Non-mechanical disorders: pathology

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Classification

Non-discogenic lesions which give rise to symptoms in the neck, trapezius or scapular area or in the upper limb can be classified into the following groups:

• Osseous
• Rheumatoid arthritis and ankylosing spondylitis
• Infectious
• Intraspinal
• Neurological

• Visceral
• Psychological
• Other

Osseous disorders

Fractures and luxations

A considerable variety of fractures and dislocations follow trauma between the occiput and the first thoracic vertebra. Most are caused by car accidents, with falls and sports accidents next in frequency.\(^1\)\(^2\)\(^3\) Half of all patients present with neurological problems.\(^4\)

Early diagnosis is important. The cervical fracture is often combined with another spinal fracture and therefore the entire vertebral column must be X-rayed.\(^5\) Plain radiographs are the first way in which diagnosis is established. Multidirectional CT is particularly advantageous in patients with facet injuries. CT seems to add most additional information in laminar or posterior column injuries, fractures of the vertebral body or in atlantoaxial subluxations.\(^6\)

Fractures and dislocations of the atlantoaxial complex

Fractures of the axis are common. In 14–17.5% of all fractures of the cervical spinal column the lesion lies at the axis.\(^7\) Most frequent are odontoid fractures. They are classified as type I – avulsion of the tip of the odontoid process, type II – fracture through the base and type III – fracture through the vertebral body.\(^8\)\(^9\) These are followed in frequency by those of the vertebral body, the pedicle or the lateral mass. Less common is hangman’s fracture – a bilateral fracture through the pars interarticularis of the axis. Neurological damage is not frequent in odontoid and hangman’s fractures but quite common in the other miscellaneous fractures of the axis.\(^10\)
Dislocations of the atlas are not uncommon and may lead to serious neurological damage. Fractures of the atlas are rare and seldom cause neurological problems.

In order of frequency the following fractures are found: bilateral fracture of the posterior arch, comminuted fracture of the ring of the atlas – traumatic spondylolisthesis or Jefferson’s fracture, and unilateral fracture of the lateral mass.

**Fractures of the lower cervical spine**

An accident immediately followed by the occurrence of gross limitation of movement in every direction, especially of extension (full articular pattern) strongly suggests vertebral fracture or dislocation. Apart from possible neurological problems the patient presents with severe central or bilateral neck pain and is unable to move his head as the result of muscle spasm. Properly performed radiological examination is diagnostic.

Most fractures in the cervical spine occur below C2. They range from fractures of the articular process to fractures of the vertebral body, lamina, spinous process and pedicle. Fractures are commonly classified in six groups depending (in order of frequency) on the forces that have acted on the cervical spine: compressive flexion, distractive flexion, compressive extension, vertical compression, distractive extension and lateral flexion. Neurological problems most often occur when the fracture is combined with luxation. Pathological fractures following a minor injury or a sudden effort give rise to the same clinical picture but the history is much less indicative and may even be misleading. If neurological injury is present, the diagnosis of a probable fracture or dislocation is made more simple.

**Clay-shoveller’s fracture**

This is a fracture of one or more spinous processes in the lower cervical or upper thoracic spine (mostly C7, sometimes C6 or T1).

A traction fracture may occur as the result of strong muscular force from the trapezius transmitted to the spinous processes through the musculature. It happens suddenly. A crack is felt followed by severe pain at the base of the neck and between the shoulders. The same event may occur in motor vehicle accidents where a strong flexion force is applied to the neck, and thus also in whiplash injuries.

If the fracture is the result of a fatigue mechanism, the patient complains of a dull ache at the cervicothoracic junction coming on without clear cause.

Neck movements are not really painful but the patient is unable to bring the arms above the horizontal because of pain. The passive shoulder range is full and painless. The radiograph shows avulsion of one or more spinous processes.

Spontaneous cure takes 3–6 weeks.

**Bony tumours**

Primary bone tumours are uncommon. They represent only 0.4% of all tumours and cervical localization accounts for only 4.2% of the primary bone tumours of the spine. This is very much less than in the thoracic or lumbar spine.

