



Neuro - Orthopaedic Spinal Clinic

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The Neuro-Orthopaedic Spinal Clinic is based in Johannesburg, South Africa. The clinic provides a comprehensive approach to spinal management. This includes a full evaluation of spinal dynamics as well as state-of-the-art interventions. Both the surgeons that comprise this multi-disciplinary team have extensive training and experience in the full spectrum of spinal conditions. They are supported by a team of medical specialists, experienced spinal nurses, physiotherapists and spinal orthotists.

A review of spinal problems

The spine comprises vertebral bones which articulate with each other via posterior joints (the facets) and through the discs which separate the vertebral bodies (the motion segment). Ligaments and muscles support the bones. The disc comprises tough concentric ligaments on the outside (the annulus) and a soft centre on the inside (the nucleus pulposus), roughly comparable to a car tire. The disc thus acts as a shock-absorber. With repeated wear and tear, aggravated by occasional injury, the nucleus begins to lose water and become less elastic while the annulus weakens and bulges and eventually may rupture (slipped disc). This may lead to varying degrees of instability where increased mobility results from loss of tensioning by the “deflated” disc.

While this process progresses the facets are subjected to more stress and begin to degenerate (facet arthritis/arthrosis). Excessive bony growth may occur around the joint (osteophytes) which results in decreased movement.

With the loss of shock absorbing capacity, the opposing vertebral body surfaces enlarge to diminish the pounding effect. This results in the development of large osteophytes. The osteophytes from the vertebrae together with those from the facet joints may combine with the disc bulge to result in a significant narrowing of the spinal canal (spinal stenosis) as well as the nerve canals (intervertebral foraminal stenosis). A bulging / ruptured disc may result in a similar problem.

Significant degeneration of supporting ligaments and / joints may contribute to excessive movement of bone on bone which becomes unstable in certain postures / activities. The shifting bone may further compress the spinal canal and individual nerves. In this regard painful muscle spasm may occur, which is the body’s way of attempting to restore stability. (Muscle spasm however may also occur in response to any underlying spinal problem including arthritis.)

A review of spinal symptoms

Spinal problems may occur in the cervical, thoracic and lumbar regions. Most commonly the problems occur in the more mobile areas of the spine, the cervical and lumbar regions.

Presenting symptoms may take the form of:

- Local (neck or back) pain which may be aggravated by posture and/or activity.
- Local pain with indistinct referral of symptoms to shoulder and arm or to buttock and leg.
- Minimal pain in the neck or back with a severe pain involving the limb. The pain may be associated with numbness or pins and needles as well as weakness.
- Referred pain from the back into the buttocks, hips and legs which is aggravated by walking.
- *Symptoms requiring urgent attention:*
 - *Changes in bladder and bowel control, numbness in the private areas of the body*
 - *Sudden or increasing gait disturbances*
 - *Significant muscle weakness*

Approach to diagnosis

If symptoms are minimal and do not encroach upon daily life to any significant degree, then conservative treatment such as physiotherapy, chiropractic manipulation, analgesics may be all that is required. Should symptoms persist, deteriorate or progress to involve a limb, then a diagnosis would need to be made.

Investigative modalities which are used to establish a diagnosis include:

Straight Xrays with stress views – indicates the nature of bone structure, evidence of degeneration of structures and stability of bone-on-bone

CAT scan – provides more detail of bone anatomy but should be used in conjunction with a myelogram to outline details of neurological structure and discs

Myelogram – the injection of a contrast agent into the spinal fluid via a lumbar puncture. This outlines all the neurological structures (spinal cord and nerves) and may be used in a dynamic fashion to show changes in different postural positions. This procedure requires an admission to hospital

MRI scan – a comprehensive review of all structures in the spine and their three dimensional relationships to each other

Radio-isotope bone scan – this assesses inflammatory activity in the bone or related joints

Bone densitometry – provides information as to the presence of osteoporosis

Discogram – the injection of contrast material into the disc. This provides information as to the appearance of the disc as well as simulates possible symptoms which may be arising from the disc.

