Patients who present with pain in a joint may actually be experiencing referred pain from elsewhere. It is for this reason that Apley recommends examination of the joint above and below the apparent problem area. In the upper limb the cervical spine may be the source of a patient’s symptoms and this should always be considered in the differential diagnosis.

**Etiology**

When thinking about the C-spine there are a number of conditions that may be causing the patient’s symptoms. Any condition which causes nerve compression along its track may cause radicular symptoms including pain, numbness or altered sensation.

More significant and prolonged compression may result in the development of myelopathy. This affects the long tracts in the spinal cord. There is often a degree of congenital stenosis of the canal which makes the patient more susceptible to any other pathology which further narrows the canal. The common causes are disc herniation, spondylosis and trauma.

One of the commonest causes of neural compression in the cervical spine is soft disc prolapse, particularly in younger patients.
The T2 weighted MRI above shows a patient with a soft disc prolapse causing central cord compression at the C5/6 level.

In older patients cervical spondylosis is a common cause of compression which may begin as radiculopathy progressing in time to myelopathy. Degeneration leads to the development of osteophytes and calcification of structures in the canal such as the posterior longitudinal ligament.

The T2 weighted MRI scan above shows a patient with canal stenosis as a consequence of cervical spondylosis.

**History and Examination**

The best way to examine patients with neurological sounding symptoms in the upper limb is to start with the neck and work down. Examine the neck as described at the beginning of this book with the Apley system; look, feel and move. Positive findings may include exacerbation of arm symptoms on movement or midline pain on palpation down the spinous processes.

Patients with radiculopathy will usually complain of pain radiating down the arm in a dermatomal distribution. They also commonly complain of altered sensation with pins and needles or numbness. When examining them there may be no significant neurological deficit to find. The MRI scan is key in confirming the underlying pathology in these cases.
Myelopathy can be more difficult to diagnose as many of the signs and symptoms are varied and non-specific. Remember that cervical myelopathy may present with lower as well as upper limb symptoms. The classical presentation is a loss of balance with poor coordination, decreased finger dexterity, weakness, numbness and in severe cases paralysis. Pain is a symptom in many patients but it is important to remember that it may be absent which often leads to a delay in diagnosis. In older patients it often manifests with a rapid deterioration of gait and hand function.

Common presenting complains are: a heavy feeling in the legs, poor exercise tolerance, radiculopathy, poor fine motor skills, L’Hermitte’s phenomenon (intermittent electric shock sensations in the limbs, exacerbated by neck flexion) and numbness and tingling in the limbs.

Patients with myelopathy present with a number of clinical findings which are predominantly upper motor neuron signs. A list of the key examination findings is shown below:

- Weakness is more severe in the upper limbs.
- Gait is usually affected with an ataxic broad based gait.
- Hypertonia (increased muscle tone identified by passive movement).
- Hyperreflexia (exaggerated response to normal physiological reflexes).
- Ankle clonus (forced dorsiflexion at the ankle giving rise to sustained beats of clonus).
- Babinski sign (extension of the great toe on scratching of the sole).
- Hoffman's reflex (flicking of the terminal phalynx of the middle or ring finger causing concurrent flexion at the terminal phalynx of the thumb and index finger).

**Non Surgical Management**

For patients with cervical disc prolapse a period of non surgical management can be appropriate, where the pain is controlled and there are no significant motor or sensory disturbances. The natural history of disc prolapse is one of spontaneous remission over months to years as the disc dehydrates and atrophies.

In the case of myelopathy however, remission does not generally occur. Spondylotic degeneration usually causes progressive narrowing and compression of the central cord or the nerve roots. The rate of progression varies widely and cannot easily be predicted. Conservative management may therefore also be considered with relatively close follow up. Patients who are medically unfit for surgery can be managed in this way but decline in function is likely over time.

**Surgical Management**

Patients with soft cervical disc prolapse who present with symptoms of significant neural compression should be considered for surgical intervention. There are two broad options for these patients. Young patients without advanced spondylotic changes can have a cervical disc replacement which allows some mobility to remain in the disc space. The advantage of this is that is potentially reduces the risk of degeneration in the segments above and below though it is a relatively new procedure and long term results are not available.
The x-ray above shows a cervical disc replacement between C5 and C6.

Older patients or those with spondylotic changes are usually more suitable for decompression and fusion. This can also be performed in patients with multilevel disease as cervical disc replacement is not currently approved for multiple levels.
The x-ray above shows a post operative x-ray for a patient who has undergone anterior decompression and interbody at C5/6 and C6/7. The so called cage which aids fusion can be seen in the disc spaces and the plate on the front is to protect the levels until they have fused. Both of these operations are performed through the anterior approach to the cervical spine, ie through the front of the neck.

A posterior approach can also be utilised as is more commonly seen in the lumbar spine. There are a number of posterior surgical options which are used when the compression is caused primarily by posterior structures such as an ossified posterior longitudinal ligament.
The x-ray above shows a posterior decompression of C3 - C6 with instrumented fusion.

When to Refer

Patients with suspected or confirmed c-spine pathology should be referred to the spinal outpatients for assessment of suitability for surgical intervention. Because of the complexity of diagnosis in the region an MRI showing cord or nerve root compression is mandatory, although a plain x-ray or CT will more accurately indicate the bony extent of degenerative disease.

Patients with myelopathy on examination should always be referred as the condition is almost always progressive and it is preferable for the patient to be assessed by the spinal team.