Benign primary tumours occur more often in the first two decades of life, while malignant primary tumours more frequently affect adults. The incidence of malignant tumours increases significantly with age. In the cervical spine, even more than in other parts of the axial skeleton, metastatic lesions are much more frequent than primary tumours.

The symptoms may vary and include local heat, tenderness, neuralgic pain, root palsy, torticollis-like limitation of neck movements and myelopathy, although early in development the symptoms may mimic ordinary soft tissue lesions. Severe pain at night is often a hallmark of neoplasm.

The presence of one or more inconsistencies during history and/or functional examination is a warning sign and puts the examiner on guard (see Box 1). It is again mainly the clinical approach that suggests a serious disorder. Radiography – usually the first additional examination – is not always helpful, as it appears that more than 30% of the cancellous bone of the vertebral body must be destroyed before a plain X-ray becomes positive. More refined imaging such as CT scan, technetium scan, angiography and MRI confirms the diagnosis. A radiograph and CT scan of the chest or abdomen may be necessary in patients with unknown primary sites.

**Box 1**

**Warning signs for cervical tumour**

**History**

- Central neck pain becoming slowly worse
- Elderly person with rapidly increasing pain and/or stiffness of the neck
- Elderly person with neck pain for the first time
- Cord symptoms
- Dysphagia

**Examination**

- Full articular pattern occurring spontaneously over short period of time
- Gross limitation of rotations
- Wrong end-feel: muscle spasm, soggy, empty
- Resisted neck movements painful and weak
- Unusual weakness in the arm
  - Gross weakness in the absence of severe radicular pain,
  - bilateral weakness,
  - multiradicular weakness,
  - T1 palsy
  - Horner’s syndrome
  - Anaemia

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**Benign tumours**

The most common benign neoplasms affecting the cervical spine are, in order of frequency: osteoid osteoma, osteoblastoma, haemangioma, aneurysmal bone cyst, eosinophilic granuloma, giant cell tumour and osteochondroma. They can be found at any level, except C1, and are most common at C2, C4 and C7 levels.
Osteoid osteoma
This is the most frequent benign tumour in the cervical spine and appears in young adults, mostly males. It affects the cervical spine less frequently than the lumbar spine and is located in the pedicles and vertebral arches.

The typical symptom is persistent localized pain, especially at night, which can usually be relieved by salicylates. The pain sometimes radiates to the upper limb.

Surgical removal is curative.

Osteoblastoma
This tumour affects the cervical spine as frequently as it does the thoracic spine. It is more common in the lumbar spine. Young adults – males more frequently – are affected and the posterior elements of the vertebra are involved, which may lead to radiculopathy and myelopathy.

The neck pain is dull, especially at night and the normal lordosis may be reversed to produce a torticollis-like picture. Root and cord symptoms may mimic a disc protrusion, except that the patient is too young to have disc protrusion causing root or cord symptoms.

Excision usually leads to full recovery.

Haemangioma
This occurs most often in women in their fourth decade. It is common and usually has an asymptomatic development – one-quarter of all cases are in the cervical spine.

The tumour rarely gives rise to symptoms. Should it do so, localized pain progressing to cord symptoms is usual.

Treatment with low-dose radiation usually suffices.

Aneurysmal bone cyst
This is seen most frequently in children and young adults, mostly females (under 30 years old). Twenty-five per cent of spinal aneurysmal bone cysts are located in the cervical spine. It is a destructive tumour and is mostly localized in the neural arch but may also invade the vertebral body. As it expands, it may lead to root pain and even to compression of the spinal cord.

Excision and/or curettage and stabilization with bone grafts are indicated.

Eosinophilic granuloma
This is a variant of the systemic disorder, histiocytosis-X. The cervical spine can be affected in both children and adults, and the condition has a typical development. The vertebral body collapses, producing sudden pain and sometimes muscle spasm leading to torticollis. A patient with acute torticollis and a sudden onset who presents with pain, limitation and involuntary muscle spasm on careful passive examination should therefore be radiographed to exclude this disorder, which shows a ‘vertebra plana’.

