

PRE - SIGMOID SINUS APPROACH TO PETROCLIVAL MENINGIOMA

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Abstract - In this article, the presigmoid avenue to petroclival region is introduced and the advantage of such an approach is discussed. Ten patients were operated on by this approach. Two illustrative cases are also presented.

Acta Medica Iranica 37 (2): 92 - 94; 1999

Key words: Sigmoid sinus, meningioma, skull base, petroclival region

INTRODUCTION

The presigmoid sinus avenue to the petroclival region is especially useful for lesions that are centered in the lateral incisural space and extend infratentorially to the upper and midclivus(1,2). It is also useful in approaching the anterior aspect of the posterior pyramis extending supratentorially to the medial aspect of the middle fossa (3,7).

MATERIALS AND METHODS

The patient was positioned semisitting with the head turned 30° toward the side of the lesion. The usual additional precautions were used (right atrium catheter, appropriate padding of the pressure points). A curvilinear skin incision was made, starting 2 cm above the upper part of the ear and then curved downward in a linear manner to the mastoid process. A temporal and suboccipital craniotomy was performed extending to but not over the transverse sinus which was skeletonized using rongeurs(3). The junction of sigmoid and transverse sinus was exposed together with the medial border of the sigmoid sinus. Using a high speed air drill, an extensive mastoidectomy was done with full length exposure of sigmoid sinus as low as jugular bulb. Drilling

was continued up to the porus acusticus and as far as possible in a posteroanterior direction without entering the posterior semicircular canal or fallopian canal(3). The superior petrosal sinus was transected close to its entrance into the junction of the transverse sinus and sigmoid sinus, after ligatures were applied. The temporal lobe was retracted superiorly and the tentorium cut a few millimeters medial to the superior petrosal sinus toward the petrous apex (3,4). The position of the tumor was then exposed and its relationship to the local neurovascular structures could be assessed. Tumor removal was carried out with the use of standard microsurgical techniques(2,5). The patients harboring petroclival lesions (2,5) that were operated on by using a presigmoid sinus approach were studied.

The patients' age, gender, main signs and symptoms, duration of the latter and localization of the lesions are presented in Table 1.

The mean age of the patients was 54.0 yrs (44 - 69 yrs). Five men, five women were operated upon. Overall 11 procedures were performed.

RESULTS

One total, five subtotal, and four partial resections were performed. The operative complications, morbidity and mortality are as follows: there was one post-operative death due to nosocomial pneumonia and sepsis, two patients developed cerebrospinal fluid (CSF) leak that was managed by spinal drains and conservative measures, one case was complicated by meningitis, that was treated by intravenous antibiotics with no major sequelae. There was one

temporal lobe contusion, two fourth nerve injuries, one third nerve palsy and two cases of reduced hearing pre-operatively (Table 2).

Table 1. Patients summary

No.	Age	sex	symptoms and signs(duration)	Lesion (Imaging)
1	69	F	Headache - 5 years	Left petroclival (MRI)
2	48	M	Altered gait, cerebellar signs (2y)	Right petroclival (MRI + CT)
3	51	M	Reduced hearing, VIII ↓ (1y)	Right petroclival (MRI + CT)
4	50	M	Reduced hearing, VIII ↓ (1y)	Retroclival (MRI)
5	61	F	Double vision VI palsy (5 months)	Left petrous apex (MRI + CT)
6	40	F	Headache, papilledema 3 months	Right petroclival (MRI + CT)
7	58	F	Vertigo, VIII ↓ 1.(5y)	Left petroclival (MRI)
8	44	M	Headache V ↓ (2y)	Bilat petrous + clivus (MRI)
9	63	F	Altered gait, ataxia (3y)	Right petroclival (MRI + CT)
10	56	M	Facial pain, V ↓ (9 months)	Right petroclival (MRI + CT)

A ventriculoperitoneal (VP) shunt was placed for patient 6 with overt hydrocephalus, before performing the main procedure. In three patients (2, 4, 9) combined retrosigmoid, presigmoid approach was performed for better visualization and better resection.

Table 2. Post operative morbidity and mortality (complications)

Death (1):	Nosocomial pneumonia
Meningitis (1):	No major sequela
CSF leak (2):	Conservative management, good recovery
Temporal contusion (1):	Nonoperative management, good result
IV n - palsy (2):	
III n - palsy (1):	Transient
VI n - palsy (1):	Transient at first, remained incompletely
Hearing loss VIII n-injury (4):	Presumably due to excessive drilling or direct cochlear n. injury

Case presentations

Patient 1

A 69 year-old female with a long-standing

headache and generalized seizure was admitted to our hospital. Her general condition was well and there were no major neurologic deficits except for mild cerebellar signs on the left side. Contrast-enhanced brain computerized tomography (CT) and magnetic resonance imaging (MRI) revealed a large petroclival lesion, with petrous ridge and retroclival extension, most compatible with a meningioma.

The patient was operated upon 9 days after admission. A left presigmoid approach was used, and the entire tumor resection was accomplished. The patient was transferred to intensive care unit and remained intubated for two days; left-sided otorrhea subsided with conservative management and a left temporal lobe contusion was evident in the post operative brain CT scan. The patient recovered gradually; right-sided hemiparesis improved to 4⁺/5 force and she was discharged on the 10th post-operative day.

Patients 2

A 50 year-old male was admitted because of reduced hearing and unsteady gait for 1 year. In brain CT and MRI, a retroclival tumor with left petrous ridge extension was noted. Patient was operated upon two weeks later. A combined presigmoid, retrosigmoid approach was performed. Because of the tumor's consistency and hemorrhagic nature, partial resection was accomplished.

Postnasal discharge decreased and eventually stopped spontaneously. The patient was discharged in a good general condition with left-sided hearing loss and left fourth (trochlear) nerve palsy.

DISCUSSION

In comparison to presigmoid sinus approach, other approaches to the petroclival region have limitations regarding the field of view, degree of brain retraction and risk of major complications. In trans-sigmoid approach the main disadvantage

Pre-Sigmoid Sinus approach to...

is the requirement for transection of the sigmoid sinus. But in presigmoid approach, especially when combined with the retrosigmoid one, exposure is similar to the trans-sigmoid and there is a potential hazard in the possibility of iatrogenic hearing loss resulting from extensive pyramidal drilling. In our experience presigmoid approach is a uniquely safe and wide avenue to the petroclival region with an acceptable complication rate and satisfactory operative results.

The advantages of such an approach are the decreased brain retraction required to reach the target areas and a multi-angled approach. In conclusion, the presigmoid sinus approach to petroclival lesions is a safe and multi-angled avenue with acceptable operative results. Iatrogenic hearing loss and other complications of this approach can be reduced by improving surgical techniques.

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