Orthopadic cors

Topic:
- Cervical spondylitis.
- Development disorders (Spondylolysis and Spodylolsithesis)
Cervical spondylitis.

**Definition:**

- a painful condition of the cervical spine resulting from the degeneration of intervertebral disks.
- is common from middle age onwards, even in people who have not been aware of any acute episode in former years.
pathophysiology:

the intervertebral disk lose hydration and elasticity with age, this starts in the nucleus pulposus and it buckling inward, the annulus fibrosis will become thinner and bulge outward.

This increase the mechanical stress at cartilaginous end plates, so the cartilage wears away and facets override and bony spurs appear at the anterior and posterior margins of the vertebral bodies on either side of the affected discs; those that develop posteriorly may encroach upon the intervertebral foramina causing pressure on the nerve roots.
Disk
Nerve
Vertebra
Bone spur
Narrowed disk
Quick review of cervical nerves

In addition to the seven cervical vertebrae, cervical anatomy features eight cervical nerve roots (C1-C8) that branch from the spinal cord and control motor and sensory abilities for different parts of the body.
The top seven cervical nerves are named based on the lower of the two cervical vertebrae that it runs between. As an example, the C6 nerve root runs beneath the C5 vertebra and above the C6 vertebra. The C8 nerve root, however, runs between the C7 vertebra and T1 vertebra.

Each level of the cervical spine actually has two nerve roots—one on each side—that branch off from the spinal cord.
Cervical Nerve Functions

<table>
<thead>
<tr>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>Motor function</th>
<th>Sensory function</th>
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<tbody>
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<td>control the head and neck, including movements forward, backward, and to the sides. These nerves also play key roles in breathing</td>
<td>The C2 dermatome handles sensation for the upper part of the head, and the C3 dermatome covers the side of the face and behind the head. (C1 does not have a dermatome.)</td>
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<td>helps control the shoulders as well as the diaphragm</td>
<td>The C4 dermatome covers the neck and top of the shoulders.</td>
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<td>controls upper body muscles like the deltoids and the biceps</td>
<td>The C5 dermatome covers the shoulders and outer part of the arm down to about the elbow or close to the wrist.</td>
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<td>controls the wrist extensors and also provides some innervation to the biceps</td>
<td>C6 dermatome covers the top of the shoulders and runs down the side of the arm and into the thumb side of the hand.</td>
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<td><strong>C7</strong> controls the triceps</td>
<td>The C7 dermatome goes from the shoulder down the back of the arm and into the middle finger.</td>
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symptoms

The condition is not always symptomatic, and many people go throughout life without experiencing anything more than slight stiffness. Troublesome symptoms come on gradually.
Clinical features

Symptoms:

profile .....The patient, usually aged over 40 years

chief complaint ..... neck pain and stiffness.

The pain may radiate: to the occiput, the scapular muscles and down one or both arms.

Paraesthesia, weakness and are occasional symptoms.
Signs:

There may be tenderness in the soft tissues at the back of the neck and above the scapulae.

Neck movements are limited and painful at the extremes.

Careful neurological examination may show abnormal signs in one or both upper limbs.
Imaging

Typical x-ray features:
- Narrowing of several disc spaces,
- Bony spur formation at the anterior and posterior edges of the vertebral bodies.

Oblique views may show bony encroachment on the intervertebral foramina.

MRI:
- Will show whether there is nerve root compression.
Differential diagnosis

Other disorders associated with neck or arm pain and sensory symptoms must be excluded. Cervical vertebral spur formation is very common in older people and this can be misleading in patients with other disorders.

Rotator cuff lesions: pain around the shoulder may resemble the referred pain of cervical spondylosis. However, features such as rotator cuff tenderness and restricted shoulder movements should suggest a local problem.

Nerve entrapment syndromes: median or ulnar nerve entrapment may give rise to intermittent symptoms of pain and paraesthesia in the hand.

