Upper Cervical Spine

see Craniocervical junction.

The upper cervical spine refers to the topmost segment of the vertebral column and includes the first two cervical vertebrae: the atlas (C1) and the axis (C2). This region is distinct in its anatomy and function compared to the rest of the spine and plays a critical role in supporting the head, facilitating a wide range of head movements, and protecting the spinal cord and vertebral arteries.

Traumatic injuries, degenerative/rheumatologic conditions, tumors, or infections of the upper cervical spine may in certain circumstances require surgical stabilization.

C1 lateral mass screws (Harms technique) in combination with C2 instrumentation (pars, pedicle, translaminar screws) have become a mainstay of surgical treatment. The surgical anatomy of the C1 lateral mass can be challenging especially with the robust venous plexus that often causes significant bleeding with exposure of the C1-C2 articular complex [1].

see Upper cervical spine fracture.

see Upper cervical spinal epidural abscess.

Surgical exposure of the upper cervical spine is challenging, and optima approaches are subjects of debate. The high anterior cervical approach to the upper cervical spine is a favorable method that provides direct and wide exposure for fusion and anterior decompression of the upper cervical spine. The authors present their experiences with 15 patients in whom fusion and instrumentation on the upper cervical spine were performed via the prevascular extraoral retropharyngeal approach.

METHODS: A series of 15 patients who were surgically treated using the high anterior cervical retropharyngeal approach was reviewed. These cases involved a C2 hangman's fracture with significant angulation and translation (11 patients), C2 EDH (1 patient), C2 chordoma (1 patient), C3-4 metastases (1 patient), and C2-3-4 OPLL (1 patient).

Twelve patients underwent C2-3 fusion followed by instrumentation. C2-5 fusion with instrumentation was performed in 2 patients. One patient experienced occipitocervical fusion after anterior removal of a C2 chordoma. A solid fusion was achieved in 13 patients. However, 1 patient needed additional posterior fusion because of fusion failure, and the other died due to ischemic heart disease. There was 1 patient who developed permanent dysphagia related to the hypoglossal nerve and 2 who had transient dysphagia. No complications occurred related to the marginal branch of the facial nerve or submandibular gland.

The high anterior cervical approach is a useful surgical technique for an upper cervical lesion without severe morbidity, which allows direct anterior access to C2 and C3 while allowing extension to the lower cervical spine [2].

1)
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2)
Park SH, Sung JK, Lee SH, Park J, Hwang JH, Hwang SK. High anterior cervical approach to the upper cervical spine. Surg Neurol. 2007 Nov;68(5):519-24; discussion 524. Epub 2007 Sep 6. PubMed PMID: 17825365.