

Nerve Injury following THA

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Overview

- Nerve injury
- Background
- Diagnosis
- Prognosis
- Management
- Preventative measures

Nerve Injury- Seddon Classification

- **Neuropraxia**
 - Minor injury (conduction block)
 - All anatomic structures intact
- **Axonotmesis**
 - Axon disruption
 - Intact connective tissue
- **Neurotmesis**
 - Complete disruption of all layers
 - Worst outcome

Mechanism of Injury

- **Compression**
 - Subfascial haematoma
- **Stretch**
 - Pre-existing nerve mobility
 - Intra-operative traction
 - Excessive leg lengthening
- **Ischaemia**
- **Transection**

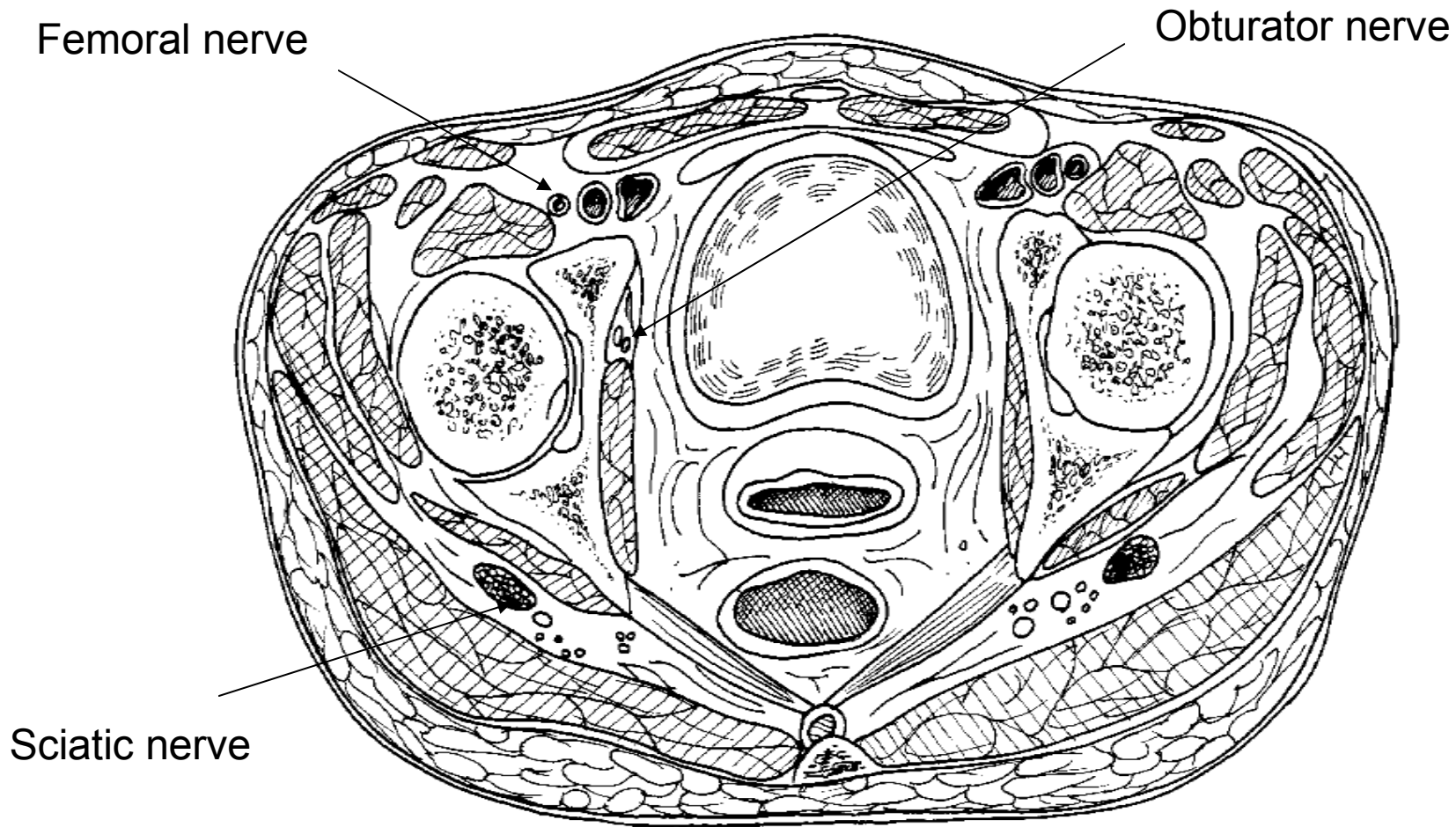
Background