The fracture may heal spontaneously. However, when the flattening is significant, neurological symptoms may follow; these are reversible when treatment is started without delay. Open biopsy, followed by immobilization and irradiation may be necessary.

Giant cell tumour
This is more frequent in the sacrum and the lumbar spine but may also affect the cervical spine. It seems to occur in younger patients (between 20 and 40 years old), especially women. It leads to destruction of the vertebral body and can later involve the posterior part of the vertebra.

It may cause pain in the neck but can also give rise to radicular symptoms.

Excision with bone grafting is the treatment of choice.

Osteochondroma
This occurs mostly in young adult males. When it affects the spine it is seldom symptomatic, except in the cervical region. There is slow progression but neural compression can develop.

The results of surgical excision are good.

Malignant tumours
The most common malignant neoplasms are: multiple myeloma, chordoma, solitary plasmacytoma, chondroma, chondrosarcoma, lymphoma, osteosarcoma, Ewing’s sarcoma and metastases.

The primary malignant tumours represent 6.3% of all primary bone tumours of the spine and occur mainly from middle age on, much more frequently in men than in women. They are found at all levels, except C1.

Multiple myeloma
This is the most frequent primary malignant tumour in the spine. It occurs more often in men, usually between 50 and 70 years of age. The patient’s main symptom in early cases is pain in the neck. Anaemia and cord symptoms soon follow.

The radiograph shows round lytic defects in the bone, without a surrounding sclerotic reaction. Pathological fractures may occur.

The treatment of choice is radiation and/or systemic chemotherapy. The outlook is poor.

Chordoma
This is an uncommon, locally invasive, slow-growing malignant neoplasm that arises from the vertebral or suboccipital remnants of the embryonic notochord. In 33–38% it occurs in the upper cervical vertebrae, especially C2, and is found most often in men aged between 50 and 70 years.

Central neck pain becoming slowly worse is a common symptom. After several months, movements become gradually limited, especially rotation, with a soggy end-feel on passive testing.

The tumour often extends anteriorly into the soft tissues and may then result in dysphagia, upper respiratory obstruction and Horner’s syndrome. Posterior extension may be accompanied by neurological complications, such as epidural spinal cord compression or cervical radiculopathy.

The classic radiological finding is an expanding osteolytic lesion. This life-threatening lesion is best treated surgically by radical resection and, if this fails, repetitive local debulking procedures may be used. The prognosis is bad.
Solitary plasmacytoma
This is a myeloma (plasma cell neoplasm) in a single vertebral body. The patient is over 60 years and complains of slowly progressing neck pain with muscle spasm. The prognosis is much more favourable than in patients with multiple myeloma.\textsuperscript{46} Collapse of the vertebral body and cord compression may result.

The treatment of choice is radiation.

Chondrosarcoma
This tumour usually occurs in patients aged between 40 and 60 years. It forms cartilaginous tissue in the vertebral body or in the neural arch where it leads to destruction of bone. In most cases a soft tissue mass also develops.

Lymphoma, osteosarcoma, Ewing’s sarcoma
Lymphoma presents either as a skeletal manifestation of a systemic disease or as an isolated tumour. It may involve the epidural space adjacent to the osseous spine. Complete recovery is only possible after total surgical excision.

Osteosarcoma and Ewing’s sarcoma are extremely uncommon in the spine. These tumours evolve rapidly and osteogenic sarcoma generates early metastases to the lung. Treatment is biopsy, chemotherapy and/or radiotherapy.

Metastases
Secondary deposits are the most common malignant tumours of the cervical spine, although this part of the vertebral column is the least affected, occurring in 8–20% of patients with known metastatic disease.\textsuperscript{47} Breast, lung, prostate, colon, kidney and thyroid are the most frequent sites of primaries.\textsuperscript{48} Metastases in the spine may pass unnoticed for a considerable time and are sometimes discovered during routine radiography.

