Cranio-cervical Tumors In Children: Surgical Consideration

Ibrahim Alnaami MD, MSc, FRCSC,
Assistant Professor, Adult, Pediatric Neurosurgery, Interventional Neuroradiology,
King Khalid University, Aseer Central Hospital, Abha
Director, Neurosurgery Training Program, Aseer Central Hospital,
Head, Pediatric Neurosurgery, Abha Maternity And Children Hospital,
Chairman, Department Of Anatomy, King Khalid University, Abha
Disclosures

• NONE
Outlines

• CVJ anatomy
• History
• Epidemiology
• Approaches
• Surgical considerations
What is CVJ?

funnel-shaped structure comprised of the clivus and foramen magnum and the upper two cervical vertebrae.
TUMORS OF THE UPPER CERVICAL CORD *
BY I. ABRAHAMSON, M.D., AND M. GROSSMAN, M.D.
NEW YORK CITY

A spinal cord tumor may press upon an inextensible bony canal, compressing the adjacent structures which that canal contains in the order of their compressibility.

Variations in the pressure of the cerebrospinal fluid may occur without symptoms, indicating that a considerable alteration of pressure may take place within the bony canal without detectably affecting the function of the contained structures. But beyond a given point increase of that pressure is accompanied by diffuse pain, which is relieved by withdrawal of the fluid, and is, therefore, attributable to its pressure. This pain is not a root pain; it affects sections rather than root areas, and is probably of sympathetic origin. In tumors of the cervical cord this pain occurs in the neck or over the occiput. The pain is relieved by lying down, for the pressure of the fluid increases with the angle of the vertebral column to the horizon.

Besides such general increase of intraspinal pressure, spinal tumors cause a local increase of pressure at their site. Where this local pressure occurs the structures are primarily affected; in part according to their proximity to the pressure area, in part according to their immobility, and in part according to their compressibility.

The more immediate application of the pressure the greater the compression. But to this axiom several exceptions must be made. The cerebrospinal fluid constitutes a fluid protective system surrounding the cord. The pressure in such a system tends to equalize itself so long as there is fluid continuity throughout the system. Local pressures of extradural tumors will therefore tend to be diffused and minimized until the pressure of the tumor exceeds the pressure of the cerebrospinal fluid, and obstructs the system at the pressure area.

When the tumor obstructs the system, the fluid below the obstruction may decrease in quantity and increase in albumin content; it may become a pressure fluid rich in albumin, or may contain exudations.

*A Report of Cases Read at the Forty-Seventh Annual Meeting of the American Neurological Association, Atlantic City, June, 1921.
Pediatric Cranio-cervical Tumors (PCCJT)
Pediatric Cranio-vertebral Tumors (PCVJT)

Table 1: Type of craniovertebral junction tumor in children requiring surgery by author (1991–2006)

<table>
<thead>
<tr>
<th>Tumor type</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chordoma</td>
<td>8</td>
</tr>
<tr>
<td>Fibrous dysplasia</td>
<td>4</td>
</tr>
<tr>
<td>Aneurysmal bone cyst</td>
<td>4</td>
</tr>
<tr>
<td>Eosinophilic granuloma</td>
<td>4</td>
</tr>
<tr>
<td>Ewing’s sarcoma</td>
<td>2</td>
</tr>
<tr>
<td>Osteoblastoma</td>
<td>2</td>
</tr>
<tr>
<td>Neurenteric cyst</td>
<td>4</td>
</tr>
<tr>
<td>Meningioma</td>
<td>5</td>
</tr>
<tr>
<td>Schwannoma</td>
<td>2</td>
</tr>
<tr>
<td>Plexiform neurofibroma</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
</tr>
</tbody>
</table>
Clinical presentations

• 3 classes
  • Intracranial lesions
  • Straddle lesions
  • High cervical cord lesions
List of Surgical Approaches

- Trans oral transpalatopharyngeal
- Transethmoidal
- Trans basal
- Transfacial
- Lateral extrapharyngeal transcervical
- Dorsolateral far lateral
- Midline suboccipital
- Endoscopic endonasal
- Lateral infratemporal

*Youmans neurological surgery, 6th edition, Ch.308 by Menezes*
Transoral transpalatopharyngeal

Surgical approaches: postoperative care and complications “transoral–transpalatopharyngeal approach to the craniocervical junction”

Arnold H. Menezes
Dorsolateral far lateral
Cranio cervical fixation
Endoscopic Endonasal
Surgery

- Preoperative
- Perioperative
- Post Operative
Preoperative tips

- Study your images very well.
- Choose your approach.
- Discuss it with colleagues.
- Sleep well.
PERIOPERATIVE

• Communicate with anesthetist.
• Position your patient.
• Neuronavigation.
• Electrophysiology whenever available.
• Control your nerves.
Post operative care

Communicate with PICU team.
References

- Tumours In The Region Of Foramen Magnum .Pages With Reference To Book, From 119 To 122 .Naim-ur-rahman ( Department Of Neurosurgery, Rawalpindi Medical College, Rawalpindi. )
- Extensile Exposures To The Craniocervical Junction
- Rhoton, cranial anatomy and surgical approaches,
- Youmans Neurological Surgery ,6th Edition, Ch.308 By Menezes