Archives of Orthopedics and Rheumatology

ISSN: 2639-3654

Volume 2, Issue 2, 2019, PP: 01-02

Surgical Anatomical Notes Related to the First and Second Cervical Vertebrae

Dr. Behzad Saberi, MD

Medical Research, Esfahan, Iran.

sab64b@yahoo.com

***Corresponding Author:** Dr. Behzad Saberi, MD, Medical Research, Esfahan, Iran.*

The first vertebra has unique anatomical characteristics. The Atlas bone supports the globe of the head which is anatomically a ring of bone and does not have any body. It has an anterior and a posterior arch, two lateral masses and pedicles. Via the anterior tubercle, the anterior arch is attached to the longus colli muscles. The fovea dentis of the anterior arch is a place which the odontoid process of the second vertebra will be located at that. Rectus capitis posterior minor muscles and the posterior atlanto-occipital membrane, attach to the posterior tubercle over the posterior midline. Vertebral arteries are located in a sulcus at the upper aspect of the posterior arch which is named sulcus arteriae vertebralis. The lateral masses which their direction is upwardly, medially and backwardly and form a shape like a cup, articulate with occipital condyles and have large, concave surfaces in the superior aspect. Superior articulating facet of the second vertebrae, articulates with the inferior surfaces of the Atlas which are circular. Zygapophyseal joints are formed by this articulation. Movements like side-bending, flexion, extension and rotations are allowed by this articulation.

The first and second cervical vertebrae articulate with each other and form the atlantoaxial joint which by odontoid process facilitation, rotating in a transverse plane would be possible. The transverse process is the point of attachment for some muscles like the superior obliques, splenius cervicis, lateral scapulae, scalenus medius and the inferior obliques. Transverse foramina are within the transverse processes.

There are three synovial joints in the atlantoaxial articulation, a central articulation and two lateral mass articulations. The central articulation is between the dense, anterior arch of the first cervical vertebrae and the transverse ligament. The transverse ligament divides the vertebral foramen into the anterior and posterior parts and has the most important role in the first and second cervical vertebrae level stabilization.

Cruciform ligament consists of two longitudinal fasciculi, the superior one which would be extended to reach the foramen magnum and the inferior one which would be extended to reach the axis. Alar ligaments, apical ligament and anterior and posterior atlantoaxial ligaments are the other important ligaments in this area.

Knowing the precise anatomy of the first and second vertebrae and surrounding structures, makes surgical approaches to the pathologies of the area more accurate with lowest surgical complications.

References

[1] Panjabi MM, Oda T, Crisco JJ III, Oxland TR, Katz L, Nolte LP. Experimental study of atlas injuries. I. Biomechanical analysis of their mechanisms and fracture patterns. Spine 1991; 16 (10, Suppl): S460–S465

[2] Hadley MN, Dickman CA, Browner CM, Sonntag VK. Acute axis fractures:a review of 229 cases. J Neurosurg 1989; 71 (5 Pt 1): 642–647

[3] Fielding JW, Cochran GB, Lawsing JF III, Hohl M. Tears of the transverse ligament of the atlas. A clinical and biomechanical study. J Bone Joint Surg Am 1974; 56 (8): 1683–1691

[4] Gehweiler JA Jr, Daffner RH, Roberts LJ Jr. Malformations of the atlas vertebra simulating the Jefferson fracture. AJR Am J Roentgenol 1983; 140 (6): 1083–1086

[5] Oda T, Panjabi MM, Crisco JJ III, Oxland TR, Katz L, Nolte LP. Experimental study of atlas injuries. II. Relevance to clinical diagnosis and treatment.

Spine 1991; 16 (10, Suppl): S466–S473

[6] Dorne HL, Lander PH. CT recognition of anomalies of the posterior arch of the atlas vertebra: differentiation from fracture. AJNR Am J Neuroradiol 1986; 7 (1): 176–177

[7] Garber JN. Abnormalities of the atlas and axis vertebrae: congenital and traumatic. J Bone Joint Surg Am 1964; 46: 1782–1791

Citation: **Behzad Saberi.** *Surgical Anatomical Notes Related to the First and Second Cervical Vertebrae. Archives of Orthopedics and Rheumatology. 2019; 2(2): 01-02.*