



Technical Notes

Modified anterior retropharyngeal approach for C2-C3 disc herniation

Keyvan Mostofi¹, Morad Peyravi²

¹Department of Neurosurgery, Centre Clinical de Soyaux, Soyaux, France, ²Department of Neurosurgery, Carl Thiem Klinikum, Cottbus, Germany.

E-mail: *Keyvan Mostofi - keyvan.mostofi@yahoo.fr; Morad Peyravi - moradpeyravi@yahoo.de



*Corresponding author:

Keyvan Mostofi,
Department of Neurosurgery,
Centre Clinical de Soyaux,
Soyaux, France.

keyvan.mostofi@yahoo.fr

Received : 30 October 2022

Accepted : 21 November 2022

Published : 02 December 2022

DOI

10.25259/SNI_996_2022

Quick Response Code:



ABSTRACT

Background: C2-C3 disc herniations are rare, but occur more frequent in the elderly population. As the classical anterior Cloward approach to these lesions is not optimal, we propose an alternative modified retropharyngeal approach to these disc herniations that were successfully utilized in two patients.

Methods: Two patients with C2-C3 disc herniations underwent anterior cervical surgery utilizing the modified retropharyngeal approach.

Results: Surgery was successful in two cases with C2-C3 disc herniation and no patient sustained a perioperative complication.

Conclusion: Our modified anterior retropharyngeal approach for C2-C3 disc herniations resulted in good outcomes without perioperative complications.

Keywords: Cervical disc herniation, Degenerative diseases, Spine surgery, Upper cervical instrumentation, Disc herniation

INTRODUCTION

C2-C3 disc herniation is rare. We were able to identify <50 such cases have in the literature.^[1,2,3,4,5,6,7,8,9] As the classic Cloward approach to this level is suboptimal, we devised our own modified retropharyngeal approach that we successfully utilized in two cases without incurring significant perioperative morbidity.

MATERIALS AND METHODS

Two patients, ages 68 and 59, presented with C2-C3 disc herniations. The first patient had a cervical MRI that showed a left posterolateral C2-C3 disc herniation compressing the C3 nerve root. He underwent a modified retropharyngeal anterior C2-C3 discectomy/fusion using an intersomatic porous alumina ceramic cervical cage with good resolution of his pain a few weeks after surgery. The second patient's cervical MRI demonstrated a posterior/central C2-C3 disc herniation with bilateral foraminal stenosis and cord compression but without a high intramedullary cord signal. He too had a modified retropharyngeal C2-C3 discectomy employing an intersomatic porous alumina ceramic cervical cage, and returned to work 2 months after surgery [Table 1].

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Table 1: Patient characteristics.

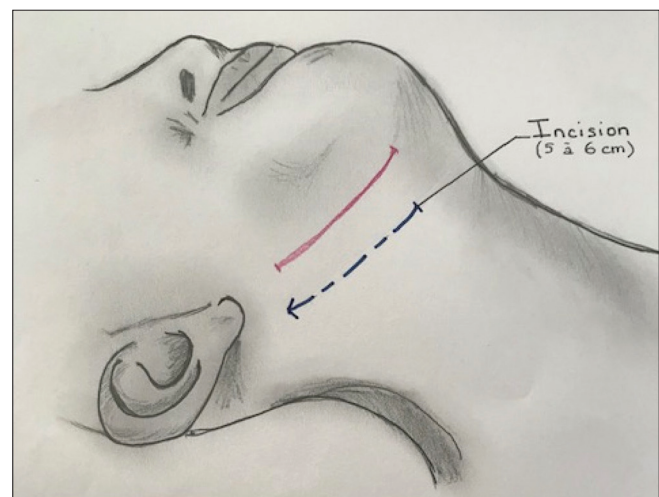
	Patient 1	Patient 2
Age – gender	68 – Male	59 – Male
Medical background	Smoking – blood pressure	Smoking – operated lumbar disc herniation
Occupation	Retired: former postman	Delivery driver
Signs and symptoms	Cervical pain – left occipital head – ache – reduction of cervical range of motion in the left rotation	Arm pain, numbness in four limbs, tiredness in walking, extremities nocturnal tingling, pyramidal syndrome, and distal 4/5 palsy
Imaging data	Left posterolateral C2-C3 disc herniation	Posterior and medial C2-C3 disc herniation-bilateral foraminal stenosis – spinal cord shift
Surgical approach and procedure	Modified retropharyngeal approach anterior C2-C3 discectomy – fusion using cervical cage	Modified retropharyngeal approach – anterior C2-C3 discectomy – fusion using porous alumina ceramic cervical cage.