- **Incidence**
 - Primary total hip arthroplasty 1-2%
 - Revision arthroplasty 3-8%
 - DDH patients 5.8%
- Cochrane r/v no difference in nerve injury incidence between posterior & lateral approaches

Background

- **Main peripheral nerves affected**
 - Sciatic
 - Common Peroneal division > tibial
 - Superior gluteal nerve
 - Femoral
 - Obturator
- **Other Nerves**
 - Peripheral nerves (position related)
 - Central nerve damage
 - Gentamicin induced CN VIII

Cross section pelvis at level of hip joint



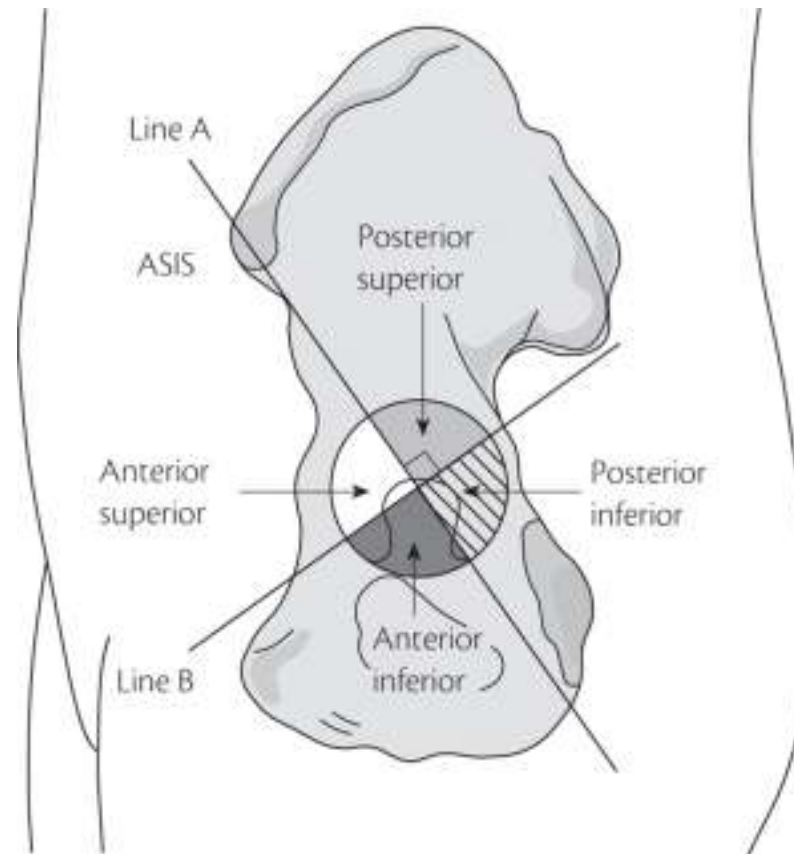
Acetabular quadrant system

PS:

- Sciatic n
- Superior gluteal n

AS:

- Sciatic n
- Inf gluteal n
- Internal pudental n



PI:

ext iliac vessels

AI:

- Obturator n

Sciatic nerve injury

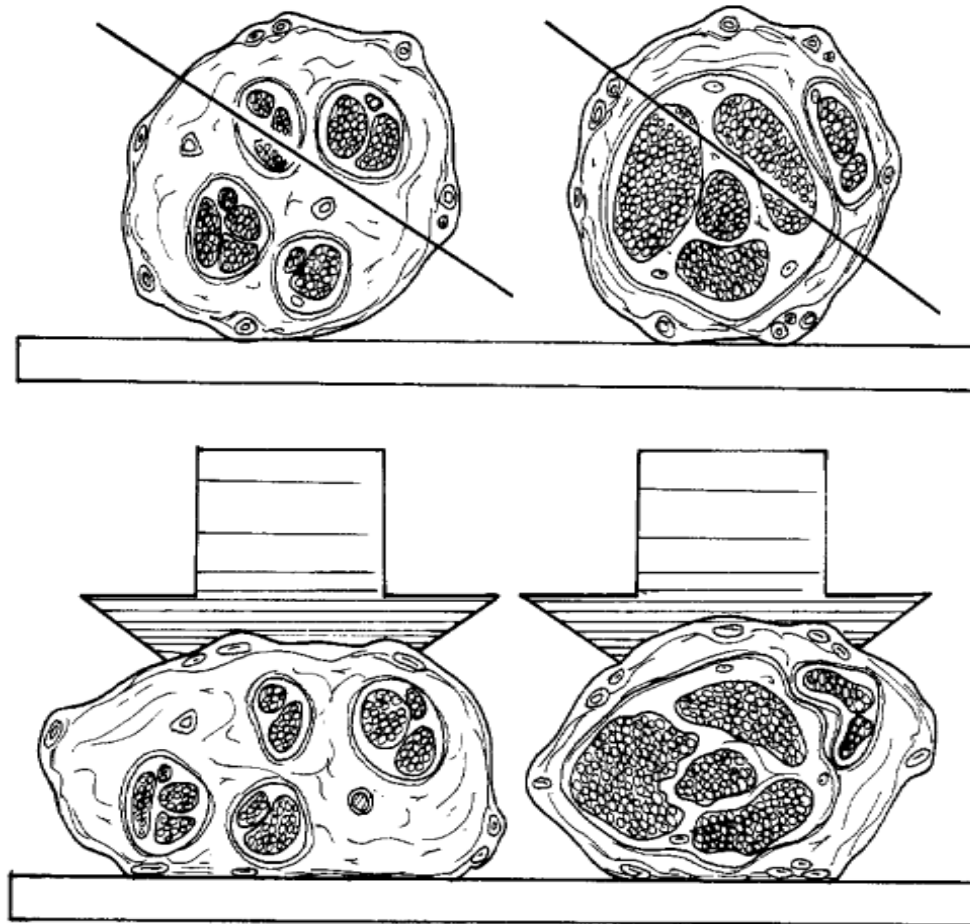
- L4-S3 nerve roots
- Tibial & peroneal divisions
 - Peroneal division most at risk
- Mol
 - Posterior acetabular retractors
 - Anterior or lateral traction on the femur
 - 50% palsies unknown cause
- Diagnosis
 - Foot drop
 - Weak plantar flexion & inversion (tibial)
 - Sensory loss

