

## Introduction

Extended endonasal approaches to the skull base are emerging as minimal invasive techniques for the treatment of skull base lesions. We report our clinical experience with the endoscopic transcribriform approach for the resection of anterior skull base lesions.

## Material and Methods

Between august 2011 and january 2013, 4 patients underwent an endoscopic transcribriform approach for an invasive skull base lesion: 2 ethmoid carcinomas with intracranial extension, 1 invasive aspergillosis and 1 olfactory meningioma. All procedures were performed by an ENT surgeon and a neurosurgeon together with a 2 nostrils – 4 hands collaboration. Electromagnetic neuronavigation (Medtronic Treon) was used in all cases. For endoscopic resection in the anterior skull base a 30° endoscope is used.

## Results

In 3 of the 4 patients the immediate postoperative course was uneventfull. 1 patient with previous posterior fossa surgery, developed hydrocephalus and was treated with vp-shunting using a programmable valve (Codman Medos). None of the 4 patients developed postoperative CSF leak or meningitis. In 3 of the 4 cases only fascia lata was used for closure of the skull and dura defect, in 1 patient fascia lata and bilateral nasoseptal flap were used. No hard materials as metal mesh or bone graft were used. In none of the patients postoperative frontal sagging was noticed. All patients are alive and free of local recurrence, 2 developed progression at distance of the initial surgery site.

## Conclusion

**Endoscopic transnasal transcribriform approach is a safe and feasible technique for the resection of lesions of the anterior skull base. Collaboration of skilled ENT-surgeon and neurosurgeon is mandatory. This approach is advocated in cases where the pathology originates in the the nasal cavity and invades the skull base. As experience grows, also pure intracranial anterior skull base lesions could be treated. Indications are olfactory groove meningioma, esthesioneuroblastoma, chondrosarcoma.**

### References

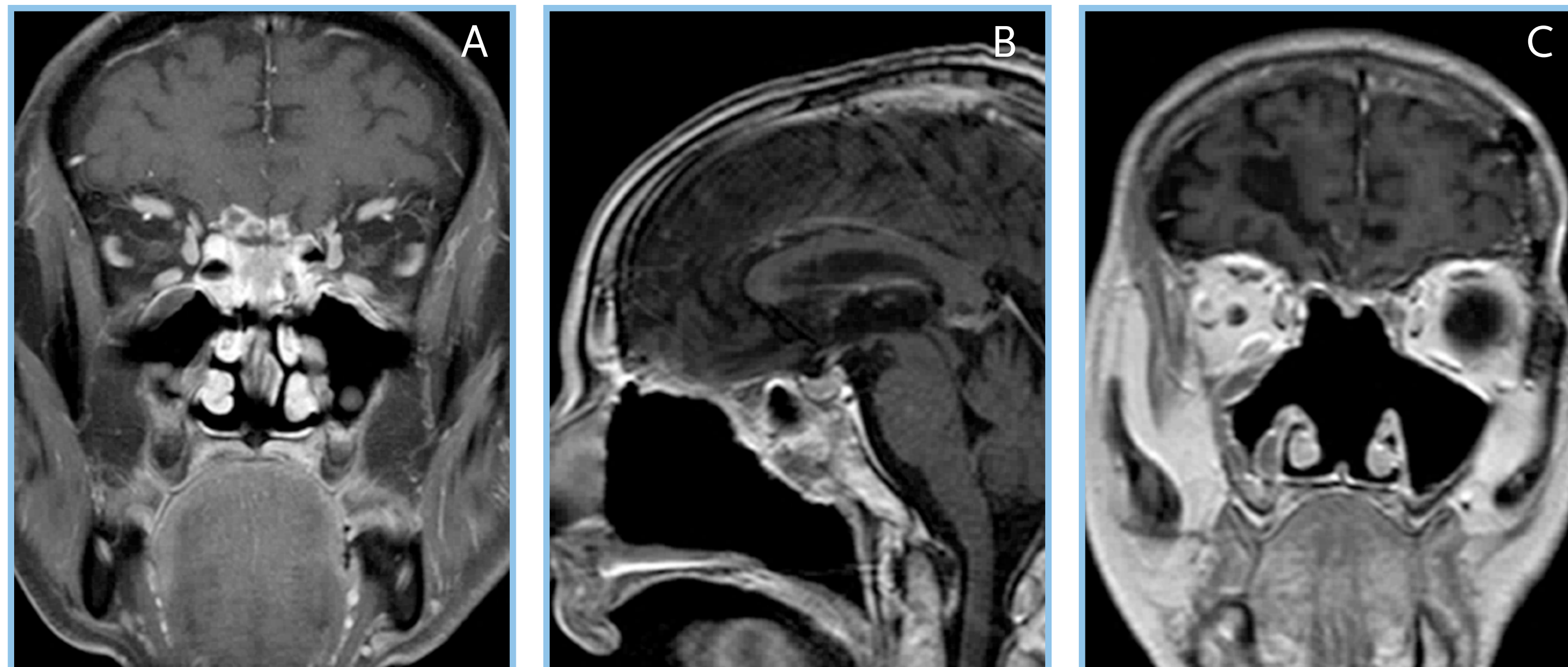
1. Kassam A, Snyderman CH, Mintz A, Gardner P, Carrau RL: Expanded endonasal approach: the rostrocaudal axis. Part I. Crista galli to the sella turcica. Neurosurg Focus. 2005 Jul 15;19(1):E3.
2. Kassam A, Snyderman CH, Mintz A, Gardner P, Carrau RL: Expanded endonasal approach: the rostrocaudal axis. Part II. Posterior clinoids to the foramen magnum. Neurosurg Focus. 2005 Jul 15;19(1):E4.
3. Kassam AB, Gardner P, Snyderman C, Mintz A, Carrau R: Expanded endonasal approach: fully endoscopic, completely transnasal approach to the middle third of the clivus, petrous bone, middle cranial fossa, and infratemporal fossa. Neurosurg Focus. 2005 Jul 15;19(1):E6.
4. Kassam A, Snyderman CH, Carrau RL, Gardner P, Mintz A: Endoneurosurgical hemostasis techniques: lessons learned from 400 cases. Neurosurg Focus. 2005 Jul 15;19(1):E7.
5. Gardner PA, Prevedello DM, Kassam AB, Snyderman CH, Carrau RL, Mintz AH. The evolution of the endonasal approach for craniopharyngiomas. J Neurosurg. 2008 May;108(5):1043-7.
6. Zanation AM, Carrau RL, Snyderman CH, Germanwala AV, Gardner PA, Prevedello DM, Kassam AB. Nasoseptal flap reconstruction of high flow intraoperative cerebral spinal fluid leaks during endoscopic skull base surgery. Am J Rhinol Allergy. 2009 Sep-Oct;23(5):518-21.

