CERVICAL SPINE RESEARCH SOCIETY

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PATIENT RESOURCES

Neck Pain

Neck pain is a common condition that can affect more than 30% of the general population every year. In fact, it is the fourth leading cause of disability behind lower back pain, depression, and arthralgias (joint pain). Approximately half of all individuals will experience a noticeable neck pain episode over the course of their lifetime. More women than men have neck pain, and it peaks during the middle aged years (40-60 years).

Who Gets Neck Pain?

Individuals who get neck pain tend to have other muscle and bone conditions. Unique risk factors for neck pain include trauma (e.g. traumatic brain and whiplash injuries) and certain sports injuries (e.g. wrestling, ice hockey, football). However, many patients without risk factors can still get neck pain.

Different Causes of Neck Pain

There are different ways of categorizing neck pain. One method is according to the duration of pain, in which the duration of pain can be divided into three phases: acute (less than 6 weeks), subacute (less than 3 months), and chronic (more than 3 months). Duration is important because the shorter the duration of neck pain, the better the prognosis, or the likely outcome. Most cases of acute neck pain will resolve to a large extent within 2 months.

Neck pain can also be categorized by how and why it happens. "Mechanical" pain refers to pain originating from spinal structures such as discs or joints (Figure 1). When discs degenerate, they can sometimes be associated with neck pain (Figure 2). Similarly, the facet joints in the spine can cause neck pain when they degenerate and produce arthritic changes (Figure 3). However, it is important to understand that degenerative changes within discs and facet joints are universal in everyone with increasing age, and their mere presence on an x-ray or MRI does not necessarily mean that they are the cause of the pain. Other causes of mechanical neck pain include strains and sprains of the muscles and ligaments that surround the cervical spine.

Compression of neurologic structures, such as the spinal cord or nerve roots, can also cause isolated neck pain (Figure 4). However, in addition to neck pain alone, compression of neurologic structures within the cervical spine is often (but not always) associated with other neurologic symptoms, such as radiating pain down the arm, numbness, weakness, difficulty controlling the arms, or difficulty with gait and balance. Differentiating pain arising from neurologic compression from mechanical pain is important since the treatment may be different.

Other causes of neck pain include tumors/cancers, infections, and certain fractures. These causes are relatively rare compared to the mechanical causes, but require more urgent attention. A deformity of the cervical spine, such as kyphosis (an abnormal amount forward bending of the neck) can also cause neck pain (Figure 5).

Non-spinal causes of neck pain can also occur. For example, sometimes a heart attack can manifest itself as neck pain with spread of that pain to the left arm. Problems in and around the shoulder joint can cause neck pain near the shoulder.

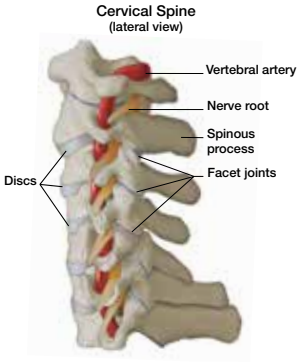

Figure 1. *Demonstrates a healthy intervertebral disc and facet*

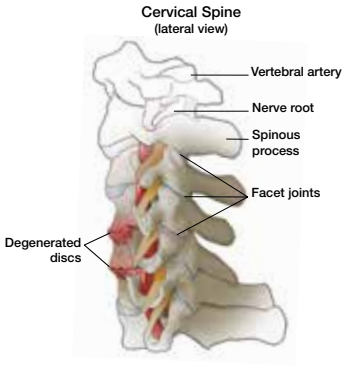

Figure 2. Demonstrates an arthritic ("degenerative") intervertebral disc

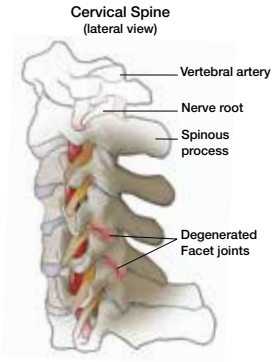

Figure 3. Demonstrates an arthritic ("degenerative") facet joint

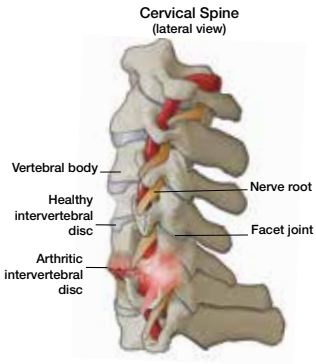

Figure 4. Demonstrates a compressed nerve root. Most commonly, this compression occurs from a degenerative disc producing a bone spur or herniated disc material

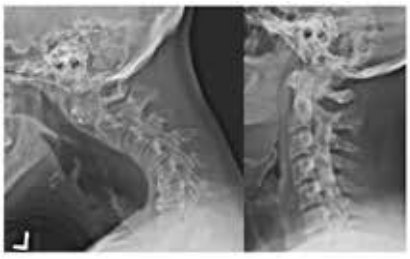

Figure 5. The left x-ray demonstrates a patient with cervical kyphosis, or an abnormal forward bend of the neck. The right x-ray shows a different patient with a more normal "lordotic" (ie, "backward") bend of the neck

Evaluation of Neck Pain

A comprehensive history can provide important clues regarding the cause of neck pain and help distinguish mechanical neck pain from other causes. Upon completion of history taking, a detailed physical and neurologic examination is performed to confirm findings from the history, identify serious or treatable causes, and make plans for further testing, if needed.

Depending on the circumstances, imaging and other diagnostic studies may be ordered. Not every case of neck pain requires imaging, and, even when imaging is indicated, not every type of imaging modality needs to be obtained.