Cervical tumours: with tumours of the vertebrae, spinal cord, nerve roots or lymph nodes the symptoms are unremitting. Imaging studies should reveal the diagnosis.
Treatment

During painful episodes, heat and massage are soothing; some patients benefit from a period in a restraining collar. Physiotherapy is the mainstay of treatment, patients usually being maintained in relative comfort by various measures including exercises.

Surgical treatment is indicated if severe symptoms are relieved only by a rigid and irksome support, particularly if there are neurological changes due to nerve root compression.
Spondylolysis and spondylolisthesis are common causes of low back pain in young athletes.
Spondylolisthesis is the displacement of one vertebra compared to another.

Medical dictionaries define spondylolisthesis specifically as the forward or anterior displacement of a vertebra over the vertebra inferior to it (or the sacrum).
Spondylolisthesis

Spondylo mean (spine)

Listhesis mean (slippage)
prevention mechanism

**facet joints**: are a set of *synovial, plane joints* between the *articular processes* of two adjacent vertebrae.

Normal laminae and facets constitute a locking mechanism which prevents each vertebra from moving forwards on the one below. ...... *Forward shift (or slippage)* occurs only when this mechanism fails
Listhesis (slippage) is nearly always between L4 and L5, or between L5 and the sacrum...... This usually happens for one of the following reasons:

- **Dysplasia of the lumbosacral facet joints** (20% of cases).
- **Separation or stress fracture (lysis) through the neural arch** (the pars interarticularis), allowing the anterior part of the vertebra to slip forward upon the one below (50% of cases).
  - **Osteoarthritic degeneration of the facet joints**, causing them to lose their normal stability. This usually occurs at L4/5 (25% of cases).
- **Destructive conditions such as fracture, TB and neoplasia** (5% of cases).
Facet Joints

Joint capsule
Joint cavity

Body of vertebra
Tervertebral disk
Facet joint

Break in bony ring of vertebra
Body of vertebra
Forward slippage
Spondylolisthesis can be described according to its degree of severity. One commonly used description grades spondylolisthesis, with grade 1 being least advanced, and grade 5 being most advanced. The spondylolisthesis is graded by measuring how much of a vertebral body has slipped forward over the body beneath it.
spondyloptosis
How do People Get Spondylolisthesis?

Approximately 5%-6% of males, and 2%-3% of females have a spondylolisthesis.

It becomes apparent more often in people who are involved with very physical activities such as weightlifting, gymnastics, or football.

Males are more likely than females to develop symptoms from the disorder, primarily due to their engaging in more physical activities.

Although some children under the age of five may be pre-disposed towards having a spondylolisthesis, or may indeed already have an undetected spondylolisthesis, it is rare that such young children are diagnosed with spondylolisthesis. Spondylolisthesis becomes more common among 7-10 year olds. The increased physical activities of adolescence and adulthood, along with the wear-and-tear of daily life, result in spondylolisthesis being most common among adolescents and adults.
Types of Spondylolisthesis

Developmental Spondylolisthesis: This type of spondylolisthesis may exist at birth, or may develop during childhood, but generally is not noticed until later in childhood or even in adult life.

Acquired Spondylolisthesis:  
  
  With all of the daily stresses that are put on a spine, such as carrying heavy items and physical sports, the spine may wear out (ie, degenerate). As the connections between the vertebrae weaken, this may lead to spondylolisthesis.

A single or repeated force being applied to the spine can cause spondylolisthesis; for example, the impact of falling off a ladder and landing on your feet
Clinical features

Dysplastic spondylolisthesis is seen in children. It is usually painless but the mother may notice the unduly protruding abdomen. There may be an associated scoliosis.

Lytic spondylolisthesis is the commonest variety. It occurs in adults and intermittent backache is the usual presenting symptom. Pain may be initiated or exacerbated by exercise or strain. Movements are usually normal in younger patients but may be restricted in older people.