TECHNICAL NOTE: ANTERIOR-MODIFIED RETROPHARYNGEAL SURGICAL APPROACH TO C2-C3 DISC HERNIATIONS

Patient is in supine position with the neck in extension and head fixed on a Mayfield headrest and rotated 45° to contralateral side. This approach utilized an oblique anterior incision parallel to the mandible [Figures 1 and 2]. (i.e., 5–6 cm in length). A subcutaneous flap is then developed avoiding the marginal branch of the facial nerve. The platysma muscle is then cut with Metzenbaum scissors and the subcutaneous flap and the platysma are folded rostrally and caudally [Figure 3]. Care must be taken not to extend the incision too rostrally to avoid injuring the marginal branch of facial nerve. Next, the submandibular gland must be identified and dissected medially to avoid the facial vein and artery [Figure 4]. The gland is dissected laterally and is lifted and folded up until the facial vein and facial artery are identified. The tendons of the digastric and stylohyoid muscles inserted on the hyoid are next identified and cut [Figure 5]. Here, one must avoid the hypoglossal nerve and the superior thyroid artery both of which are not far away and run under the digastric muscle [Figure 6]. Therefore, cutting the tendon with electrosurgery is inadvisable. In some cases, the superior thyroid artery may be abnormally low; if it obstructs the operating field, it should be cut/ligated.^[2,5,8,9] The longus colli muscles are readily identified, and at this point, the Mayfield head clamp must be used to rotate the head 30° to enable the surgeon to perform the C2-C3 discectomy and place the intersomatic cage. The remainder of the procedure is then performed using the classical Cloward technique [Table 2].

DISCUSSION

The anterior approach to a C2-C3 cervical disc herniation is difficult due to the complex regional anatomy; the presence of mandible, cranial nerves, critical veins, and arteries.^[1-7,9]

**Figure 1:** Cutaneous incision.**Figure 2:** Position and incision.

Multiple approach to the C2-C3 level has previously been suggested; Cloward, Smith-Robinson, transoral anterolateral-extradural, and posterior approaches.^[2,5,7] In our two cases,

Table 2: Classical Cloward technique versus modified retropharyngeal surgical approach.

	Classical cloward technique	Modified retropharyngeal surgical approach
Patients position	The head in the midline – slight extension	The head rotated 45° to contralateral side in incision– then 30° in discectomy
Skin incision	Lateral or horizontal incision	Oblique anterior incision parallel to the mandible
Before discectomy	Platysma separating – identify submandibular gland – dissection starts at the medial part – identify superior thyroid artery	Platysma separating – dissection starts. According to the habits of the neurosurgeon – identify facial vein and artery
Discectomy	Classical procedure	Head rotated 30°-classical procedure

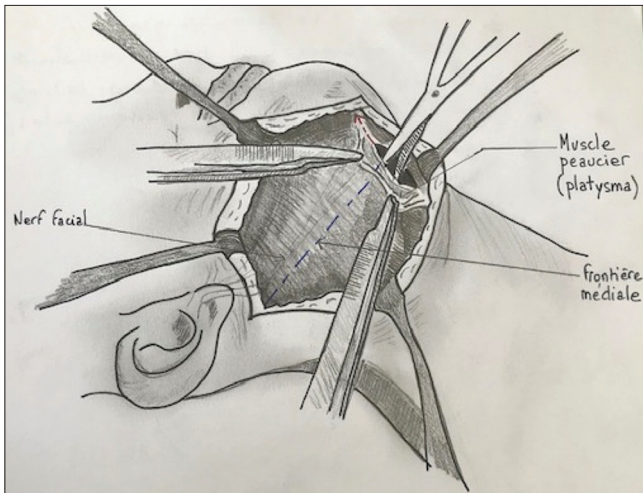


Figure 3: Superficial dissection.

