LOW BACKACHE – PATHOPHYSIOLOGY AND MANAGEMENT(INCLUDING FAILED BACK SYNDROME)

LOW BACKACHE

PREVALANCE AND MAGNITUDE OF THE PROBLEM

- LBA is extremely prevalent with lifetime prevalence of 60-90%
- Annual incidence -5%
- One of the most common reason for people to seek medical attention
- Accounts for up to 15% of sick leave from work and hence a major health and economic burden

LBA-CLINICAL SYNDROMES

- Myofascial syndrome
- Neural compression syndrome
- Mechanical (instability) syndrome
- Inflammatory syndrome
- Neuropathic syndrome
- Psychosocioeconomic syndrome

LBA-Classification according to presentation

- ACUTE : <6 WEEKS

  Most are non specific, only 10-20% have anatomical diagnosis, 80-90% improve within 1 month

- SUBACUTE : 6 WEEKS - 3 MONTHS

  In 10% of cases pain present beyond 6 weeks.

- CHRONIC : >3 MONTHS

  Only 5% have pain beyond 3 months

  Structural diagnosis is possible in 50% cases

LBA : ETIOLOGY

- Mechanical / Musculoskeletal pain
  - minor trauma
  - muscle strain
  - sprain
- Degenerative spine disorders
  - lumbar disc herniation
  - lumbar canal stenosis
  - spondylolisthesis

LBA : ETIOLOGY

Non Degenerative causes

- 1. Metabolic : Osteoporosis, osteomalacia
- 2. Inflammatory : Ankylosing spondylitis, Reiter's disease, psoariasis, enteropathic arthritis, fibromyositis, rheumatoid arthritis
- 3. Infectious : pyogenic, granulomatous
- 4. Neoplastic
- 5. Juxtafacet cysts

LBA : ETIOLOGY

- Extra spinal causes
  1. Hip diseases : Trochanteric bursitis
     Degenerative
     arthritis of hip
  2. Pelvic and lower abdominal diseases :
     Endometriosis
     Sigmoid diverticulitis
     Post. wall D U
     Retro peritoneal tumor
     Dissected aortic aneurysm

LBA – Anatomical considerations

- Pain sensitive structures of low back
  1. Lumbar spine, sacrum
  2. Sacro iliac articulations
  3. Coccyx
  4. Muscles, tendons, ligaments
  5. Neural elements : cauda equina
     nerve roots
     peripheral nerves

INNERVATION

- Posterior primary ramus innervates the vertebral and para vertebral osseo musculo ligamentous structures
- Recurrent nerve of Lushka, a branch of post primary ramus, receives sensory branches from dura , PLL, facet joint capsules, erector spinae, annulus fibrosis but not nucleus pulposus

DEGENERATIV SPINE DISEASES (DSD)

Progressive deterioration of structures of spine :

1. Disc abnormalities
2. Facet joint abnormalities
3. Osteophyte formation
4. Spondylolisthesis
5. Hypertrophy of ligamentum flavum

ETIOLOGY OF DSD

- Cumulative effects of micro trauma / macro trauma
- Osteoporosis
- Cigarette smoking
- Obesity
- Loss of abdominal and paraspinal muscle tone

PATHOPHYSIOLOGY OF DSD

- Pathological disc alterations

1. Nuclear degeneration :
   - proteoglycan content of disc decreases with age
   - disc dessication (loss of hydration)
   - annular tears develop
2. Nuclear prolapse : due to increased nuclear pressure under mechanical loads
3. Nuclear fibrosis : due to mucoid degeneration and ingrowth of fibrous tissue
4. Disc resorption
5. Loss of disc space and osteophyte formation

PATHOPHYSIOLOGY OF DSD

- Concurrent changes in facet joints
  - Synovitis
  - Synovial tags in joints
  - Capsular tears
  - Capsular laxity
  - Degeneration of articular cartilage
  - Osteophyte formation and hypertrophy of articular facets and ligaments

These changes may produce spinal stenosis which can lead to neural compromise

PATHO PHYSIOLOGY OF SCIATICA

Incompletely understood ; possible mechanisms include :

- Mechanical pressure on nerve root :
  - -edema
  - -altered nutrient transport
  - -inhibition of axonal conduction
- Role of inflammation
  - - evidence of inflammatory cells in disc specimen removed at surgery
  - -presence of phospholipase A2 , an inflammatory mediator in disc specimen
- Experimental application of nucleus pulposus without compression of nerve roots result in alteration of blood flow and nerve conduction velocities