In symptomatic cases, pain is the earliest and most prominent feature in 90%.\textsuperscript{49} Localized pain that starts spontaneously and becomes gradually worse, especially at night, is the most common picture of spinal metastases. It is axiomatic that a cancer patient who develops neck pain harbours a spinal metastasis until proven otherwise. If a patient presents with neck pain but has a history of a primary tumour, for example breast cancer, even a long time ago, metastases must be taken into consideration. Tumour-related pain is predominantly nocturnal or early morning pain and generally improves with activity during the day. This pain may be caused by inflammatory mediators or tumour stretching the perist of the vertebral body.\textsuperscript{50}

Neurologic symptoms and signs often begin with radiculopathy (nerve root symptoms) and are followed by myelopathy (spinal cord compression).

The clinical features differ depending on whether the lesion is localized at the upper cervical spine (C1-C3), the lower cervical spine (C4-C7) or the upper thoracic spine (T1-T3).\textsuperscript{51}

Upper cervical metastases
It may be difficult to detect bony tumours at this level. Some warning signs will probably be found, for example an elderly patient, who for the first time complains of neck pain or who describes rapidly increasing pain and stiffness of the neck coming on in the course of 1 or 2 months. On examination, a pronounced full articular pattern is found: active movements are very limited and, on passive testing, muscle spasm prevents every forced movement. Resisted movements are painful and weak. In the early stage the radiograph shows only arthrosis and osteophytes but the history and functional examination show the discrepancy between the actual signs and what is seen on the radiograph. Further imaging confirms the tentative diagnosis.

Lower cervical metastases
Diagnosis here is much easier. Warning signs in the history may suggest severe disease and the examination confirms this. A full articular pattern with gross limitation of movement with a spastic endfeel is present. The resisted movements may be painful and weak. The neurological examination of the upper limb may point to a manifest (or obvious) non-discal pattern: gross weakness in the absence of severe radicular pain; bilateral weakness; multiradicural involvement and palsy of different nerve roots. Also signs of cord compression may become present.

Upper thoracic metastases
Limitation of movement is difficult to detect and therefore the situation becomes clear clinically only where a bilateral root pain or root palsy occurs. It should be remembered that weakness of the intrinsic muscles of the hand due to a T1 root palsy is never caused by a disc protrusion. Especially if Homer’s syndrome is also present, a malignant condition is very probable: either a pulmonary sulcus neoplasm or a neoplasm in the upper thoracic vertebrae.

If vertebral metastases are suspected, further investigations are arranged.

Plain radiographs are often ordered as the first test to evaluate a patient with cancer who has neck pain, but are relatively poor screening tests for metastases. Visualization of a radiolucent defect on plain radiographs requires a 30% destruction of the vertebral body. Additionally, metastatic tumour often infiltrates the bone marrow of the vertebral body without destroying the cortical bone. Bone scan (99mTc-MDP) is more sensitive than plain radiographs for detecting spinal metastases. The advantage of bone scan is the ability to screen the entire skeleton with a single image. However, the sensitivity is not 100%: patients with rapidly progressive, destructive tumours may not be detected and bone scan is relatively insensitive for multiple myeloma and tumours confined to the bone marrow.\textsuperscript{52} It also has a low specificity for tumour: fractures, degenerative disease, and benign disorders of the spine (Schmorl’s nodes, haemangioma) all may be positive.\textsuperscript{53} Since MRI is widely available, it has become the most sensitive and specific modality for imaging spinal metastases. Sagittal screening images of the entire spine reveal bone, epidural and paraspinal tumour. The extent and degree of spinal cord compression can be readily appreciated.\textsuperscript{54}

The three treatment modalities presently available for spinal metastases are chemotherapy, radiotherapy and surgery (both radical tumour resection and laminectomy).
Rheumatoid arthritis and ankylosing spondylitis

Rheumatoid arthritis

Rheumatoid arthritis is as frequent in the cervical spine as it is uncommon in other parts of the spine and the atlantoaxial complex especially becomes affected. The frequency of involvement of the cervical spine is between 25% and 80% and the longer a patient has rheumatoid arthritis the more chance it has to reach the cervical level. As in other joints the bony, cartilaginous and ligamentous structures are destroyed and laxity and deformation result.

