

# OSTEOPOROSIS, METABOLIC AND INFLAMMATORY DISEASES OF THE SPINE

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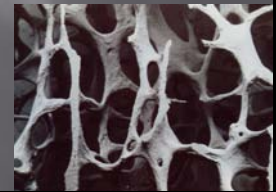
## Introduction

- The aim of this lecture is to improve your awareness/refresh your memories
- Conditions that may present to you as spinal pain
- Remember RED FLAGS!
- Some of these need appropriate management to avoid prolonged pain and suffering

## Osteoporosis

- A skeletal disease characterised by low bone mass per unit volume
- Increased fragility and susceptibility to low - trauma fractures (vertebral most common) (WHO definition 1994)
- Osteoporosis is defined by a T-score (sex and race matched) of  $-2.5$  standard deviations (SD) or lower on dual-energy X-ray absorptiometry
- Z-score is age, sex and race matched

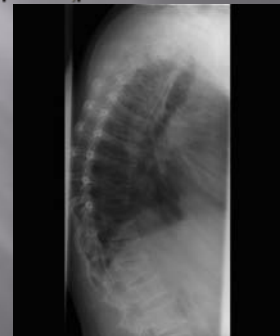
## The problem



## Incidence

- On the increase
- 5 million new vertebral fractures every year worldwide (70-80% low velocity or no trauma)
- How does it affect Trauma and Orthopaedics?
- Cost of treating osteoporotic fractures £ 2.1 billion per year by 2010 in UK
- How does it affect Spinal surgery?

## Osteoporotic fracture



## Topography of #s

- TABLE 5 Proportion of total vertebral, wrist and proximal humerus fractures by fracture site

Age	Spine #	Wrist#	Proxi mal Humeral#
50-54	20	65	15
55-59	26	60	14
60-64	22	61	18
65-69	29	58	13
70-74	36	47	17
75-79	38	43	19
≥ 80	39	41	20

Stevenson et al Health Technology Assessment 2007; Vol. 11: No. 4

## Primary prevention.

- Ensure adequate calcium and vitamin D
- Alendronate, etidronate, risedronate, raloxifene and strontium ranelate

(NICE guideline Oct 2008)

## Secondary prevention.

- Alendronate, etidronate, risedronate, raloxifene, strontium ranelate and teriparatide
- Recommended for the secondary prevention of osteoporotic fragility fractures in postmenopausal women

(NICE guidelines Oct 2008)

## Natural history

- Various studies have followed up the outcome of osteoporosis
- Some studies have studied the long term prognosis of vertebral osteoporotic fractures
- Can we alter the short term outcome with surgical intervention? Long term?

## Management

- Non operative: bracing etc
- Operative: minimal surgery such as cement augmentation
- Cement augmentation and MISS?
- Conventional open stabilisation

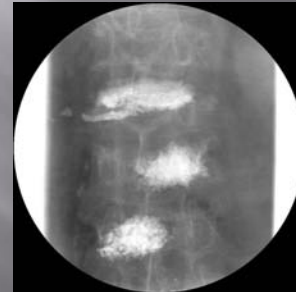
## Cement augmentation.

- Symptom relief by stabilising the fracture
- Improve sagittal profile
- Improve analgesic requirement
- Reduce further fractures
- Vertebroplasty or kyphoplasty?

## Vertebroplasty

- Day case procedure, LA + sedation
- Unipedicular access
- Injection of small quantities of cement
- Does it improve vertebral height and sagittal profile?
- The analgesic benefit of percutaneous vertebroplasty and the low complication rates suggest that it is a useful therapy for acute painful osteoporotic vertebral fractures (Terrence et al MJA 2006; 184 (3): 113-117)

## Vertebroplasty



## Kyphoplasty

- Day case procedure, LA + sedation
- Bipedicular access
- Inflation of balloons with dye
- Injection of cement into void created (low pressure)
- Improve vertebral height and sagittal profile?
- It is unrealistic to expect a 1 or 2-level kyphoplasty to improve significantly the overall sagittal alignment after VCFs (Pradhan et al. Spine 2006 Feb 15;31(4):435-41)

## CA and MISS

- Restore vertebral height and maintain with posterior instrumentation
- Is it better than conventional posterior stabilisation alone?
- Will implants fail without fusion?

## Osteomalacia

- Deficient mineralization of osteoid due to inadequate serum calcium and phosphorus levels
- Aetiology is dietary deficiency, malabsorption, renal tubular defects etc
- Presents as generalised bone pain
- Diagnosis confirmed by laboratory studies of calcium and phosphorus levels as well as bone biopsy

## Osteopetrosis

- Group of disorders caused by impaired osteoclast function
- Osteoclasts lack the ruffled border required for effective resorption
- AR- Infantile or malignant form
- AD- Albers Schonberg disease
- Radiographs show the classic Ruggery appearance

### Rugger-Jersey spine



### Osteopetrosis

- Presents as bone pain
- Increase in susceptibility to fracture
- Differential diagnosis

### Paget's disease

- Increased bone resorption due to increase in osteoclast size and number
- Compensatory increase in disorganised osteoblastic bone formation
- Varies from 3% (>40yrs) to 10% (>80yrs)
- More in males and HLA-DQw1
- Mono or poly ostotic
- Goes through lytic, mixed and sclerotic phases

### Paget's- picture frame



### Paget's disease

- Usually a symptomatic
- Bone pain unrelated to activity and worse at night
- High output cardiac failure
- Pathological fracture
- Elevated serum alkaline phosphatase and urinary hydroxyproline

### Inflammatory diseases

- Rheumatoid arthritis
- Sero-negative spondyloarthropathies

## Rheumatoid arthritis (RA)

- Affects approximately 3% of women and 1% of men
- Diagnostic criteria developed by the American Rheumatism Association
  - Morning stiffness
  - Small joint swelling
  - Subcutaneous nodules
  - Positive laboratory tests
  - Radiographic findings

## RA - Spine

- Morning stiffness and pain (occipital headache)
- Deformity
- Progressive permanent stiffness
- Instability causing dynamic neural compression
- Stenosis due to pannus and instability
- Progressive myelopathy

## Sero-negative spondyloarthropathies

- inflammatory spinal pain or synovitis together with at least 1 of the following:
  - positive family history
  - psoriasis
  - inflammatory bowel disease
  - urethritis or acute diarrhoea
  - alternating buttock pain
  - enthesopathy
  - sacroiliitis

## Types of SA

- Ankylosing spondylitis
- Reiter's syndrome
- Psoriatic arthritis
- IBD with spondylitis
- Poly and pauci articular JRA
- Sjogrens syndrome

## Questions?

## Summary

- Consider a differential diagnosis when faced with a patient with back pain
- Confirm diagnosis by imaging, laboratory tests and biopsy if necessary
- Multi disciplinary team to plan management and carry out optimum treatment