

Cavernous Sinus: endonasal endoscopic approach for pituitary tumors

Seno cavernoso: acceso por vía endoscópica transnasal para tumores de hipófisis

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ABSTRACT

Objective: To show the experience of the Hospital de Puerto Montt on endonasal endoscopic approach (EEA) to the cavernous sinus (CS) **Methods:** A patient series with pituitary tumors who required surgical approach to the cavernous sinus between 2017 and 2018 at the Hospital de Puerto Montt, Chile. **Results:** Thirteen patients, between 30 and 60-year-old, 9 women and 4 men. All the cases presented pituitary tumors, four were functioning adenomas. Imagenological evaluation was made using the Knosp scale. In all cases the chosen approach was transpterygoid. There were no vascular complications, neither cranial nerves nor cerebrospinal fluid leaks. Resection was complete in 6/13 patients and clinical remission in 3 of 5 functioning cases. **Discussion:** Tumor extension to the cavernous sinus is a situation that usually limits the intent of resection of a pituitary tumor, and also orient complimentary treatment. Knowledge of the anatomy of the sellar and cavernous regions allow surgical approaches with less complications and higher grade of resection. **Conclusion:** The endonasal endoscopic approach to the cavernous sinus is possible in some patients. Staging of the disease, resectability and indication of complementary therapies must be performed after careful multidisciplinary evaluation.

Keywords: Endonasal; Endoscopic; Cavernous sinus; Pituitary

RESUMEN

Objetivo: Mostrar la experiencia del Hospital de Puerto Montt en acceso al seno cavernoso por vía endonasal endoscópica. **Metodología:** Se presentan una serie de pacientes con patologías que requirieron accesos quirúrgicos al seno cavernoso. **Resultados:** Son 13 pacientes, entre 30 y 60 años, 9 mujeres y 4 varones. La patología fue tumores de hipófisis en todos los casos, 4 de ellos fueron funcionantes. Se hizo evaluación imagenológica según escala de Knosp. El acceso fue transpterigoideo en todos los casos. No hubo complicaciones vasculares mayores ni de pares craneanos. Se documenta el grado de resección quirúrgica por hallazgos intraoperatorios y por RNM post operatoria. **Discusión:** El compromiso tumoral del seno cavernoso es un hecho que marca muchas veces el intento de resección de una lesión selar, además de orientar el uso de terapias complementarias, tanto farmacológicas como radioterapia. La descripción de la anatomía específica de la región selar y del seno cavernoso han permitido el acceso quirúrgico con una disminución en las complicaciones y mayores grados de resección en esta serie de pacientes. **Conclusión:** En algunos pacientes es posible el acceso y la resección tumoral en el seno cavernoso. La etapificación de la enfermedad, respecto a la irreseabilidad e indicación de terapias complementarias.

Palabras clave: Endonasal; Endoscópico; Seno Cavernoso, Hipofise

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INTRODUCTION

Cavernous sinus (CS) tumors are originated from diverse etiologies, mainly pituitary tumors, meningiomas and aneurysms, and pituitary disease has the major incidence in comparison to the others. On the other hand, anatomical and clinical reports have described the microanatomy of the cavernous sinus, chiasm and stalk vasculature. The endonasal endoscopic approach (EEA) has contributed to an innovative view of the parasellar pathology, being this approach the first choice for many surgeons. Many reports comment on the EEA for the CS in both functioning and non-functioning pituitary tumors. This approach provides longer periods of remission in non-functioning tumors, delaying the indication of radiotherapy. Regarding functioning tumors, a proportion of them with partial invasion of the CS are susceptible to complete remission.

MATERIALS AND METHODS

The analysis of a clinical series of patients with pituitary tumors with extension to the CS was performed in the Puerto Montt Hospital, Los Lagos Region, at the south of Chile, from 2017 to 2018.

Preoperative evaluation was performed by local “sellar team”, composed by specialists in endocrinology, neuroradiology, otorhinolaryngology, and neurosurgery.

The approach for all the patients was a binostril EEA, using 0°, 30° and 45° optic endoscopes and surgical instruments by Storz®. Head was rotated to the right and fixed by a Mayfield head clamp. Medtronic navigation and Koven HD 307 doppler system were also used.

The postoperative period was done in the intermediate care unit of the Hospital de Puerto Montt by the endocrinological team. All laboratory test and imaging (magnetic resonance, Phillips Intera, 1,5 T) were made in the same institution, Follow up was carried out in the outpatient clinic of our

institution.

We operated on a total of 13 patients, between 30 y 60-year-old. There were 9 women and 4 men. All patients had pituitary tumors, 5 of them were functioning – 4 with acromegaly and 1 with Cushing’s disease. Imagenological evaluation was made using the Knosp (K) scale. There were no patients with grade 0 and 1. One patient had a K2, 6 patients had a 3A, one had a 3B and five had K4 tumors. The approach was transpterygoid in all cases. Complete total resection was achieved in the patient with K2 and in 5/6 patients with K3A tumors. The patient with K3B and all the patients with K4 lesions were only partially resected.

Regarding the functionality of the tumors, the only ACTH-secreting tumor was a K2 lesion that was completely resected and achieved hormonal remission. The other four functioning tumors were GH-secreting. Three of them were K3A, which were completely resected, and the other 2 cases (one K3B and in K4) were only partially resected.

There were no vascular, or cranial nerve complications, nor cerebrospinal fluid leaks.

Table. Functionality of the tumors.

Knosp	Number	Complete Resection	Non-functioning	Functioning
0	0	0	0	0
1	0	0	0	0
2	1	1	1	0
3A	6	5	3	3
3B	1	0	0	1
4	5	0	4	1
Total	13	6	8	5

DISCUSSION

Pituitary pathology has a frequency that allows multimodal therapeutic strategies according to the clinical presentation. Natural history of this disease, the clinical state of the patient, the skills of the surgical team, advantages, effectivity and risks of the surgery and medical treatments should be considered. The evaluation of each individual patient must be done using these considerations.

Therapeutic algorithms must be periodically evaluated in light of new technologies and knowledge. Also, these algorithms should be simple, but if they are so simple, they have the risk to exclude a proportion of cases that leave the rule.

This is the case of pituitary tumors with CS Invasion, either functioning as non-functioning. The neat evaluation could optimize the treatment in these patients in a skilled surgical team.

The endonasal endoscopic approach to the cavernous sinus is possible in some patients. Staging of the disease, resectability and indication of complementary therapies must be performed after careful multidisciplinary evaluation.

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