Anterior atlantoaxial subluxation is the most frequent complication – it occurs in 49% of patients and represents 65% of all cervical subluxations – and results from laxity of the transverse ligament of the atlas and/or the ligaments of the dens (alar ligaments/apical ligament). The subluxation is mostly anterior but may be lateral and occasionally posterior. When, on a flexion/extension radiograph, the distance between the anterior arch of the atlas and the odontoid process of the axis exceeds 3 mm, laxity is probable. More than 10 mm indicates gross instability and requires surgical stabilization. The spinal cord is seriously threatened at this stage, especially during flexion movements. This may in the end lead to spasticity, hyperreflexia (deep tendon reflexes), weakness, sensory loss and urinary problems. More recent reports show a tendency to rely more on the posterior atlantodental interval, the distance between the posterior arch of the atlas and the dens, which should be a minimum 14 mm.

If the destructive process reaches both the occipitoatlantal and atlantoaxial joint complexes, the odontoid process of the axis may protrude through the foramen magnum – cranial settling or vertical odontoid subluxation, which happens in 38% of rheumatoid patients. Later in the development, the atlantoaxial instability tends to decrease again, leaving the patient with only odontoid subluxation. The lower cervical nerves, the cardiorespiratory centre and pyramidal tracts may all become compressed. Mikulowski et al report that 10% of rheumatoid arthritis patients may die of compression of the brainstem which is unrecognized before death.

It is therefore important to do a radiographic evaluation of the cervical spine in all patients with rheumatoid arthritis, even when they are asymptomatic. Collins et al found that only 50% of patients with abnormalities on their radiographs had symptoms of their cervical disease.

The degree of odontoid protrusion can be measured on a lateral radiograph. A line is drawn between the posterior edge of the hard palate and the inferior border of the occiput (the McGregor line). If the tip of the odontoid process lies more than 4.5 mm above this line, cranial settling is present (Fig. 1). If these landmarks are not clear, the Fischgold and Metzger measurement can be used: on an anteroposterior open-mouth tomogram the digastric line is drawn (between the points where the mastoid processes join the base of the skull), and the tip of the dens should lie 1 cm or more below this, to be classed as normal.

Subaxial subluxation is less frequent (10–20% of patients) but may arise at several levels, especially C2–C3 and C3–C4. The laxity then occurs at the zygoapophyseal and uncovertebral joints and may result in compression of nerve root and/or vertebral artery, the latter leading to verteobasilar insufficiency and its consequent clinical features.

Many patients are asymptomatic. There may be a discrepancy between the degree of destruction or instability and the symptoms. Patients may be seen with slight instability and neurological problems only, whereas others may have significant laxity without neurological symptoms. Neurological dysfunction occurs in 7–34% of patients and may include brainstem, spinal cord and nerve roots.

The disorder may cause moderate pain in the neck. Involvement of the upper cervical joints gives rise to pain often felt in the upper neck, radiating bilaterally to the occipital, temporal, auricular and retro-orbital regions. Occasionally the patient may complain of a clunking sensation with flexion movements (Sharp’s and Purser’s sign).

On clinical examination a full articular pattern is found with a soggy or empty end-feel. This characteristic sensation immediately draws attention to the disorder. A clunking sensation on neck flexion indicates excessive movement between C1 and C2, as happens in atlantoaxial subluxation. The Sharp–Purser test may help to diagnose the condition; it appears to have a sensitivity of 69% and a specificity of 96% compared with radiological evidence. The patient sits on a chair. The examiner stands to one side and places the index finger on the spinous process of C2. The palm of the other hand lies on the patient’s forehead. An attempt is made to slide the head posteriorly and, if a slide between the spinous processes of C1 and C2 is felt, the test is positive.

