CASE REPORT

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Contralateral Submandibular Retropharyngeal Approach for Recurred High Cervical Chordoma

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The C2 level is the transition zone between the cranial and cervical spine. Because of its high position and anatomic relationship to vital structures, exposing C2 is challenging and the surgical approach is controversial. We report a case of a recurred chordoma in C2 portion, occupying the osseous intraspinal portion. The patient underwent total corpectomy of C3 and gross total removal of tumor by right submandibular approach 3 years previously. We performed a lateral extrapharyngeal approach from contralateral left side with resection C2 central portion followed by gross total removal of mass and placement of graft bone. Although there was transient hypoglossal nerve palsy postoperatively, the patient had full recovery.

KEY WORDS : High cervical chordoma · Retropharyngeal approach.

Introduction

Because the position of C2 varies among patients, the surgical approach to the C2 level is controversial. The approach to C2 must be chosen according to the anatomic position and pathological process in each patient. The variations of the anterior transoral approaches to C2 require either dislocation of the temporomandibular joint, osteotomy of the mandible, or splitting of the tongue[1,3-5,7,10]. The lateral retropharyngeal approaches are more familiar and useful for suitable cases[6,8,11-13]. In this report, we describe the contralateral submandibular approach to C2 level in a recurred chordoma patient with spinal cord compression.

Case Report

A 46-year-old man was admitted to our institute due to history of neck pain, decreased cervical spine rotation, and progressive quadriparesis with particular weakness of the intrinsic muscles of the right upper arm(grade Ⅳ+/Ⅴ). He had received total corpectomy of C3 and gross total removal of chordoma and interbody fusion 3 years ago by right a submandibular approach (Fig. 1).

Magnetic resonance imaging studies 3 years after first surgery showed recurred chordoma and narrowing of the spinal canal at the C2 level (Fig. 2).

Symptoms were secondary to compression of the spinal cord at C2 level. Therefore, he required direct decompression of the neural elements via an appropriate surgical route. Anterior transoral approach was thought to be inappropriate because of the high location of C2 and possibility of adhesion by the previous operation. Due to the history of chordoma operation 3 years ago at the C3 level, adhesion may have formed which led to the contralateral submandibular approach for this operation.

The patient was given nasotracheal anesthesia and was placed on the table in the supine position. The incision started behind the ear over the mastoid process and extends about 1.5㎝ below the angle of the mandible. An inferior extension of the superior limb converted the transverse incision into a T shape. The incision traversed the subcutaneous tissue and platysma. Dissection was then made in a subplatysmal plane. The inferior division of the facial nerve was identified and dissected so as to allow for elevation of the parotid gland and the facial nerve. The jugular digastric nodes in the carotid triangle were removed. The posterior belly of the digastric muscle was traced to its tendon at the hyoid bone and was transected as is the stellar hyoid muscle, to allow for medial retraction of the nasopharynx and laryngopharynx. The hypoglossal nerve swung between the internal and external carotid arteries at the greater

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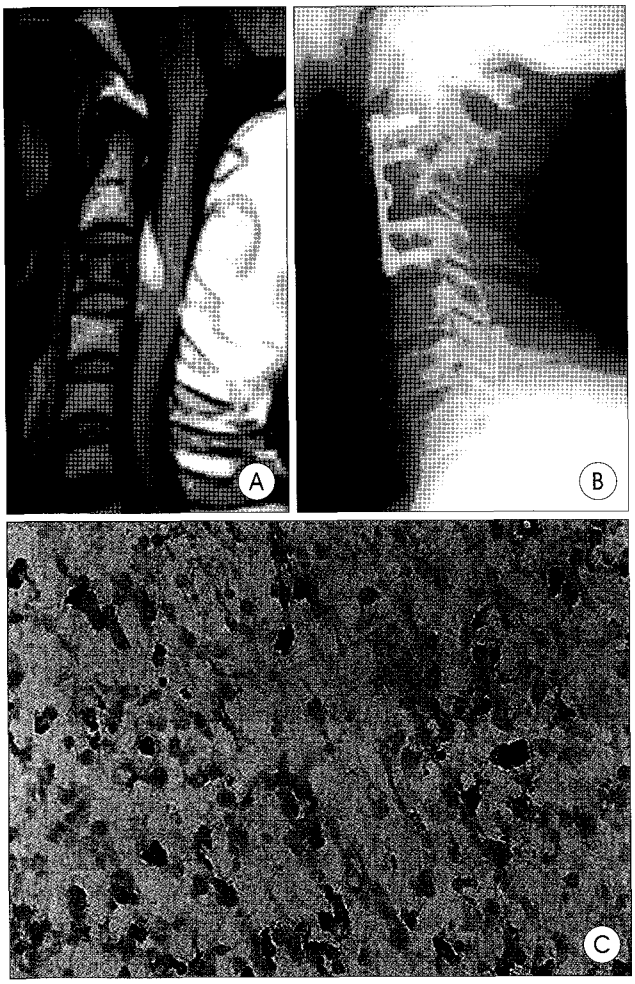

