EVALUATION OF USEFULNESS OF LATERAL RETROPHARYNGEAL APPROACH TO C2, C3 CERVICAL SPINE.

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Abstract:
Surgical approaches to the C23 disc level are challenging because of its location behind the mandible and the vital neurovascular structures overlying the area. Despite the many techniques described in the literature, there is still a lack of consensus concerning the optimum approach to the C23 disc level. The purpose of the prospective study is to evaluate the usefulness of lateral retropharyngeal approach. We have done anterior stabilisation of four cases of c2 pedicle fracture through lateral retropharyngeal approach and there was no complication reported in our study. The purpose of this article is to present the anatomy of the lateral retropharyngeal approach as a guide to increase the safety of the approach to this area. For this purpose, stepwise dissection of this approach and a clinical case illustrating the usefulness of the surgical technique in this region are presented.


Introduction:
There are various approaches described for cervical spine. Indications for upper cervical exposure are many like trauma, tumors and degenerative disease of spine etc. Southwick and Robinson approach is for C3-C7 spine. Shoebinger’s approach needs resection of submandibular gland and extensive dissection. De Andrade approach need anterior dislocation of mandible. Riley’s approaches need deep dissection of neck and extensive exposure. Lateral retropharyngeal exposure has been useful for the simultaneous exposure of the right and left lateral C1 and C2 articulations through a unilateral approach. Whiteside et al described lateral retropharyngeal approach and its usefulness in upper cervical spine injury.
**Method:**

Let's see some important considerations in lateral retropharyngeal approach. Nasotracheal intubation on the side opposite the approach is recommended. The neck is extended and rotated to the opposite side as much as is possible. The ear lobe is sewn anteriorly to the cheek to facilitate exposure of the operative incision. A hockey stick incision is made transversely across the tip of the mastoid process and is carried distally along the anterior border of the sternocleidomastoid muscle (FIG:1).

The greater auricular nerve is identified and dissected in both directions (FIG:2).

The spinal accessory nerve is then identified at its entrance into sternocleidomastoid muscle approximately 3 cm from the mastoid tip (FIG:3).

In case of C1 C2 exposures nerve is retracted anteriorly with the contents of carotid sheath. Contents of carotid sheath and retropharyngeal structures are retracted medially and C1 C2 reached with ease (FIG:4).

The transverse process of C1 C2 are easily palpable. The vertebral artery can be easily avoided by identifying the internal jugular vein and delineating it well. After identifying the transverse processes of C1 C2, fibrous attachments directed anteriorly are divided, which allow access to the retropharyngeal...
space along the anterior the anterior arch of C1 and anterior body of C2. Exposure of the appropriate vertebral bodies is now possible with subperiosteal stripping and, if needed, removal of the anterior cervical muscles that cover the lateral articulations of C1. This approach allows resection of bony lesions involving the lateral mass of C1 C2, the anterior arch of C1, and the body and odontoid process of C2. Bilateral fixation requires a bilateral approach. When we extend the incision down to C5 C6 level, soft tissue dissection and retraction will become very easy for the feasibility of plate fixation. In paediatric cases posterior elements are thin and not able to hold implants. So anterior approach is useful in stabilizing C2 fractures.

28 yr old male, history of RTA – suggestive of whiplash injury, Presented with pain, inability to move his neck. On examination revealed upper cervical tenderness, spasm and flexed attitude of neck. There was no neurological deficit and associated injury of closed fracture shaft of humerus left side (FIG:5).

CT cervical spine revealed C2 over C3 double body sign with bipedicle fracture of C2 (FIG:6, FIG:7).

MRI of the cervical spine revealed C2 C3 traumatic disc bulge (FIG:8). Based on levine and Edwards classification of C2 pedicle fracture, it is classified as type 3 and planned for C2 C3 disectomy, anterior stabilization of C2 C3 with interbody fusion using tricortical bone graft (FIG:9).
Drain removal was done on second postoperative day and Philadelphia collar support was given post operatively. There was no complications postoperatively. Suture removal was done on 14th day.

**Discussion:**
Despite the many techniques described in the literature, there is still a lack of consensus concerning the optimum approach to the C2–3 level. Previously described anterior approaches to C2–3 include the transoral approach with or without mandible and tongue splitting, and tongue splitting provides an excellent exposure of the craniovertebral junction. However, the approach is associated with high rates of surgical morbidity. Moreover, the standard transoral approach exposes the region from the lower one-third of the clivus to the middle of the C-2 vertebral body. Therefore, it is necessary to perform a mandibulotomy to increase the exposed region from the mid-clivus to the C2–3 interspace. Another disadvantage of the transoral approach is oropharynx contamination, when instrumentation is required. The anterolateral extradural approach provides good exposure of the lateral aspect of the upper cervical spine and facilitates decompression of the spinal cord and ipsilateral nerve root. The main disadvantages of the anterolateral approach include dissection of the vertebral artery and potential damage to the spinal accessory nerve. In addition, for optimal exposure and vertebral artery dissection, the C-2 nerve root must be sectioned. The standard Smith-Robinson anterior cervical approach is commonly used for exposure of the anterior surface of the mid and lower cervical spine. It provides an excellent and perpendicular view of the anterior cervical spine from the C-3 level down to the C-7 level. The limitations of the standard Smith-Robinson approach above the level of the C-3 vertebral body are the difficulty in obtaining a perpendicular view of the C2–3 disc at the level of the thecal sac, the need for excessive retraction, and the problems with instrumentation and placing a graft at an oblique, superiorly projecting angle. The main anatomical structure limiting the exposure of the C2–3 disc level through the standard Smith-Robinson approach is the internal branch of the superior laryngeal nerve. Anterior column disruption, Presence of prolapsed disc, Difficulty in C2 instrumentation, Regular southwick Robinson approach not sufficient to fix C2 all these made to choose the safe lateral retropharyngeal approach for this case.

**REFERENCES:**
<table>
<thead>
<tr>
<th>S.NO</th>
<th>NAME</th>
<th>AGE/SEX</th>
<th>DIAGNOSIS</th>
<th>INDICATION FOR ANTERIOR APPROACH</th>
<th>PROCEDURE DONE</th>
<th>COMPLICATIONS</th>
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<tbody>
<tr>
<td>1</td>
<td>Raghvan</td>
<td>29/M</td>
<td>Levine and Edward type III</td>
<td>Anterior column disruption, Presence of prolapsed disc, Difficulty in C2 Instrumentation.</td>
<td>C2 C3 disectomy, anterior stabilization with interbody fusion.</td>
<td>Nil</td>
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<td>2</td>
<td>Veeran</td>
<td>32/M</td>
<td>Levine and Edward type III</td>
<td>Presence of disc fragments</td>
<td>C2 C3 disectomy, anterior stabilization with interbody fusion.</td>
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<td>3</td>
<td>Reja</td>
<td>11/M</td>
<td>Levine and Edward type II A</td>
<td>Peddicutage age, posterior elements are thin.</td>
<td>C2 C3 stabilization.</td>
<td>Nil</td>
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<tr>
<td>4</td>
<td>Suresh</td>
<td>39/M</td>
<td>Levine and Edward type II A</td>
<td>Prolapsed disc, disrupted anterior column with instability</td>
<td>C2 C3 disectomy, anterior stabilization with interbody fusion.</td>
<td>Nil s</td>
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