Ankylosing spondylitis

When, late in its development, the disease reaches the cervical spine, this leads to increasing stiffness and limitation in all directions and, in the end, possibly to ankylosis in flexion. This happens in 75% of patients with a history of more than 16 years. The end-feel is hard and may ultimately become bone-to-bone. As long as this bone-hard end-feel is not present the pain can be controlled with slow gradual stretching manoeuvres.
The Cervical Spine

Invasion of the vertebral bodies or arches: carcinoma of the bronchus is the most common primary but other sources are the breast, prostate, gastrointestinal tract, thyroid and kidney.91

These tumours must be differentiated from benign and malignant bony tumours of the spine (see pp. e14–e16), although any intradural neoplasm may also perforate the dura mater to become extradural. Pyogenic and tuberculous abscesses in the epidural space give rise to similar symptoms and signs.

These space-occupying lesions in the spinal canal very commonly lead to radicular symptoms and signs: root pain quickly follows the original local neck pain and motor and sensory deficit supervenes. Very soon in their development, the spinal cord becomes compressed and transverse myelopathy occurs with bladder dysfunction and further progressive sensory and motor deficit (see pp. 165–168).

Intradural extramedullary tumours

These form almost two-thirds of all intradural neoplasms,92 of which meningiomas and neuromas are the most common. Neuromas (schwannomas and neurofibromas) are benign, slowly growing peripheral nerve-sheath tumours originating from Schwann cells. Schwannomas are composed entirely of Schwann cells, whilst neurofibromas contain Schwann cells, fibroblasts, perineurial cells, mast cells and axons in an extracellular matrix. Neuromas in the cervical spine are not as frequent as they are in the thoracic spine but are more frequent than in the lumbar spine.93 Sometimes the growing tumour develops a large extradural component that expands towards the outside of the spinal canal. These so-called dumbbell neuromas present a special entity and account for 15% of all cervical neuromas.94

These tumours show a tendency to present with radicular symptoms very much resembling those caused by a disc protrusion. The root pain is quite constant, slightly influenced by activity and worse at night.95 Of all patients with symptoms consistent with disc herniation, 1% have an intraspinal tumour.96

The ease of differential diagnosis from a cervical disc lesion may vary. In some it is quite easy, while in others it may be extremely difficult. Any of the following features should arouse suspicion (Table 1).

**Warning signs and symptoms in neuroma**

<table>
<thead>
<tr>
<th>Warning symptoms</th>
<th>Warning signs</th>
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<tbody>
<tr>
<td>Root pain, under the age of 30</td>
<td>Lhermitte’s sign</td>
</tr>
<tr>
<td>Increasing root pain over several months</td>
<td>Absence of articular signs</td>
</tr>
<tr>
<td>Primary onset of root pain</td>
<td>Pronounced muscle weakness (+3 or +4)</td>
</tr>
<tr>
<td>Coughing causes pain down the arm</td>
<td>Spinal cord signs</td>
</tr>
<tr>
<td>Bilateral root pain</td>
<td></td>
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</tbody>
</table>

Fig 2 • Location of intraspinal tumours of the cervical spine: 1, extradural tumours (metastases, abscesses); 2, intradural extramedullary tumours (meningiomas, neurofibromas, schwannomas, sarcomas, dermoids, epidermoids, angiomas); 3, intramedullary tumours (astrocytomas, ependymomas).
In recent times, modern neurosurgical techniques including biopsy and dural decompression, followed by radiotherapy.98,99,100 Procedures such as myelography and particularly MRI are very useful diagnostic modalities.98 They may be diffuse in nature. Anterior horn cell and corticospinal tract involvement lead to upper limb weakness with small hand muscles derived from more than one segment.