Fig. 1. Preoperative T1-weighted sagittal image after administration of gadolinium demonstrate diffuse enhancing round shaped tumor located at C3 level. B : Postoperative simple radiography shows removal of tumor mass and interbody fusion of C2-4. C : Photomicrographs of tumor specimen shows physaliphorus type of tumor and abundant loose stroma.

conoid of the hyoid bone. Hypoglossal nerve was mobilized superiorly, taking care to preserve the descendens hypoglossi branch. The retropharyngeal space was accessed by means of blunt dissection. Then, we performed the resection of central portion of C2 body, removal of the tumor and placement of graft bone taken from iliac bone and fixation of plate (Fig. 3). After surgery, he showed transient hypoglossal nerve palsy, but recovered fully 4 weeks after the operation without any neurologic deficits. At the follow-up examination 3 months later, the weakness had disappeared and he was able to return to his job.

Discussion

Treatment for lesions of the upper cervical spine should optimally be designed to decompress the neural elements and provide structural support for the head. But the complex anatomy and biomechanical properties of the upper cervical spine make the treatment of instability and neural compression in the region a challenge. Surgical exposure of the C2 has always been considered difficult and dangerous. Because of the anatomic position of C2 and its relationships with significant neighboring structures, some controversy remains about the best approach.

The transoral approach to anteriorly placed lesions at the craniovertebral junction and upper cervical spine has been used for many years[2,5,9,14]. The C2 body, however, is difficult to reach through a simple transoral route, and this approach must be modified in complicated ways to increase surgical exposure and resect the C2 body. The midline mandibular split either with or without a midline glossotomy has been advocated to increase the caudal limit of the exposure[3,5,7,10]. The "mandibular swing" technique can also be used to approach the upper cervical spine and clivus[1], but these techniques are quite invasive. Furthermore, they are hindered by a deep, narrow, and contaminated surgical field. Once the dura is opened, it is difficult to close, and there is a serious risk of infection. And, the need for a tracheostomy increases the rate of complications and infection.

The risks and limitations of the transoral approaches provoked the use of anterolateral approaches to the upper cervical spine through a retropharyngeal route[6,8,11-13,15]. In these techniques, the cervical spine is approached medial to the carotid artery. These techniques provide an exposure similar to that of the transoral routes without the risk of a cerebrospinal fluid fistula and infection. However, the extensive dissection of neurovascular structures and the depth of the exposure are limitations of these approaches, especially in patients with a short, fat neck or a high C2. Complications include paralysis or paresis of the hypoglossal, vagal, and mandibular branches of the facial nerves and the sympathetic chain, injury to the carotid artery, and pharyngeal perforation[11-13]. Retropharyngeal approaches do, however, lower the risk of infection and

Fig. 2. T2-weighted sagittal image shows the recurred chordoma at C2 level.

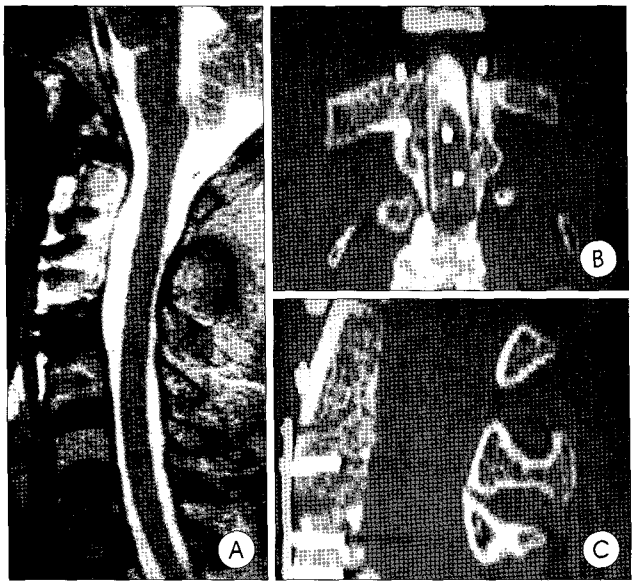

Fig. 3. A : Postoperative magnetic resonace image demonstrate that the spinal cord is decompressed. B, C : Postoperative computed tomography scans show resection of C2 body and placement of graft following tumor mass removal.

better expose the upper cervical spine without the need for extensive transoral approaches[11]. In our case, we can perform the operation without difficulty for adhesion by contralateral submandibular approach for high cervical recurred chordoma. Transient hypoglossal nerve palsy may result from the dissection the surgical plane or resection. So it is important to reduce the injury due to retraction.

Conclusion

The use of the contralateral submandibular approach for the high cervical recurred chordoma is not described in the literature. It can be an effective alternative to anterior transoral approaches.

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