## Patients

### Patient 1: DW

Pathology	Aspergillosis
Follow up	13 m
Local recurrence	No
Reconstruction	Fascia lata
Recurrence at distance	5 m: sinus cavernous R/resection

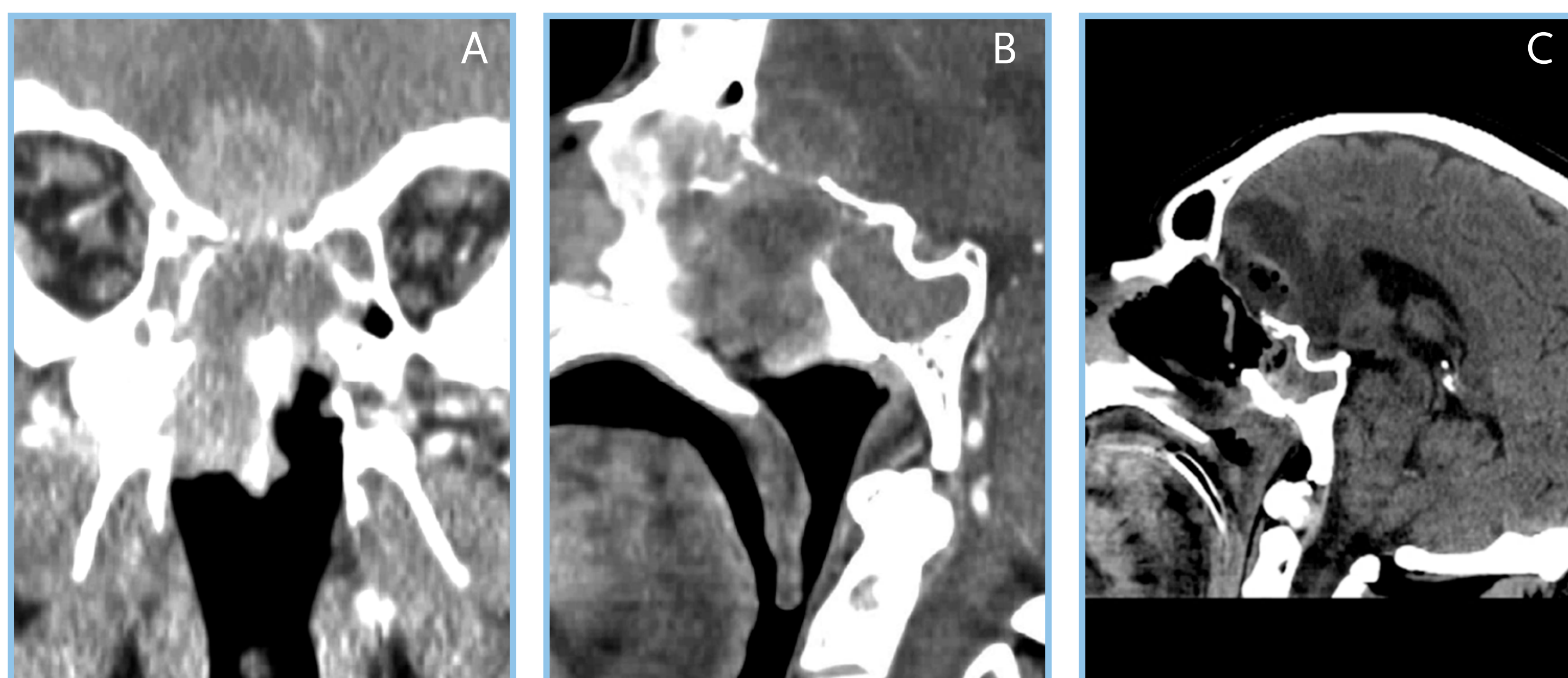
*Invasive aspergillosis of nasal septum and skull base with intracranial abces. A) pre-operative coronal MRI scan. B and C) post-operative sagittal and coronal MRI*



