

## Back Pain in Children & Adolescents

Mr John Dorgan

## Back Pain in Children

- 50% of children by age 15yrs
- 80% Non specific mechanical pain
- History
  - Onset
  - Character
  - Location
  - Associated constitutional symptoms
  - Aggravating or Alleviating factors

## Backpain in Children

- Examination
  - General physical assessment
  - Spinal assessment
    - Look
    - Feel
    - Move
  - Neur ological assessment

## Backpain in Children

- Diagnostic Studies
  - Plain Xray
  - Bone scan
  - CT Scan
  - MRI
  - Blood tests

## CAUSES OF BACKPAIN

- Mechanical disorders
- Devel opmental disorders
- Inflammatory disorders
- Neoplastic disorders

## MECHANICAL DISORDERS

- Postural problems
- Muscular disorders
- Overuse syndromes
- Disc prolapse



## MECHANICAL DISORDERS

- Postural problems
- Muscular disorders
- Overuse syndromes
- Disc prolapse



## PID in Children

- Rare
- Bizarre presentation
- Often normal neurology
- MRI



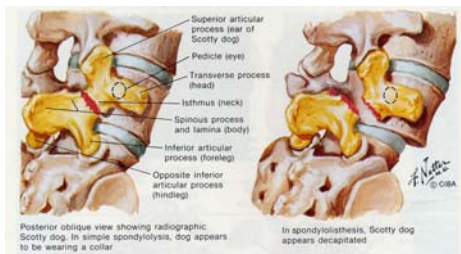
## PID in Children

- Treatment
  - Non-Operative
    - Rest
    - NSAIDs
    - Physio
  - Operative
    - Chemonucleolysis
    - Discectomy

## DEVELOPMENTAL DISORDERS

- Spondylolysis
- Spondylolisthesis
- Scheuermann's disease

## Spondylolysis




## Scottie Dog



## SPONDYLOLYSIS

- Defect in pars interarticularis
- 20% unilateral
- 7 -15 yrs
- Sports
- 5 – 7% population
- Hamstring tightness




## SPONDYLOLISTHESIS


- Type I Dysplastic 20%
- Type II Isthmic 50%
  - a) Lytic
  - b) Elongated
  - c) Acute fracture
- Type III Degenerative 25%
- Type IV Traumatic
- Type V Pathological

## SPONDYLOLISTHESIS


- Type I Dysplastic
  - Dome shaped sacrum
  - L5/S1
  - Spina Bifida Occulta
  - Attenuated pars



## SPONDYLOLISTHESIS



Type II



Type III

## SPONDYLOLISTHESIS


- Clinical features





## TREATMENT OF SPONDYLOLISTHESIS

- Depends on pathology
- Length of history
- Level of symptoms
- Age of patient
- Neurological status
- Non-operative
- Operative



## Spondylolisthesis

## NON OPERATIVE

- Rest
- Modified activities
- Physio
- Support

## OPERATIVE

- Fusion +/- decompression

## OPERATIVE

## SCHEUERMANN'S DISEASE

- 0.5 - 8% population
- Males > females
- Family history - Roundback
- Osteochondrosis of ring apophysis
- Schmorl's nodes

**Holger Werfel Scheuermann**  
1877 - 1960

Holger Scheuermann, born into a family of family men Cephalogen, obtained his medical degree at the University of Copenhagen, with training in orthopaedic surgery and pediatrics.

## SCHMORL'S NODES

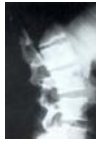
**Christian George Schmorl**  
1862 - 1942

Schmorl was a German anatomist and orthopaedist. He is best known for his work on the human spine, particularly the intervertebral discs and the Schmorl's nodes. He was a professor at the University of Bonn and the University of Göttingen.

The Human Spine in Health and Disease

## SCHEUERMANN'S DISEASE CURVE TYPES

- Thoracic  
Apex T7 - T9  
Compensatory Lordosis  
Minor scoliosis
- Thoracolumbar  
Apex T10 - T12
- Lumbar  
Low back pain



## SCHEUERMANN'S DISEASE XRAY CHANGES

- Irregular upper and lower Vertebral end plates
- Loss of disc space height
- Wedging of > 5deg in one or more adjacent vertebrae
- Kyphosis > 50deg

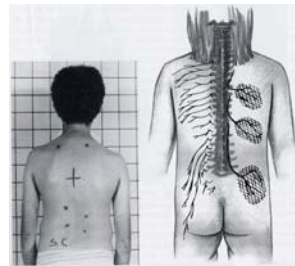


## SCHEUERMANN'S DISEASE

- Variable
- Few symptoms if Kyphosis < 60deg
- No cardiopulmonary Problems in curves < 110deg
- Benign course in Most patients



## Pain Distribution



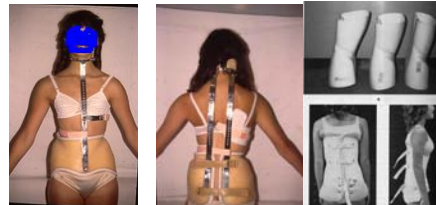
## SCHEUERMANN'S DISEASE TREATMENT

- **PHYSIO**
- **BRACES** - curves < 70deg  
maturity < Risser 3  
wedging < 3 vertebrae
- **SURGERY**

