Spinal Infections

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History

• 7000 B.C.  TB Prehistoric Man
• 3000 B.C.  Egyptian Mummies
• 400 B.C.  Hippocrates
• 1779 A.D.  Percy Pott - Pott’s Paraplegia
Treatment

• Until 1911  Rest & Fresh Air

• 1911  First Surgical Decompression (Albee et al)

• 1945  TB Drugs

• 1956  Ant. Decompression & Strutt Graft (Hodgson & Stock)
Vertebral Circulation
Intervertebral Disc Circulation

**ADULT** ➔ **Avascular (Unless degenerative)**

**CHILD** ➔ **End Plate & Annulus**
Pathophysiology

- Haematogenous
  - Venous
  - Arteriolar

- Direct Innoculation
  - Surgery
  - Investigations
  - Trauma
Epidemiology & Bacteriology

Gram +ve 68%
Gram -ve 30%

Brucellosis
Fungi
Tuberculosis

Staph. Aureus 57%
E. Coli 10%
Proteus 7%
Pseudomonas 6%
Salmonella 1%

Geographical
Complications

- Septicaemia
- Soft Tissue Spread
- Epidural Abscess
- Meningitis
- Subdural Abscess
- Intramedullary Abscess
- Paralysis
Paralysis Risk Factors

- ↑ Age
- Staph. aureus Infections
- More Cephalad Infection
- Rhematoid Arthritis
- Diabetes Mellitus
- Immunocompromised e.g. Steroid Therapy
## Classification

<table>
<thead>
<tr>
<th>Anatomic Location</th>
<th>Area/Structure Involved</th>
<th>Terminology</th>
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<tbody>
<tr>
<td>Anterior spine</td>
<td>Vertebral body</td>
<td>Vertebral osteomyelitis</td>
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<tr>
<td></td>
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<td>Spondylodiscitis</td>
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<td></td>
<td>Intervertebral disc</td>
<td>Spondylitis</td>
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<td></td>
<td>Paravertebral space</td>
<td>Tuberculous spondylitis, Pott’s disease</td>
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<td>Discitis</td>
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<td>Paravertebral abscess</td>
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<td>Psoas abscess</td>
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<td>Retropharyngeal abscess</td>
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<td>Mediastinitis, empyema</td>
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<td>Superficial wound infection</td>
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<td>Infected seroma</td>
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<td>Deep wound infection</td>
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<td>Paraspinous abscess</td>
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<td>Posterior spine</td>
<td>Subcutaneous space</td>
<td>Osteomyelitis, deep wound infection</td>
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<td>Subfascial space</td>
<td>Epidural abscess</td>
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<td>Meningitis</td>
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<td>Subdural abscess</td>
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<tr>
<td>Spinal canal</td>
<td>Posterior elements</td>
<td>Intramedullary abscess</td>
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<tr>
<td></td>
<td>Epidural space</td>
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<td>Meninges</td>
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<tr>
<td></td>
<td>Subdural space</td>
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<td>Spinal cord</td>
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</tbody>
</table>
Four Main Groups

- Vertebral Osteomyelitis
- TB
- Discitis Childhood
- Post Op. Infections
Vertebral Osteomyelitis

(+ Spondylodiscitis)
Clinical Presentation

- Fever 52%
- Pain 90%
- SLR +ve [Lumbar Involvement]
- Delayed diagnosis
Site

Cervical 6.5 %

Thoracic 35 %

Lumbar 48 %
Investigation

- W.C.C. - often normal
- E.S.R. - best indicator
- Plain Films - 2/3 week lag
- Patch Test - T.B.
- Blood Cultures
- Peripheral Culture
BONE SCAN

• Technetium  90%  in 2-4 days.

• Gallium  90%  in 2 days.

• Both 94%.
MRI T1
MRI
T2
Epidural Abscess
Organism Identification

- Blood Cultures
- Peripheral Cultures
- CT Guided Biopsy
- Open Biopsy

\{ 60 \% +ve \} \quad 70-86 \% +ve
Treatment Goals

- Reverse Neurological Deficit
- Relieve Pain
- Eradicate Infection
- Establish Spinal Stability
- Prevent Relapse
Conservative Treatment

- Antibiotics
  - Intravenous
    - 4-6 weeks
  - Oral
    - 2-4 months
  - Monitor ESR
  - Optimize Medical Status
- Immobilise
Surgery Indications

- Open biopsy
- Neurological Deficit
- Spinal Cord Compression
- Abscess
- Significant Deformity
- Failed Conservative Management
- Potential Deformity
Surgery Objectives

- Drain Abscess
- Debridement
- Stabilisation
- Decompression
Approach

- Anterior
- Bone Graft
- +/- Posterior Spinal Fusion For Deformity
- +/- Instrumentation
Prognosis

Prior to Antibiotics mortality 25-71 %

Now < 5 %
Tuberculosis Spine
Epidemiology

- Evolving Nations
  - Immigrants
  - Aids
  - Homeless
  - Institutions
  - Alcoholic

- Industrial Nations
Pathophysiology

- Starts in Metaphysis
- Secondary to extraspinal focus
- Usually Multilevel
- Average of 3 Levels
Clinical Signs

- Pain (commonest)
- +/- Weight Loss
- Fever
- Malaise
Investigations

- W.C.C. (Usually Normal)
- E.S.R. ↑
- Tuberculin Skin Test +ve
- CT Guided Biopsy
Radiology

- Plain X-ray
- MRI (Investigation of Choice)
- CT (Best for Abscess)
Psoas Abscess
Metaphyseal Destruction
MRC Trials

• Commenced 1973

• Clinical Trials of Management of TB Spine in Korea & Hong Kong
Korea 1976

• Chemotherapy was effective in the majority of cases

• No advantage from bed rest or a plaster jacket
Hong Kong 1982

- No difference between simple debridement Vs radical anterior debridement with bone grafting. (The Hong Kong Procedure)

- More rapid fusion

- Less progression of kyphosis
Korea

- 20 of 27 with Paraparesis → Full recovery on Anti TB therapy alone.
Surgical Indications

- Complete Paralysis
- Profound Neurology
- Other studies have operation rates of 20%-49%
Treatment Summary

- Chemotherapy Still Cornerstone Treatment

- Surgical Indications Vary

- Hong Kong Procedure is Procedure of Choice
Paediatric Discitis
Aetiology

• Infectious

• Traumatic

• Inflammatory
Infectious

• Immature Anatomy
• Primary Infection Disc
• Organisms - Staph. Aureus
  - Salmonella
Traumatic Alexander 1970
Partial Dislocation of Ephysis Secondary to a Flexion Injury
Inflammatory

- Rybobby et al. 1993
- 18 Kids Average age 3 yrs 3 months with Discitis

- 16 Operative Biopies
  - Non specific Inflammation 10
  - Other 2
  - Normal 5
Treatment

• Bed Rest
• IV Antibiotics
• Oral Antibiotics 3 weeks
• Orthosis 3 months
• Operative
Thank You