LUMBAR CANAL SENOSIS

CLASSIFICATION :

Depending on location :

1. central canal stenosis : decreased AP diameter
2. foraminal stenosis
3. lateral canal stenosis : height less than 3 mm

Depending on aetiology

1. congenital
2. acquired

PATHO PHYSIOLOGY OF LCS

Progressive narrowing of spinal canal attributed to :

- Acquired degenerative changes such as thickened laminae
- Medially impinging arthritic facets
- Infolding of hypertrophied yellow ligament
- Hyperlordosis
- Ossification of PLL

PATHO PHYSIOLOGY OF LCS

Radiculopathy and neurogenic claudication associated with LCS are attributed to

- Direct mechanical compression
- Indirect vascular insufficiency leading to decreased oxygenation of lumbar nerve

LBA : MANAGEMENT PRINCIPLES

INITIAL CLINICAL ASSESSMENT :

Major Goal : To detect ‘RED FLAGS’ that may indicate potentially serious spinal or nonspinal pathology such as ;

- fracture
- tumor
- infection
- cauda equina syndrome

AHCPR classification of back problems

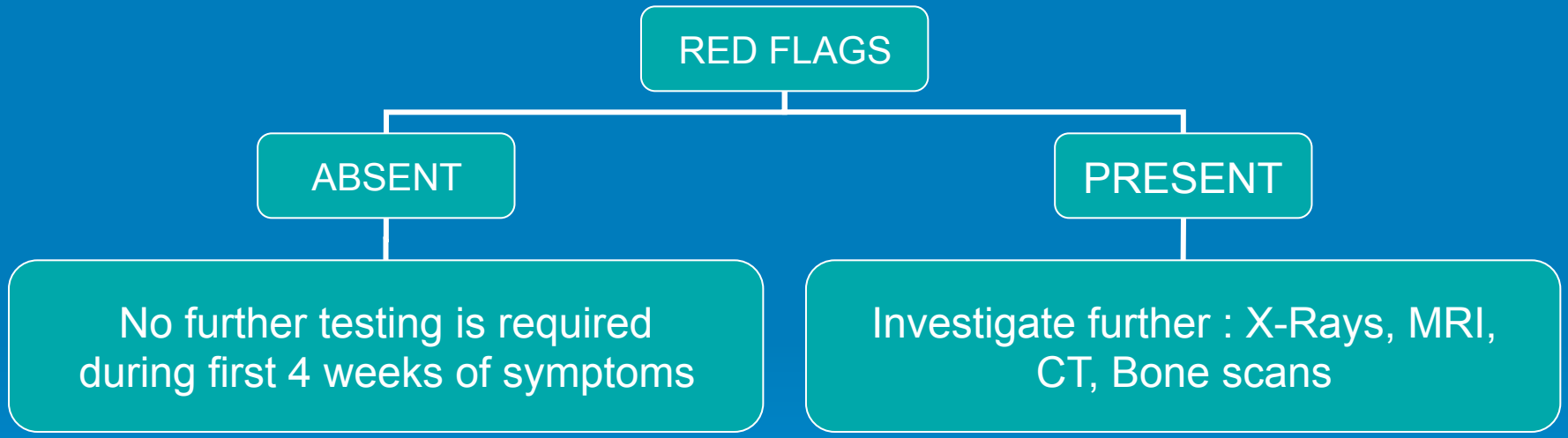
- CLINICAL CATEGORY :

  1. potentially serious spinal condition

  2. sciatica

  3. nonspecific back problems

LBA : MANAGEMENT PRINCIPLES
ACUTE BACKACHE



LBA – TREATMENT PRINCIPLES

- CONSERVATIVE / NON SURGICAL
- SURGICAL

CONSERVATIVE MANAGEMENT OF LBA

- ANALGESICS
  - initially use NSAIDS or acetaminophen
  - Opioids: for short term period only(2-3 weeks)
  - dubious role of muscle relaxants in LBA

CONSERVATIVE MANAGEMENT OF LBA

BED REST :

Objective : to reduce symptoms by

- reducing pressure on nerve roots by decreasing intra discal pressure which is lowest in supine semi fowler position
- reducing movements which cause pain

AHCPR recommendations : Majority will not require bed rest.