Blood tests – tests for possible underlying active arthritis such as gout, rheumatoid etc.

Principles of management

Once a diagnosis has been made, treatment is initiated. This will usually take the form of conservative management as outlined above. This may be administered as an out-patient or through an admission to hospital. The basic modalities used include the following:

- Exercise program, supervised by physiotherapist or/and biokineticist
- Other physiotherapeutic treatment
- Chiropractic management
- Medication – analgesic, anti-inflammatory, muscle relaxants
- Traction – generally for cervical spine (may continue to home traction)
- Local heat – infra-red lamp, heat pad
- Manipulation under anaesthetic
- Strict bed-rest
- Steroid (cortisone) epidural injection
- Facet blocks – with cortisone

Surgical management

In the context of a positive diagnosis, surgery may be considered if symptoms persist or deteriorate despite ongoing conservative management.

Indications for surgery may be:

Relative – there is no major neurological problem but the patient, after exhaustion of conservative options can no longer tolerate the symptoms

Absolute – severe neurological problems develop and / or a marked deterioration in stability occurs: Neurological problems include weakness, loss of sensation and loss of bladder and / or anal sphincter function

Surgical techniques

Micro-discectomy:

The removal of a prolapsed disc using magnification techniques. The advantage of this approach is the minimal invasiveness and quick recovery. It works best at the level L5/S1. At other levels however (especially at L4/L5) a recurrent disc prolapse may occur

Decompressive surgery:

This is directed at the relief of a compressed spinal canal and / or involved nerve roots. The approach is via a laminectomy if done from posteriorly or vertebrectomy from anteriorly.

Discectomy and /or decompression and fusion:

Following a discectomy, a fusion may be performed to either prevent a recurrent prolapse or treat associated mechanical instability. A fusion may be performed from anterior or posterior. Various cages or plates are used for anterior work while pedicular screws and rods are used for posterior work (titanium alloys)

Disc replacement surgery:

This is done from anterior in the lumbar or cervical spine. In this way, the disc is removed and replaced with a fully articulating prosthesis. This maintains the movement between the vertebrae and is aimed to prevent the excessive degeneration of the levels above and below the involved level(s).

The latter problem occurs with fusion surgery. In addition it restores the anatomical curvature in the relevant spinal segment(s).

Other motion preserving surgery:

Nucleus replacement: only the inner part of the disc nucleus is replaced by a “soft disc”. The indications for this procedure are very limited.

Posterior motion restricting procedures: The indications for this procedure are limited.

Surgical recovery

All patients with the exception of extensive, combined anterior and posterior, lumbar fusions are mobilized out of bed on the day following surgery (day 1).

Lumbar disc replacement and other anterior spinal surgery has potential dangers (vascular bleeding, damage to the urinary system and erectile function in man) which is almost unheard of in posterior surgery. It results in a degree of postoperative abdominal distension but postoperative pain is less and recovery generally quicker than with posterior surgery. Heat sensations in the lower limbs, anterior thigh pain or discomfort and vague numbness in the lower limbs can occur but are usually transient. Post operative retro-grade ejaculation (dry orgasm, are described but have not been encountered by us to any significant degree.

Disc replacement patients, micro-discectomy patients and anterior cervical fusion patients are all usually discharged on day 2 to 4. Patients after posterior fusion surgery stay usually 1-2 days longer due to stronger post-operative pain.

Anterior cervical fusion patients are required to wear cervical collars for 2 months when driving unless a cervical plate or other metal fixation device is inserted. Disc replacement patients are not required to wear any form of supportive bracing post-operatively.

All patients are post-operatively encouraged and shown hamstring, hip and lower back stretching and mobilisation exercises as well as isometric exercises to the supporting musculature. This should be initially supervised by the physiotherapist or biokineticist and an exercise program should be followed life-long.

All patients will be followed up until symptoms have resolved or stabilized (Microdiscectomy, Decompression surgery), until fusion is achieved (fusion surgery) and yearly (motion preservation surgery and complex fusion procedures).

Should you have any queries or concerns, please feel free to discuss them with Dr's Hähle or Weinberg