIONAL TREATMENT</td>
<td>0</td>
</tr>
<tr>
<td>ANTIBIOTICS FOR WOUND INFECTION</td>
<td>10</td>
</tr>
<tr>
<td>DRAINAGE OF PUS UNDER LOCAL ANAESTHESIA</td>
<td>5</td>
</tr>
<tr>
<td>DEBRIDEMENT OF WOUND UNDER GENERAL ANAESTHESIA</td>
<td>10</td>
</tr>
<tr>
<td>SEROUS DISCHARGE</td>
<td>DAILY 0-5</td>
</tr>
<tr>
<td>ERYTHEMA</td>
<td>DAILY 0-5</td>
</tr>
<tr>
<td>PURULENT EXUDATE</td>
<td>DAILY 0 – 10</td>
</tr>
<tr>
<td>SEPARATION OF DEEP TISSUES</td>
<td>DAILY 0-10</td>
</tr>
<tr>
<td>ISOLATION OF BACERIA FROM WOUND</td>
<td>10</td>
</tr>
<tr>
<td>STAY AS IN PATIENT PROLONGED OVER 14 DAYS AS RESULT OF WOUND INFECTION</td>
<td>5</td>
</tr>
</tbody>
</table>
**TYPES OF INFECTION**

WOUND ABCESS

**CLINICAL CELSUS:**
- CALOR – HEAT
- RUBOR – REDNESS
- ROMAN SURGEON TUMOUS – SWELLING
- LOSS OF FUNCTION
- ORGANISM – S. AUREUS
- PUS – NECROTIC TISSUES
  - WBC’S
  - SURROUNDED BY PYOGENIC MEMBRANE
  - FIBRINOUS EXUDATE
  - OEDEMA
  - CELLS OF INFLAMATION
• GRANULATION TISSUE
• FIBROBLASTS, ANGIogenesis, MACROPHAGES, COLLAGEN DEPOSITION
• ANTI BIOMA: STERILISED ABCESS CAVITY

- ABCESS:
  7 – 9 DAYS TO FORM
  HYPER OSMOLAR MATERIAL DRAWS FLUID
  PAIN
  TRACK DOWN TO SKIN
  DRAINED AND CLEAN, LOCULI OPENED
  CHRONIC ABCESS – SINUS OR FISTULA FORMATION
  CALCIFICATION – TUBERCULOSIS
  ACTINOMYCES
• DEEP SEATED ABCESS
• ANASTA MOTIC LEAKAGE
• PLEURA, PERITONEUM
• USG, CT – SCAN, MRI, ISOTOPE SCAN
• GUIDED ASPIRATION
• DRAINAGE AND CURETTAGE
• ANTIBIOTICS
• SECONDARY SUTURING

❖ CELLULITIS AND LYMPHAGITIS

• NON SUPPURATIVE INFECTION OF TISSUES
• POOR LOCALISATION
• BL HAEMOLYTIC STREPTOCOCCI, STAPHYLOCCOCI
• RELEASES STREPTOKINASE
  HYLURODINASE
  TOXEMIA – CHILLS, FEVER, RIGOR
• LYMPHAGITIS – PAINFUL RED STREAKS
• ENLAGED PAINFUL NODES
• SYSTEMIC MANIFESTATIONS

❖ BACTERAEMIA AND SEPTICEMIA

RARE IN SUPERFICIAL INFECTION
OCCUS WHEN INSTRUMENTATION OF INFECTED
BILIARY OR URINARY TRACT
PROSTHESIS
SEPTICEMIA : ANASTAMOTIC LEAK

- MSOF
- BACTERIA TRANSLOCATION FROM GUT
- GRAM NEGATIVE B.CICCI
SPECIFIC WOUND INFECTION

GAS GANGERENE

• C. PERFRINGENS
• GRAM POSITIVE, SPORE BEARING BACILLI
• SOIL, FAECES
• WAR WOUNDS, COLORECTAL SURGERY
• DIABETIC, MALIGNANT DISEASE
• NECROTIC WOUND WITH FOREIGN MATERIAL
• WOUND PAIN, CREAPTUS GAS IN TISSUES
• THIN, BROWN, SWEET SMELLING EXUDATE
• COLLAGENASE, HYALURONIDASE
• ALPHA - TOXINS
• MSOF
• PROPHYLACTIC ANTIBIOTICS
• LARGE DOSE OF PENICILLIN
• WOUND DEBRIDEMENT
- **NECROTISING FACILITIS**
  - NOT CAUSED BY CLOSTRIDIA
  - MIXED, STAPHYLOCOCCI, BACTEROIDS, STREPTOCOCCI
  - MELENEY’S GANGERENE – ABDOMINAL WALL
  - FOURNIER’S GANGRENE – SPREADING OF INFECTION
  - DIABETES
  - SUB DERMAL SPREAD
  - ANTIBIOTICS EXTENSIVE WOUND DEBRIDEMENT

- **BACTERIA INVOLVED IN WOUND INFECTION**

**STREPTOCOCCI**
- GRAM POSITIVE, PHARYNX S- 10 %
- LANSFIELD – A
- CELLULITIS
- STREPTOKINASE
- S. FAECALIS – D
- PENICILLINS
STAPHYLOCOCCI
- GRAM POSITIVE, CLUMPS
- S. AUREUS – NASOPHARYNX 15%
- MRSA – CARRIERS
- SENSITIVE TO VANCOMYCIN, FLUCLOXACILLINE
- STAPHYLOCOCCI ALBUS – COMMONSAL
- PROSTHESIS, PLATES etc
- RESISTANT TO MOST ANTIBIOTCS

CLOSTRIDIA
- GRAM – POSITIVE, SPORE BEARING
- OBLIGATE ANAEROBE
- GAS GANGRENE – C. PERFRINGENS
- TETANUS – C. TETANI
  EXO TOXIN, TETANOSPASMIN
  MUSCLE SPASM – TREATMENT
AEROBIC GRAM NEGATIVE BACILLI
- COMMONSAL LARGE GUT
- E-COLI, KLEBSIELLA, PRTEUS
- AFTER BOWEL SURGERY
- PSEUDOMONAS – UTI, BURNS, TRACHEOSTOMY
- DIFFICULT TO ERADICATE
- NEW QUINOLONES, MEROPENEM

BACTERIOIDES
- NON – SPORE BEARING, ANAEROBES
- B. FRAGILIS
- COLORECTAL, GNAECOLOGICAL
- METRONIDAZOLE, CEFOTAXIME

PRINCIPLES OF ANTIBIOTIC TREATMENT
- GIVE ANTIBIOTIC IN THE DECISIVE PERIODS
- SPREADING INFECTION, SYSTEMIC MANIFESTATION
- PARENERAL ANTIBIOTICS
- ORGANSIM AND SENSITIVITY TESTED
ANTIBIOTICS USED IN WOUND INFECTION

- PENICILLINS
- FLUCLOxacillin, METHICILLIN
- MEZLOCILLIN, AZLOCILLIN
- CEPHALOSPORINS
- AMINOGLYCOSIDES
- VANCOMYCIN
- IMIDAZOLES AND QUINALONES