-bed rest for 2-4 days may be an option for those with initial severe radicular symptoms

- prolonged bed rest (> 4 days) appears to be worse for patients by producing weakness, stiffness, increased pain

CONSERVATIVE MANAGEMENT OF LBA

- ACTIVITY MODIFICATIONS :

  Risk factors : jobs requiring

  -heavy / repetitive lifting

  -asymmetrical postures

  -prolonged sitting / standing

GOAL : to achieve a tolerable level of discomfort

AHCPR recommendations :

- temporarily limit the risk factors
- then establish activity goals to help return to full functional status

CONSERVATIVE MANAGEMENT OF LBA

- EXERCISE

AHCPR recommendations

- use low stress aerobics during 1st month like walking cycling

- after 1st month – do conditioning exercises for trunk muscles

- use gradually escalating exercise grade

CONSERVATIVE MANAGEMENT OF LBA

EDUCATION

- Explain the condition to the patient
- Positive reassurance
- Proper posture, sleeping positions, lifting techniques

CONSERVATIVE MANAGEMENT OF LBA

SPINAL MANIPULATION THERAPY

- useful in facet slippage with radiculopathy
- doubtful role in acute backache without radiculopathy

-use during initial 4 weeks only when 'RED FLAGS' are ruled out

CONSERVATIVE MANAGEMENT OF LBA

EPIDURAL INJECTIONS OF CORTICOSTEROIDS

-recommended only for short term relief of radicular pain when control on oral medications is inadequate

CONSERVATIVE MANAGEMENT OF LBA

Not recommended by AHCPR panel for acute LBA

- Oral steroids
- Anti depressants
- TENS
- Ultrasound
- Lumbar corsets
- Facet joint injections
- Acupuncture

SURGICAL TREATMENT OF LBA

- URGENT SURGERY is indicated in
  - cauda equina syndrome
  - progressive neurological deficits
  - profound motor weakness
  - rarely in intractable severe pain

SURGICAL TREATMENT OF LBA

ROUTINE SURGERY is indicated in

- 4-8 weeks of symptoms, not improving with time, and with radiologically identified abnormality that correlates with findings on history and physical findings
- <4 weeks of symptoms with potentially serious spinal conditions

SURGICAL OPTIONS OF LBA

- Central or para central PIVD
- Far lateral or foraminal PIVD
- LCS

- Standard discectomy; microdiscectomy; endoscopic disc excision; laser disc decompression; chemo papain
- Partial or total facetectomy; endoscopic technique, extra canal approach
- Simple decompressive laminectomy; laminectomy and fusion

FAILED BACK SYNDROME

- DEFINITION : The failure of lumbar spine therapy to relieve pain and incapacitation
- Multifactorial- organic, psychological and social factors
- Failure rate of lumbar discectomy is 8-25%

FBS - ETIOLOGY

- INCORRECT INITIAL DIAGNOSIS (most common cause)

- Incorrect pre op imaging
- Clinical findings not correlated with imaging
- Missed associated pre op conditions

  eg. Trochanteric bursitis, diabetic amyotrophy, hip/knee arthropathy, myofascial pain syndrome, occult pelvic malignancy

FBS - ETIOLOGY

- **PERSISTANT NERVE ROOT / CAUDA EQUINA COMPRESSION :**

- Residual disc material
- Recurrent disc herniation at the same level / another level
- Epidural fibrosis
- Lumbar spinal stenosis
  - associated with midline fusion
  - recurring over many years at the same level
  - recurring at different levels

FBS - ETIOLOGY

- SEGMENTAL INSTABILITY :
  - associated with laminectomy and total facetectomy leading to spondylolisthesis
  - post op scoliosis
  - lateral rotational instability
  - Macnab’ consider ‘traction spurs’ as an indication of segmental instability
  - Transitional syndrome ; seen in spinal fusions

FBS - ETIOLOGY

- Permanent nerve root injury – deafferentiation pain
- Adhesive arachnoiditis – related to sub arachnoid bleed ; best cure is prevention
- Discitis - present 2-4 weeks after surgery
- Non anatomical factors :

  -poor patient motivation

  - primary gains ; avoidance of unpleasant tasks

  -secondary gains

  - psycho social factors

FBS-MANAGEMENT GUIDELINES

- Proper clinical and radiological assessment to ascertain one of the above mentioned causes
- Rehabilitation programmes to be started early
- Pharmacological management
  - -NSAIDS
  - -Anti depressants
- Psycho social management

