

Definition

Cervical facet joints are comprised of the inferior articular process and the corresponding superior articular process that arise from the lateral masses of adjacent vertebral bodies. They are diarthrodial synovial joints surrounded by a fibrous joint capsule, which contains articular cartilage and menisci. The cervical facet joints are positioned at about 45° from the transverse plane and 85° from the sagittal plane, although they assume a more vertical position with descent into the thoracic region [1]. The fibrous joint capsule may be directly involved as a pain generator as substance P and calcitonin gene-related peptide (CGRP) have been found in the capsule [2]. Additionally, the capsule is innervated by mechanoreceptors I, II, and III and may promote muscular reflexes aimed at slowing degeneration and preventing instability.

Innervation of the occipitoatlantal (C1) and atlantoaxial joints (C2) are supplied by the ventral rami of the first and second cervical spinal nerves. The C2–C3 facet joint is supplied by the third cervical spinal nerve dorsal rami (communicating branch and medial branch/third occipital nerve). The remaining facet joints, C3–C4 through C7–T1, are supplied by the dorsal rami medial branch one level above and below the joint [3].

Diagnosis

The cervical facet joints have been found to be a pain generator. For most cases proper history taking coupled with a good physical examination and oftentimes imaging can clue a provider into the proper diagnosis. Oftentimes, but not always, patients with cervical facet joint pain present with a history

of dull, aching axial neck pain. They may also have limited range of motion, headaches, and/or radiation to the shoulder, occiput, or back. The pain referral patterns have been mapped out for each facet joint (Fig. 77.1) and may be helpful in localizing the particular pain generating facet joint.

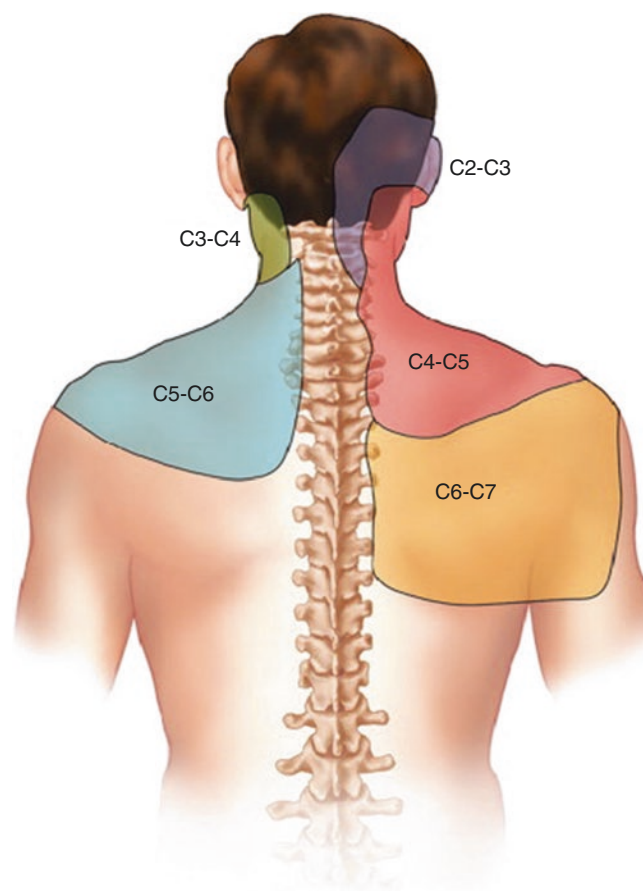


Fig. 77.1 Cervical facet pain referral patterns (Reproduced from *Current Pain and Headache Reports*, 14(6), 2010, Cervical facet arthropathy and occipital neuralgia: headache, Hoppenfield JD. With kind permission from Springer Science and Business Media)

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Physical Examination

- If the pain generator is solely the facet joint, there will be no neurological findings.
- Maneuvers that load the cervical facet including cervical extension with rotation should be performed and considered positive if the pain is reproduced.
- There may be associated paraspinal muscle tenderness to palpation.

Differential Diagnoses

- Cervical discogenic pain
- Cervical radiculopathy
- Cervical vertebral fracture
- Cervical spine strain/sprain

Imaging

- Plain radiographs of the cervical neck in the neutral, flexed, and extended positions as well as MRI and CT can show degenerative changes and increased laxity; however, these findings may be found in asymptomatic patients.
- Single-photon emission computed tomography (SPECT) has been used to determine good candidates for intra-articular facet joint injection in the lumbar and cervical region [4].
- Additionally, the use of bone scan fusion with SPECT digitally combined with a CT scan, known as a FireScan, has been used to highlight increased areas of bone turnover. With the sensitivity of a bone scan and the specificity of a CT scan, this imaging technique improves diagnostic accuracy and may help predict response to facet injection [5].
- Imaging abnormalities must be coupled with patient history and physical exam in order to consider clinical significance.
- Diagnostic injection blocks are considered the best way to diagnose facet joint pain and are also a treatment option.

Conservative Treatment

- Treatment should start with patient education especially as related to posture, movement, and head position.
- Physical therapy interventions for facet joint dysfunction include manual therapeutic techniques, heating and cooling modalities, therapeutic exercises, and neuromuscular reeducation.
- Pharmacological therapy is aimed at reducing inflammation with NSAIDs and acetaminophen being first-line agents.
- Tricyclic antidepressants may be utilized as nighttime adjuncts [6].

- Muscle relaxants may be used to treat secondary muscle spasm.
- If the painful symptoms are controlled, a home exercise program with emphasis on stretching and strengthening can be started, with the goal of obtaining a neutral spine position and preventing future relapses of pain.
- Acupuncture has also been shown to provide pain relief comparable to noninterventional treatments [7].

Interventional Treatment

- Blockage of the pain signal by medial branch block (MBB) or intra-articular injection using local anesthetic can identify a pain generator, a positive response defined as pain relief lasting the duration of anesthetic action.
- MBB locally anesthetizes the medial branch nerves that innervate the facet joint. It is important to note that some people have aberrant innervation of their facet joints, which may hinder pain improvement through this approach [8].
- Intra-articular injections can be diagnostic with anesthetic alone or therapeutic with anesthetic and steroid.
- If the block is diagnostic and only anesthetic is used, typically lidocaine or bupivacaine, the anesthetic effect will only last a few hours. This is opposed to a therapeutic injection with the addition of steroid to the anesthetic which would give a longer-lasting period of pain relief.
- Comparative local anesthesia injections, or double blocks, which utilize two different anesthetics with varying half-lives can be used to reduce the false-positive rates associated with single blocks [9].
- Using a double-block paradigm, the first agent is administered, followed by a minimum of 2 weeks, at which point the second agent is injected. Favorable responses to both blocks, of different half-lives, increase the likelihood of the facet joint being the pain generator.
- Percutaneous radiofrequency neurotomy aims to ablate the facet joint's dorsal rami medial branches.
- Proper needle placement is performed by positioning the needle over the medial branches and performing motor and sensory stimulations to confirm position. Local anesthetic is then injected adjacent to the nerve after which point high temperatures are delivered to the nerve with the probe.
- Pulsed radiofrequency ablation was shown to have a decrease in pain relief from 1 year with continuous ablation to about 4 months [3].

Surgical Treatment

- Spinal fusion: an option if conservative measures are unsuccessful

Referral

- Physiatry early on to employ a comprehensive conservative approach with the aim to maximize management with oral and topic agents, initiate therapy with modalities, and counsel on proper body positioning
- Pain management when conservative treatment fails and the patient remains in significant pain with impairments in functionality, with the need for possible interventional procedures

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