Degenerative spondylolistheses is usually occurs in patients over 40 years with long-standing backache due to facet joint arthritis. Sometimes the presenting symptom is spinal ‘claudication’ due to narrowing of the spinal canal (see under spinal stenosis).
Also ......

Pain in the low back, especially after exercise •

scoliosis

increased lordosis. ( protruding abdomen )

Pain and/or weakness in one or both thighs or legs •

Reduced ability to control bowel and bladder functions •

In cases of advanced spondylolisthesis changes may occur in the way people stand and walk; for example, development of a waddling style of walking.

may seem shorter; •

and muscle spasms in the lowback may occur •
What is Waddling Gait?

Waddling Gait is a type of gait abnormality in which the affected patient walks like a duck.

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Imaging

X-rays show the forward shift of the upper part of the spinal column on the stable vertebra below; elongation of the arch or defective facets may be seen. The gap in the pars interarticularis is more easily seen in oblique x-ray views, and best of all in CT scans.
Treatment

conservative treatment, similar to that for other types of back pain.

is suitable for most patients. Operative treatment is indicated: (1) if the symptoms are disabling and interfere significantly with work and recreational activities; (2) if the upper vertebra has slipped forwards over more than 50% of the vertebral body below; and (3) if neurological compression is significant.
Non-Interventional Management

Conservative:
Exercise can be very beneficial for mild to moderate back pain, but if you have severe back pain be very careful, and don't do too much.
- Aerobic exercise
- Swimming
- Cycling
- Yoga and Pilates
- Physiotherapy
- Osteopathy and Chiropractic

Medications:
- NSAIDs: Ibuprofin and Diclofenac (SE: GI bleeding and fluid retention).
- COX-2 inhibitors: Arcoxia and Celebrex (better tolerated than NSAIDs).
- Mild Opioids: Codeine, Dihydrocodeine, and Tramadol.
- Strong Opioids: Buprenorphine, morphine, and fentanyl.
- Anti-Neuropathic treatments: Amitriptyline, Carbemazepine, Gabapentin, or Pregabalin.
Spondylolysis

Spondylolysis is defined as a defect or stress fracture in the pars interarticularis of the vertebral arch. The vast majority of cases occur in the lower lumbar vertebrae (L5), but spondylolysis may also occur in the cervical vertebrae.
The cause of spondylolysis remains unknown, however many factors are thought to contribute to its development.

The condition is present in up to 6% of the population, majority of which usually present asymptomatically.

Research supports that there are hereditary and acquired risk factors that can make one more susceptible to the defect.

The disorder is generally more prevalent in males compared to females, and tends to occur earlier in males due to their involvement in more strenuous activities at a younger age.

In a young athlete, the spine is still growing which means there are many ossification centers, leaving points of weakness in the spine.

as it accounts for about 50% of all low back pain.[6] It is believed that both repetitive trauma and an inherent genetic weakness can make an individual more susceptible to spondylolysis
In majority of cases, spondylolysis presents asymptotically which can make diagnosis both difficult and incidental.

**Symptoms:**
- Unilateral low back pain
- Pain that radiates into the buttocks or legs
- Onset of pain can be acute or gradual
- Pain that can restrict daily activities
- Pain that worsens after stress activity
- Pain aggravated with lumbar hyperextension

**Clinical Signs:**
- Excessive lordotic posture
- Unilateral tenderness on palpation
- Visible on diagnostic imaging (*Scottie dog fracture*)
Treatment

- Bracing to immobilize the spine for a short period (e.g. four months) to allow the pars defect to heal

- Pain medications and/or anti-inflammatory medication, as needed

- Exercise that is controlled and builds gradually over time.

On rare occasions, spondylolysis that is not healing or may have neurological components can require surgery to provide internal fixation and stability to the area. Usually, two procedures are performed as part of the same surgery:

- A decompressive laminectomy, which reduces irritation and inflammation in the area (but increases spinal instability)
- A spinal fusion to provide stabilization of the affected area.