Nontraumatic Cervical Spine for Primary Care Providers

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ABSTRACT

Musculoskeletal complaints continue to be one of the most common reasons patients seek treatment from primary care providers. In particular, spinal complaints are becoming more common with the aging population. In this study I review the epidemiology and anatomy of the cervical spine. The findings reinforce the need for a thorough exam and provide the reader with information on how to examine a patient with cervical spine–related complaints. Numerous guides and pearls will be shared as well as several videos to help the nurse practitioner become more comfortable in treating cervical spine pathology.

Keywords: cervical spine, degenerative, myelopathy

EPIDEMIOLOGY

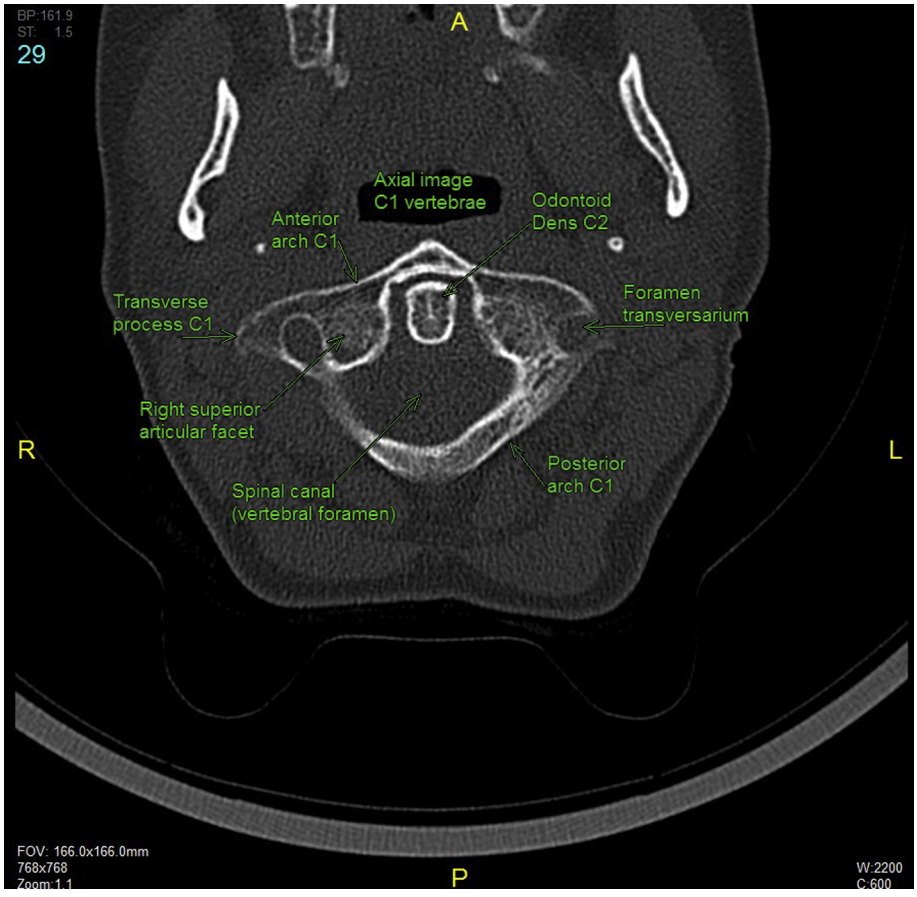
Neck pain is a common problem in our society and at any given time affects about 10% of the general population. The actual cause of the problem is frequently difficult to determine. Neck pain can be divided into 2 main etiologies: degenerative and traumatic. However, other less common causes exist, such as infection and autoimmune disorders. In up to one third of patients with neck pain, the condition is not self-limiting and may produce moderate long-term disabilities.[1] Of 291 conditions identified in the Global Burden of Disease 2010 Study, neck pain ranked 4th highest in terms of disability, as measured by years lived with disability and 21st in terms of overall burden.[2] The prevalence of neck pain varies significantly from 12.1% to 71.5%, based on the study reviewed. Bovim et al. showed an overall prevalence of neck pain of 34.4%, with 13.8% of patients reporting neck pain lasting > 6 months.[3] Most providers agree that neck pain lasting > 6 months may be considered chronic. Cervical spine problems affect women more than men when studied by the United States Centers for Disease Control. In males ≥ 18 years of age, the presence of neck pain over a 3-month period was 13.7% and in females it was 18%. Further, the survey also suggested that socioeconomics would have some impact on the risk of neck disorders. In that same population, patients 100% below the poverty line reported neck pain 20.8% of the time, whereas those 400% above the poverty line reported neck pain only 13.1% when surveyed.[4]

ANATOMY

The cervical spine is made of 7 vertebrae (C1-C7) from the base of the skull (C0) to the top of the thoracic spine. The top 2 vertebrae, C1 and C2, are very unique when compared with the remaining cervical vertebrae. C1, also known as the atlas, is a ring-shaped bone that articulates with the cranium. Sixty percent of flexion and extension occur through the C1 vertebral body. This articulation takes place on the lateral masses of C1 and the occipital condyles of the cranium. C1 is also different in that it does not have a true vertebral body or a true spinous process. The atlas is where the vertebral artery leaves the foramen transversarium and crosses over the ring of C1 to enter into the base of the skull to become the basilar artery. Figure 1 illustrates the anatomy.

C2 is also known as the axis, as its shape allows for rotation when turning the head to answer "no." Fifty percent of the rotation that occurs in the neck is through C1-C2 articulation, as seen on the coronal image in Figure 2. The hallmark structure of C2 is the odontoid process, also called the dens. This is a postlike, bony component that projects cephalad

Figure 1. CT Axial Image of the Ring of C1.



from the vertebral body. The dens articulates with the anterior aspect of the C1 ring and is held in place with multiple, very strong ligamentous structures. C2 is the first of the cervical vertebrae to have a true spinous process, which is often bifurcated. C2 is similar to the other vertebrae and has a foramen transversarium bilaterally, which is coursed through by the vertebral artery.

C3-C6 vertebrae are very similar in anatomy. Each of these vertebrae has a vertebral body, spinous process (some bifid some not), very small transverse process, foramen transversarium, vertebral foramen, uncinate process, as well as a superior and inferior articular processes (facet joint), as shown in Figure 3.

C7, the last of the cervical vertebrae, is characterized by a long spinous process and can generally be palpated as a landmark in 70% of patients.[5]

PHYSICAL EXAM

The examination begins by observing the patient when entering the exam room. The way the patient ambulates (gait, stride, steadiness, widened stance, assistive devices) can be very helpful in diagnosing pathology. An antalgic gait could be from guarding of an extremity and a wide-based gait may suggest myelopathy. Observing how the patient positions themselves before the exam can also be beneficial. For example, is the patient grimacing with movement? Do they have their arm over their head? Are they rubbing their neck or arm while you are speaking? These answers may give the provider insight into the cause of the problem. The provider should inspect the overall alignment of the neck for asymmetry in the coronal or sagittal planes (extreme kyphosis or lordosis). Aside from posture and gait, it is important to look for any involuntary movement,