Sciatic nerve anatomy

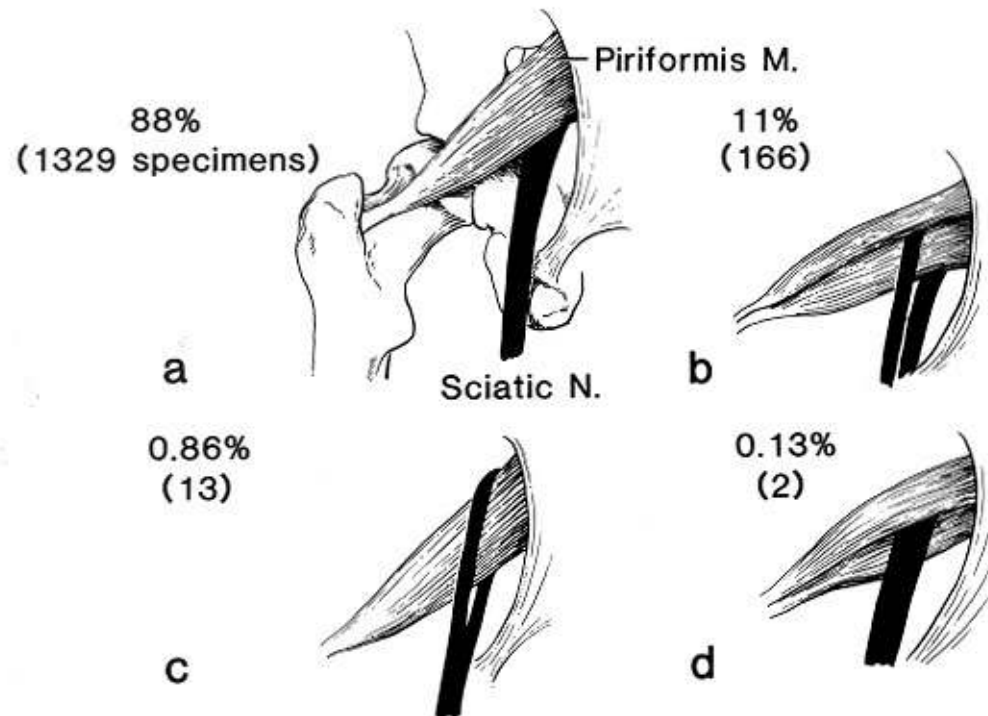
Tibial Division

Peroneal Division

Transection and
compression effect
on the sciatic nerve



Relation of Sciatic Nerve to Piriformis Muscle In 1510 Extremities Studied



Superior Gluteal nerve

- L4-S1 roots
- MOI
 - Lateral & Post approaches
- Diagnosis
 - Positive Trendelenburg
 - Weak abduction

Femoral Nerve

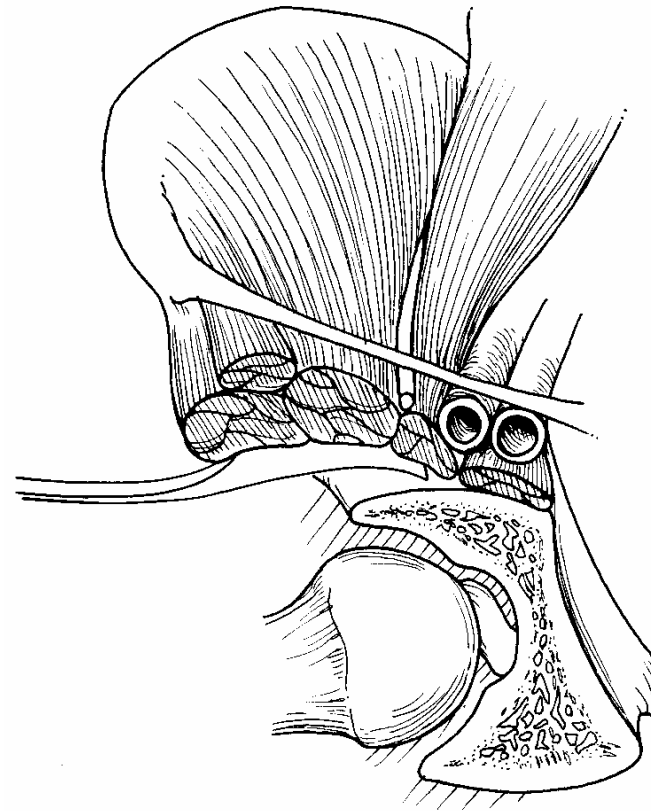
L2-L4 roots

Mol:

-Ant acetabular
retractor & anterolateral
approach

Diagnosis:

- Thigh pain
- Loss of sensation
- Quads weakness



Obturator nerve

- **L2-L4 roots**
- **MOI**
 - Cement, screws, reamers breach anterior acetabular quadrants
- **Diagnosis**
 - Persistent pain in groin or thigh
 - ADDuctor weakness

Management

- **Immediate**
- Intra operative:
 - Repair transected nerve
- Post operative:
 - Investigations:
 - USS (?haematoma)
 - Back to theatre:
 - New progressive signs & symptoms
 - Excessive leg lengthening