FBS-MANAGEMENT GUIDELINES

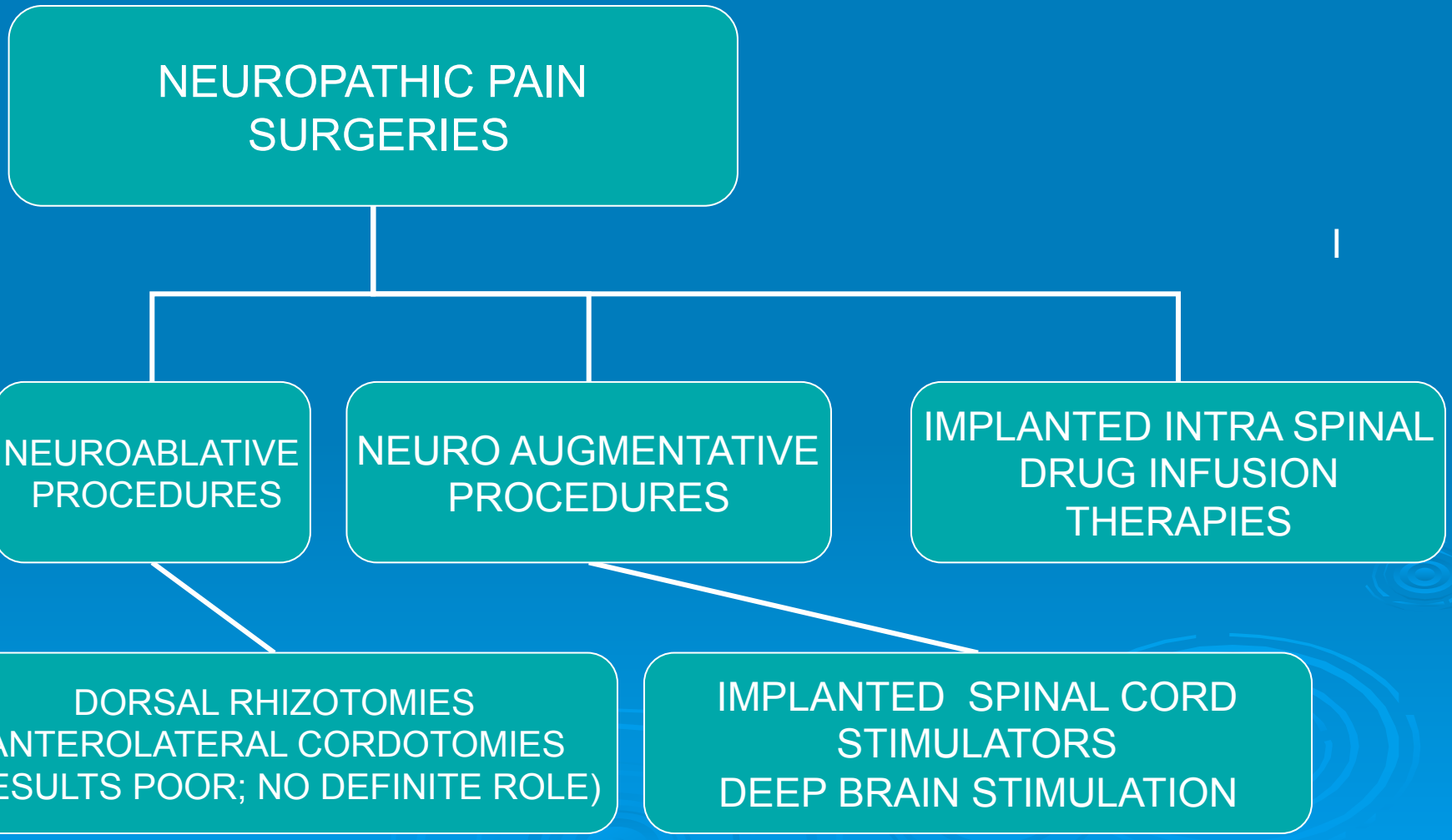
- SURGICAL MANAGEMENT :

Success rate of re operation 25-80%

Indicated in 2 clinico anatomical conditions

1. Neural compressive process : LCS
   PIVD
2. Lumbar segmental instability

FBS-MANAGEMENT GUIDELINES



NEUROPATHIC PAIN PROCEDURES-SCS

North et.al (Neurosurgery 1993) reported that in carefully selected patients suffering from end stage FBS and treated with implantable spinal cord stimulation – 50% pain relief in long term with substantial improvement in QUALITY OF LIFE

Bees et.al (J.pain sym and management 1997) has shown better response to spinal cord stimulation than to re operation