Radiographs ("x-rays") may reveal evidence of disc degeneration, with collapse of the disc spaces and bone spur formation, as well as diagnose many fractures. The side ("lateral") radiograph allows for examination of the facet joints in the back of the neck, again looking for bone spur formation. X-rays also can also show the presence of kyphosis. In addition, special x-rays taken with the neck in full forward flexion and then in full backward extension may demonstrate any instability or abnormal movement of the cervical spine.

Further imaging with magnetic resonance imaging (MRI) may be requested in some cases. Cases of neck pain accompanied by neurologic symptoms (e.g. arm pain, numbness, weakness, etc.) may require MRI to evaluate for spinal cord compression or nerve root compression. In cases of purely isolated neck pain without neurological complaints, an MRI may not add much to the diagnosis and treatment and, as such, may not be ordered. Similarly, computed tomography (CT) scans may be ordered to evaluate for changes to the shape or architecture of the bone in the cervical spine. In general, MRI is useful for examining soft tissues and nerves, whereas CT is more useful for examining bone. CT is associated with some radiation exposure to the patient, so these are often withheld unless definitely needed.

In some cases, the actual cause of the neck pain may not be clear even after history, physical, and imaging have been obtained. If so, and the symptoms have not gone away with time or routine symptomatic care, different types of spinal injections may be recommended in order to identify the source of pain. For example, facet joint injections (aka "blocks") may be directed to the facet joint(s) felt to be the culprit for pain. If the injection provides either temporary or long lasting relief, then the cause of the pain is likely to be the injected joint(s). Trigger point injections can be given into muscular areas of pain - they can offer similar diagnostic information and potentially relieve pain long term as well. Epidural steroid injections and nerve root injections are usually performed in patients with associated neurologic symptoms, but they may sometimes be recommended in patients with isolated neck pain as well.

Blood tests are not commonly employed in the diagnostic workup of neck pain but may be ordered when tumor, infection, or inflammatory disease (e.g. rheumatoid arthritis) are suspected. Similarly, electromyograms (EMG/"nerve conduction study") are rarely obtained for isolated neck pain in the absence of neurologic symptoms.

Treatment

Although it will depend on the underlying diagnosis, statistically speaking, the vast majority of patients with isolated neck pain will improve spontaneously over time or with nonoperative treatment. Therefore, for the majority of patients with isolated neck pain and no neurological symptoms, non surgical management is generally the rule of thumb.

A short course of rest is almost always appropriate for an acute episode of neck pain. Physical therapy and exercise may be prescribed to improve muscle strength and endurance which can help reduce pain. Traction may be used by the therapist as well. Standard over-the-counter pain relievers such as acetaminophen and nonsteroidal anti-inflammatory drugs (NSAID) are frequently prescribed. Because NSAIDs may require time to diminish inflammation and therefore improve pain, several weeks of administration may be needed. Oral steroids (e.g. prednisone) and muscle relaxants can be used, though these should be administered and used with care. Opioids are not recommended as a long term option for pain control and should generally be avoided.

As noted above, facet injections can be used to identify the cause of pain and, once confirmed, be used to treat pain as well. When a facet joint injection has proved useful for pain relief, but the duration is relief is short, then radiofrequency ablation (RFA) is an option to "burn" the sensory nerve going to the joint. Although these small sensory nerves have no effect on arm function at all, they can regrow over time, and thus repeat RFA may be needed if the pain returns. Epidural steroid injections are generally used in patients with co-existing nerve pain running into the shoulder and arm, less so with those having isolated neck pain only. Acupuncture remains under investigation. While theoretically safe, the benefits of acupuncture have not been definitively proven to date. Chiropractic is often sought by those with neck pain. Although generally safe, rare but serious complications have been reported with chiropractic manipulation.

Cervical collars may be helpful short term (e.g. a week or two at most) for acute neck pain associated with muscle spasms or whiplash injuries. Because prolonged immobilization may lead to muscle weakness and worsen rather than improve pain, the period of immobilization should be short term only. Cervical traction collars may provide temporary relief as well.

Surgery is rarely indicated for isolated neck pain without radiculopathy or myelopathy (ie, problems associated with nerve root and/or spinal cord compression). Exceptions may include spinal tumors, infections, certain fracture types, or severe deformity (usually severe kyphosis), all of which may require surgery for isolated neck pain even in the absence of neurologic compression or neurologic symptoms. Non-fusion (or "nonunion") of a prior cervical spine surgery is another condition that may benefit from surgery even if there are no neurologic symptoms.

Historically, cervical spine surgery performed purely for isolated neck pain due to most degenerative conditions without neurologic compression has had a low overall success rate. While some patients may attain pain relief, it is often incomplete and insufficient. Many note no improvement or even worsening of neck pain. For these reasons, surgery is generally not the best option for the vast majority of patients with isolated neck pain due to degenerative causes in the absence of neurologic symptoms, even if non-surgical care has not helped sufficiently. However, to be clear and to reiterate once again, the cause of neck pain is of paramount importance in determining the appropriateness of surgery: neck pain associated with neurologic symptoms (see materials on "What is cervical radiculopathy" and "What is cervical myelopathy"), tumors, infections, certain fracture types, nonunion of prior surgery, or significant kyphosis may require and benefit greatly from cervical spine surgery.

About CSRS

The Cervical Spine Research Society is a multidisciplinary organization of individuals interested in clinical and research problems of the cervical spine. Its purpose is to provide a forum for the exchange and development of ideas and philosophy regarding the diagnosis and treatment of cervical spine injury and disease. The organization values collegial interaction and strong scientific principles. Founded in 1973, the CSRS is the internationally recognized authority focused on the research and education of cervical spine disorders.

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