Management

- **Intermediate:**
- Further investigations
 - 3 months following injury
 - EMG studies
 - Objective measure of nerve damage
 - Monitor progress of nerve recovery

Management

- **Long term**
 - Watch and wait
 - Physiotherapy
 - Improve muscle function & stretch antagonist
 - Orthoses
 - Analgesia
 - Counselling
 - Pain clinic referral

Prognosis

- **Poor prognostic indicators:**
- Injury factors
 - Large nerve
 - Great distance from end organ
 - Poor local tissues (scar, vascularity, infection, tension)
 - Blunt trauma
- Patient factors
 - Elderly
 - Multiple co-morbidities
 - Smokers, steroids, diabetes, alcohol, spinal stenosis, hypothyroidism

Prevention

- **Pre operative planning**
 - Identify at risk patients
 - Template
 - Test and document nerve function
- **Intra operative**
 - Careful dissection & haemostasis
 - Identify and protect nerve, regular checks
 - Careful use of instruments
 - Avoid anterior quadrant screws
 - Leg length measuring device

Case Study

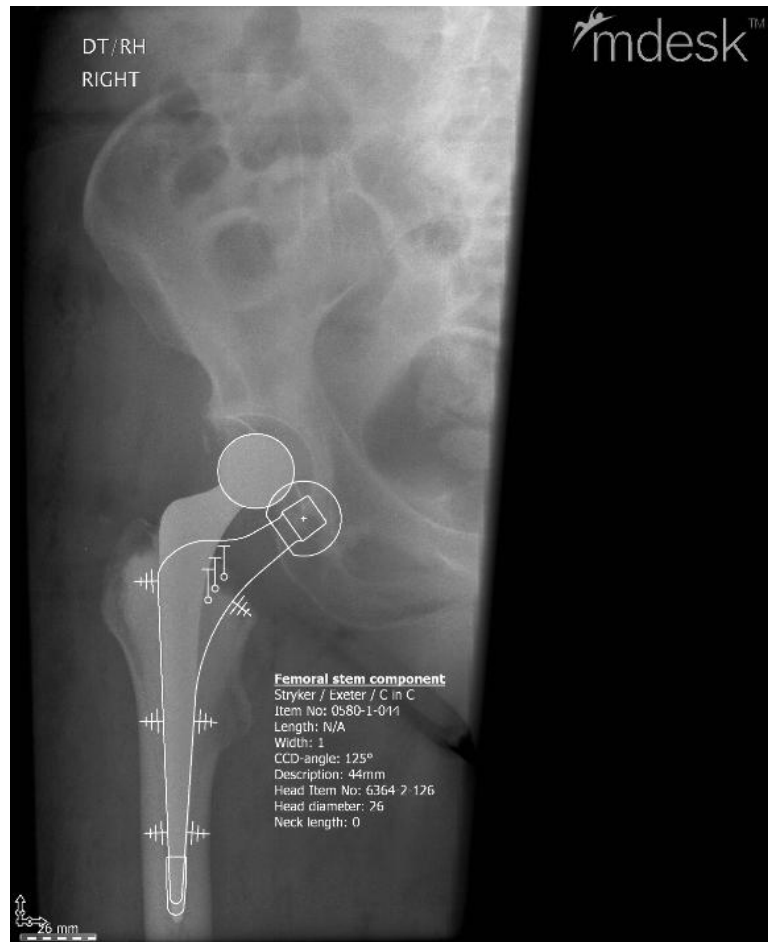
- 74yr lady
- Right hip THR for OA
- PMH: troch bursitis, MI, mastectomy, HTN
- o/e pre-op: antalgic gait, stiff, no distal neurological deficit
- Intra-op
 - Cement gun broke
 - Excessive lengthening

Day 1 post op

- Foot drop
- >2cm lengthening
- Decision made to revise stem day 2 post op



Revised



Currently

- Hip working well
- Marginal nerve improvement
- Foot orthosis
- Had nerve conduction studies at 4months post injury : typical pattern of sciatic nerve injury at the hip joint
- Continue with conservative mx

References

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