**Definition**

“The science of the disease which can be demonstrated in human and animal remains of ancient times.”

Sir Marc Armand Ruffer, 1913

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**Paleopathology**

- Traumatic Lesions
- Artificial Intervention
- Neoplastic Lesions
- Metabolic Lesions
- Degenerative Lesions
- Congenital Abnormalities
- Infectious Lesions
- Inflammatory Lesions

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**Methods**

- Gross Findings
- Rehydration
- Microscopic Findings: Dissecting Light Electron Scanning Electron
- Serological Studies
- Chemical Studies

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**Postmortem??**

- Trauma fracture

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**Fracture patterns**

- Transverse
- Oblique
- Spiral
- Comminuted
Perry’s & Collies Fractures

Artificial Intervention

Cradle Boarding - Peru -

Tumpline deformation

Tumpline deformation

TrepAnation

Incomplete

Healing
Modern TrepAnationS

Decoration
Pre- and Post-Mortem

False Teeth
Peruvian skull with agate teeth

Surgical Repair

Neoplastic Lesions

<table>
<thead>
<tr>
<th>Age</th>
<th>Benign Lesions</th>
<th>Malignant Tumors</th>
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<tr>
<td>0-10</td>
<td>simple bone cyst</td>
<td>Ewing's sarcoma</td>
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<td>40 &amp; up</td>
<td>osteoma</td>
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</table>
Giant Cell Tumors

Types of Tumors

Osteoma

Multiple Myeloma

Metabolic Lesions
- Vitamin & Mineral Deficiencies
- Toxic Intakes
- Generalized Stress Indicators
- Childhood Stress Indicators

Vitamin Deficiencies
- Vitamin D deficiency
- Epiphyseal stunting
- Softened bones
**Gout**

- Uric acid crystals

**Porotic Hyperostosis**

- Diploe thickening
- Iron deficiency part of syndrome

**General stress indicators**

- Enamel hypoplasias
- Harris lines

**Congenital Lesions**

- Gigantism
- Hydrocephaly
- Club Foot
- Achondroplasia
- Spina bifida
Spina bifida Occulta

Infectious Lesions
- Trepanematosis
  Treponema pallidum, T. pertineu
- Tuberculosis
  Mycobacterium tuberculosis
- Leprosy
  Mycobacterium leprae

Treponemal Disease
Syphilis, Yaws, Fajal

Worldwide Distribution

Soft Tissue
Tuberculosis

Treponematosis

Pathogenesis
Mycobacterium tuberculosis
Treponema pallidum; Treponema pertenue

Mode of Infection
Respiration, aspiration
Skin contact

Modal Age at Infection
Early childhood
Early childhood

Topical to Generalized - Lesions

Lesion Distribution
Skin, mucous tissues
Lungs, lymph nodes

Bone Lesions
Mucous tissues, bone

Mortality Potential
High
Low

Information courtesy of Mary Lucas Powell, Ph.D.
Leprosy

Hansen’s Disease
*Mycobacterium leprae*

70% in India, Myanmar, & Nepal

**Periostitis**

**Inflammatory Lesions**

**Rheumatoid Arthritis**
Degenerative Lesions

- Osteoarthritis
- Osteoporosis/Osteopenia
- “Occupational Stress”

osteoArthritis
- Most common form of arthritis
- Joint pain, cartilage degeneration, osteophytes
- Repeated microtrauma to articular cartilage
- Little inflammation of synovial lining
- Degenerative, not inflammatory
- Also called DJD

Etiology of osteoArthritis

Normal load on abnormal joint
Abnormal load on normal joint
Genetic defect in cartilage
Excessive load injury
Result
Joint pain disability
Loss of articular cartilage
Bony remodeling

Degenerative Joint Disease

Osteophytosis
Osteoporosis vs. Osteopenia

Bone mineral density cut-off points for osteopenia and osteoporosis.

Age-related bone loss.
Differential Diagnosis ??