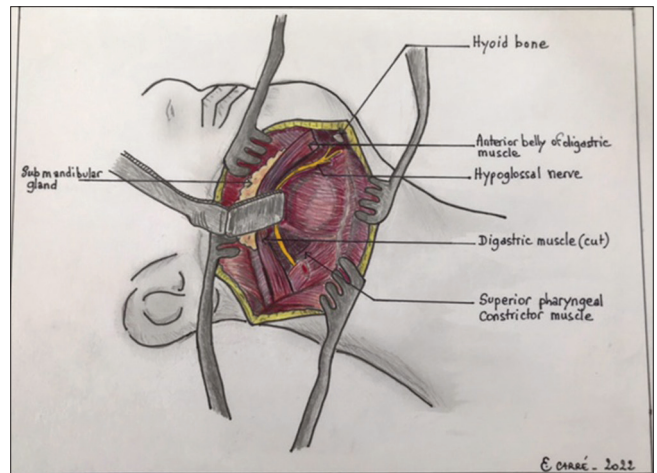


Figure 5: Deep dissection.

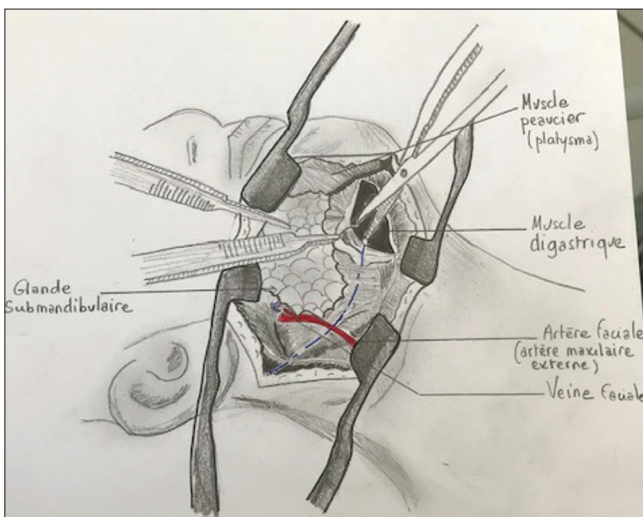


Figure 4: Submandibular dissection.

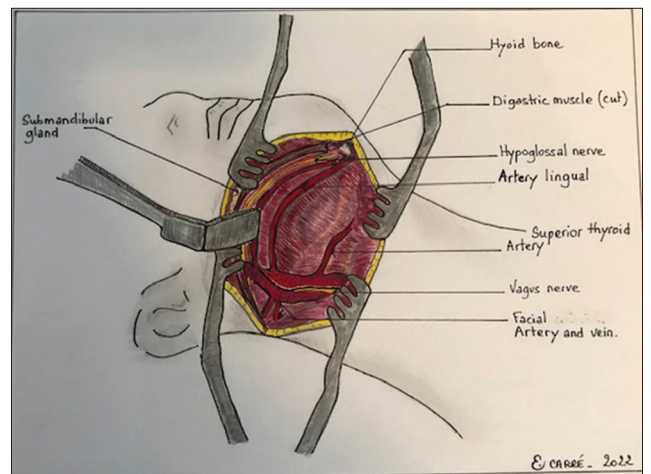


Figure 6: Deep surgical field with vessels.

we used a modified retropharyngeal approach using an oblique incision along the mandible. The allowed for a larger operating cephalad/caudad field. Further, 45° of head rotation facilitated access to multiple anatomical landmarks, the anterior belly of the digastric muscle and permitted better/easier exposure of the hyoid bone, and the anterior

C2-C3 spine thus allowing for completion of the procedure using routine Cloward methodology.

CONCLUSION

Our modified anterior retropharyngeal approach for C2-C3 disc herniation is better tailored to the complex regional

anatomy and would likely lower complication rates associated with anterior C2-C3 disc resections.

Acknowledgment

We would like to thank Mrs. Estelle CARRE for these magnificent drawings which contribute to the better understanding of our paper.

Declaration of patient consent

Patients' consent not required as patients' identities were not disclosed or compromised.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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How to cite this article: Mostofi K, Peyravi M. Modified anterior retropharyngeal approach for C2-C3 disc herniation. *Surg Neurol Int* 2022;13:568.

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