## SCHEUERMANN'S DISEASE BRACE TREATMENT

Milwaukee Brace

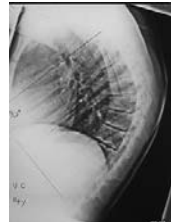
Boston Brace



## SCHEUERMANN'S DISEASE SURGERY

- Major procedure
- Anterior and posterior surgery needed
- Problems with a junctional kyphosis
- Only needed for curves > 75 deg
- Caution needed in adults

## SCHEUERMANN'S DISEASE SURGERY



pre-op



post-op

## CAUSES OF BACKPAIN

- Mechanical disorders
- Developmental disorders
- Inflammatory disorders
- Neoplastic disorders

## INFLAMMATORY DISORDERS

- Discitis
- Disc space calcification
- Osteomyelitis
- JCA
- Ankylosing spondylitis

## INFECTIVE DISCITIS

- 2 – 7 yrs
- 75% Lumbar
- 25% Thoracic
- History of recent infection
- May be more than one disc

## INFECTIVE DISCITIS

- SYMPTOMS
  - Backache
  - Leg pains
  - General ill health
  - Refusal to stand, sit, walk
  - Headache
  - Vomiting

## INFECTIVE DISCITIS

- SIGNS**
  - Irritable
  - Mild toxaemia
  - Stiff back
  - Loss of Lordosis
  - Hamstring spasm
  - Normal neurology



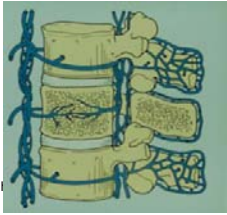
## INFECTIVE DISCITIS

- SITE**
  - Lumbar > Thoracic
  - Metaphysis near A.L.L.



## INFECTIVE DISCITIS

- Spread of infection**
  - Batson(1940)
    - Paravertebral venous plexus
  - Wiley & Trueta (1959)
    - Infected emboli in arterial system
  - La Rocca (1982)
    - Ascending and descending arterial branches and through cancellous bone



## INFECTIVE DISCITIS

- Investigations**
  - FBC, ESR, CRP
  - Blood Cultures
  - Plain Xray
  - Bone Scan
  - MRI



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## INFECTIVE DISCITIS

- Treatment
  - Rest
  - Analgesics
  - Antibiotics - identify the organism  
select correct antibiotic  
deliver the antibiotic

## INFECTIVE DISCITIS

- Antibiotic Therapy
  - IV initially
  - Change to oral if resolving clinical course
  - reliable parents
  - no vomiting and/or diarrhoea
  - suitable oral preparation
  - Duration 6 weeks



## INFECTIVE DISCITIS

- Treatment
  - Rest
  - Analgesics
  - Antibiotics - identify the organism  
select correct antibiotic  
deliver the antibiotic  
arrest tissue destruction
  - Spinal jacket
  - Surgery

## CAUSES OF BACKPAIN

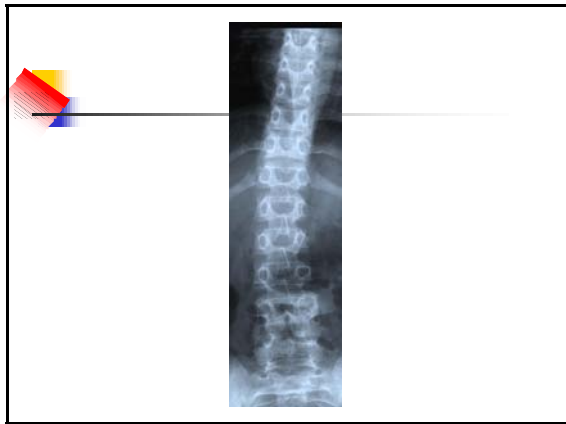
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- Developmental disorders
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## NEOPLASTIC DISORDERS

- BENIGN MALIGNANT
- Vertebral column
- Spinal cord/canal
- Muscle
- Metastatic disease

## NEOPLASTIC DISEASE

- Benign Vertebral Tumours
  - Osteoid osteoma
  - Osteoblastoma
  - ABC
  - Giant cell tumour
  - Eosinophilic granuloma
  - Osteochondroma



### NEOPLASTIC DISEASE

- Malignant Vertebral Tumours

Ewings sarcoma  
 Chondrosarcoma  
 Osteosarcoma  
 Metastases  
 Leukaemia

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### INTRASPINAL TUMOURS

- Extradural
  - Neuroblastoma - Ganglioneuroma
  - Neurofibroma
  - Sarcoma

### INTRASPINAL TUMOURS

- Intradural - extramedullary
  - Dermoids
  - Meningiomas
  - Neurofibromas
  - Schwannomas


## INTRASPINAL TUMOURS

- Intramedullary
  - Astrocytoma
  - Ependymoma
  - Glioma



## INTRASPINAL TUMOURS

- Clinical features
  - Weakness
  - Backpain
  - Extremity pain
  - Incontinence
  - Muscle spasm
  - Sensory changes
  - Scoliosis



## BACK PAIN

- Summary
  - Many causes
  - Difficult to diagnose
  - < 10yrs discitis and tumours more common
  - > 10yrs mechanical and developmental problems more common

## BACK PAIN

- Summary
  - Danger signs
    - Constant or increasing pain
    - Night pain
    - Systemic signs
    - Stiff spine
    - Spasm
    - Neurological signs



## THANKYOU

