



ORIGINAL ARTICLE

## Endoscopic Surgery in the Skull Base Unit: Experience in the First 72 Cases<sup>☆</sup>

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### KEYWORDS

Multidisciplinary team;  
Skull base;  
Endoscopic surgery;  
Pituitary adenoma;  
Cerebrospinal fluid leak

### Abstract

**Introduction:** A multidisciplinary team is essential to develop and expand the indications in endonasal endoscopic skull base surgery.

The aim of this study was to present our experience in a group of patients with skull base lesions treated using endonasal endoscopic approach.

**Methods:** From January 2008 to January 2012, 72 patients with skull base involvement were diagnosed and treated in our centre.

**Results:** The mean patient age was 53 years. The different pathologies included 36 pituitary adenomas, 10 cerebrospinal fluid leaks and 5 inverted papillomas as the most frequent pathologies. We performed a transsphenoidal transellar approach in 45 cases, a transmaxillary transpterygoid approach in 4 cases and a transnasal expanded approach in 6 cases. We performed an ethmoidal/sphenoidal approach in 12 patients and a Draf IIb/III procedure in four cases. Total resection was achieved in 61% of patients with pituitary adenomas, subtotal in 22% and partial in 17%. Successful repair was achieved in 86% of CSF leaks. No recurrences were observed in patients with inverted papilloma. Complications were observed in 21 patients (29%), 6 being major complications.

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**PALABRAS CLAVE**

Equipo multidisciplinar;  
Base de cráneo;  
Cirugía endoscópica;  
Adenomas hipófisis;  
Fístulas líquido cefalorraquídeo

*Conclusions:* Our centre stresses the importance of multidisciplinary collaboration in endoscopic endonasal skull base surgery.

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## Integración de la cirugía endoscópica en una unidad de base de cráneo: experiencia en los primeros 72 casos

### Resumen

*Introducción:* La formación de un equipo multidisciplinar es imprescindible para desarrollar y ampliar las indicaciones en la cirugía endonasal endoscópica de la base de cráneo.

El objetivo de este trabajo es presentar nuestra experiencia en el grupo de pacientes con afectación de la base de cráneo intervenidos con un abordaje endonasal endoscópico.

*Métodos:* De enero de 2008 a enero de 2012, 72 pacientes con afectación de la base de cráneo fueron diagnosticados y tratados en nuestro centro.

*Resultados:* La edad media de los pacientes en el momento del diagnóstico fue de 53 años. Las diferentes patologías incluyeron 36 adenomas de hipófisis, 10 fístulas de líquido cefalorraquídeo y 5 papilomas invertidos como las más frecuentes. En 45 casos se llevó a cabo un abordaje transesfenoidal transellar, en 4 casos un abordaje transmaxilar transpterigoideo y en 6 casos un abordaje transnasal ampliado. En 12 pacientes se realizó un abordaje a través del etmoides y/o del seno esfenoidal y en 4 casos se utilizó un abordaje frontal tipo Draef IIb/III. En el 61% de los adenomas se consiguió una resección total, en el 22% subtotal y en el 17% parcial. El 86% de las fístulas de líquido cefalorraquídeo se repararon con éxito. No se evidenció ninguna recidiva en los papilomas invertidos intervenidos. En 21 pacientes (29%) ocurrió algún tipo de complicación, apareciendo 6 complicaciones de orden mayor.

*Conclusiones:* Nuestro centro apuesta por la colaboración multidisciplinar en la cirugía endoscópica de la base de cráneo como línea de excelencia.

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## Introduction

The endonasal approach to the skull base has undergone rapid development in recent years, helped by a better understanding of the anatomy of this region, the development of new surgical techniques and reconstruction materials, improvements in imaging studies and navigation systems, and also through interdisciplinary collaboration between different specialties. Thus, the endoscopic endonasal technique used by otolaryngologists in infectious and inflammatory pathologies of the paranasal sinuses began to expand its indications, reaching territories previously treated by other specialties within a few years. However, the main limitation to the progression of this approach was the difficulty in achieving a bimanual dissection, an option so far only offered by the microscope. In 1990, May was the first to describe the endoscopic technique with "4 hands", allowing 2 surgeons to work in the same surgical field and facilitating treatment of territories which previously seemed inaccessible.<sup>1</sup> Various new pathologies, such as cerebrospinal fluid (CSF) fistulas (or leaks), began to be treated, and it became possible to approach the orbit, the pituitary gland, the anterior skull base, the pterygopalatine fossa and the infratemporal fossa.<sup>2-4</sup>

Currently, most pathologies located in the skull base are jointly treated by an otolaryngologist and a neurosurgeon using this endoscopic endonasal "4 hands" technique.

The aim of our study is to present our experience analysing the main epidemiological and surgical results of the group of patients with involvement of the skull base, intervened using an endoscopic endonasal approach (EEA).

## Methods

The data for the present study were obtained from information contained in the database of our centre, which prospectively collected epidemiological and therapeutic results of skull base pathologies treated exclusively through EEA.

The therapeutic strategy to be followed for each pathology was decided by the Skull Base Committee, which was redefined in 2008, and is comprised by representatives of the Neurosurgery, ENT, Endocrinology, Radiology and Anaesthesiology Services, with occasional advice from an ophthalmologist and/or a pathologist.

A total of 72 lesions with involvement of the skull base were diagnosed between January 2008 and January 2012. Of these, 22% (16/72) were revision surgeries.

All tumours were studied pre- and postoperatively using computed tomography (CT) and magnetic resonance imaging (MRI) scans.

Adenomas were classified into microadenomas and macroadenomas, according to whether tumour diameter was less than or greater than 1 cm, respectively. Invasion of the cavernous sinus was classified according to the lateral extension relative to the internal carotid artery, following the classification proposed by Knosp et al.<sup>5</sup> Grades 3 and 4 were considered as invasion of the cavernous sinus. The remaining cases (grades 0, 1 and 2) were considered as compression without invasion. A hormonal study was conducted for all pituitary lesions in order to rule out hypersecretion and hypofunction. In addition, an examination of the visual field was carried out if the lesion contacted or

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