### Intramedullary tumours

Intramedullary spinal cord tumours are rare lesions, most frequently seen in children and young adults.101 The majority are ependymomas and astrocytomas. Most are of low histological grade and follow indolent clinical courses, their presentation pattern depending upon the tumour’s anatomical location, which poses diagnostic challenges. Most lesions occur in the cervicothoracic cord.102 The commonest symptom is pain which may be diffuse in nature. Anterior horn cell and corticospinal tract involvement lead to upper limb weakness with small hand muscle wasting and upper motor neurone signs in the legs.103

The traditional treatment of intramedullary tumours is biopsy and dural decompression, followed by radiotherapy. In recent times, modern neurosurgical techniques including ultrasonic aspiration, laser, evoked potential monitoring and intraoperative ultrasonography have become available facilitating safer attempts at radical excision.104 Aggressive tumour resection reduces chances of local tumour recurrence but carries risks of major postoperative neurological impairment.105

### Neurological conditions with positive signs on neck examination

Some specific neurological conditions can occur to give rise to symptoms that warrant a cervical examination. Positive signs will be found during the neurological examination of the upper limb. Possible conditions are:

- Mononeuritis of the long thoracic nerve: active elevation of the arm is grossly limited
- Mononeuritis of the spinal accessory nerve: active abduction and external rotation of the shoulder are weak
- Neuralgic amyotrophy: several muscles are weak at random.

These conditions are discussed extensively in the online chapter *Nerve lesions and entrapment neuropathies of the upper limb*.

### Visceral conditions

Lesions of the lung may give rise to pain felt in the shoulder or the upper thoracic area. In particular, pulmonary or visceral lesions interfering with the diaphragm (a C3–C4 structure) cause pain felt at the point of one shoulder. Heart diseases may give rise to multisegmental reference of pain, especially in the C3 dermatome, or to segmental reference of pain, felt locally in the upper thorax or down the inner aspect of the upper limb (T1–T2 dermatomes). Inflammation of the gallbladder may provoke symptoms in the scapular area. Mobility of the shoulder can become impaired as the result of the dense scarring which accompanies healed apical phthisis, limiting the mobility of the costocoracoid fascia.

### Shoulder girdle disorders causing cervicoscapular pain

- Posterior sternoclavicular syndrome
- Lesion of the first costotransverse joint.

Sternoclavicular arthritis (especially when the posterior fibres of the joint are affected) or a lesion of the first costotransverse joint may give rise to pain felt in the trapezius area and so are recognized during cervical examination. The former – posterior sternoclavicular syndrome – presents with pain on shrugging the shoulder and on full arm elevation. The latter gives rise to signs on three levels: cervical, shoulder girdle and shoulder.

In both cases the complete shoulder girdle examination must be done and is diagnostic. These conditions are discussed in detail in Chapter 23.

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**Table 1 Differential diagnosis of discoradicular interactions and neurofibroma/schwannoma in the cervical region**

<table>
<thead>
<tr>
<th>Discoradicular interactions</th>
<th>Neurofibroma/schwannoma</th>
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<tbody>
<tr>
<td><strong>Symptoms</strong></td>
<td></td>
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<tr>
<td>No root pain under 35 years</td>
<td>At any age</td>
</tr>
<tr>
<td>Root pain stabilizes after 2 months</td>
<td>Root pain continues to worsen after 6 months</td>
</tr>
<tr>
<td>Secondary posterolateral evolution</td>
<td>Primary posterolateral onset</td>
</tr>
<tr>
<td>Coughing may hurt in the scapular area</td>
<td>Coughing always hurts down the arm</td>
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<tr>
<td>Unilateral root pain</td>
<td>Unilateral root pain may become bilateral</td>
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<td>Paraesthesia felt distally</td>
<td>Paraesthesia is felt all over the body</td>
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<tr>
<td><strong>Signs</strong></td>
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<td>Articular signs</td>
<td>No articular signs</td>
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<tr>
<td>Slight segmental weakness</td>
<td>Unusual weakness</td>
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<tr>
<td>Symmetrical cord signs</td>
<td>Asymmetrical cord signs</td>
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References


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