### Patient 2: VJ

Pathology	Ethmoid carcinoma
Relevant history	Cardiac pacemaker
Follow up	18 m
Local recurrence	No
Reconstruction	Fascia lata
Recurrence at distance	8 m: sphenoid wing R/ resection

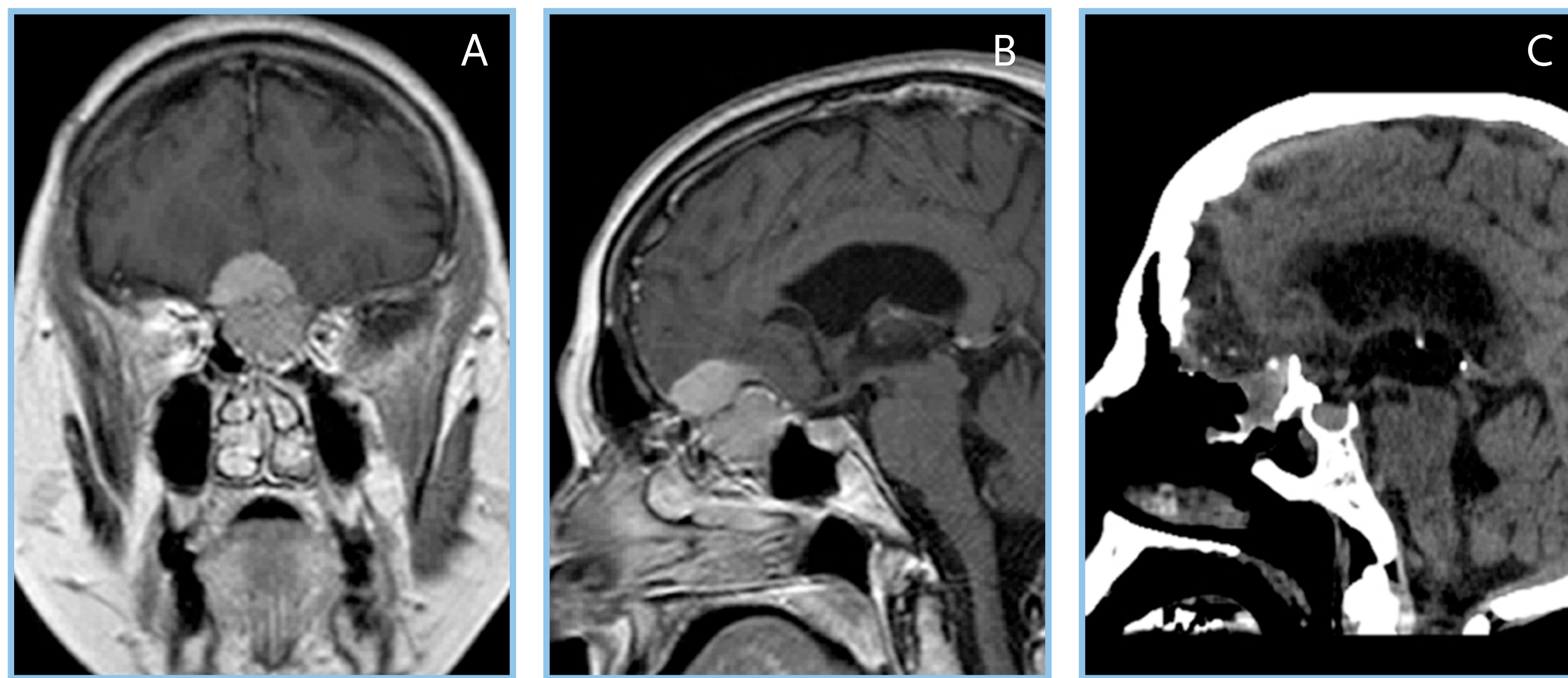
*Invasive adenocarcinoma with intracranial component. A and B) preoperative coronal and sagittal CT scan. C) postoperative CT scan*



### Patient 3: LB

Pathology	Meningioma
Relevant history	Resection clival meningioma
Follow up	12 m
Local recurrence	No
Reconstruction	Fascia lata + nasoseptal flap

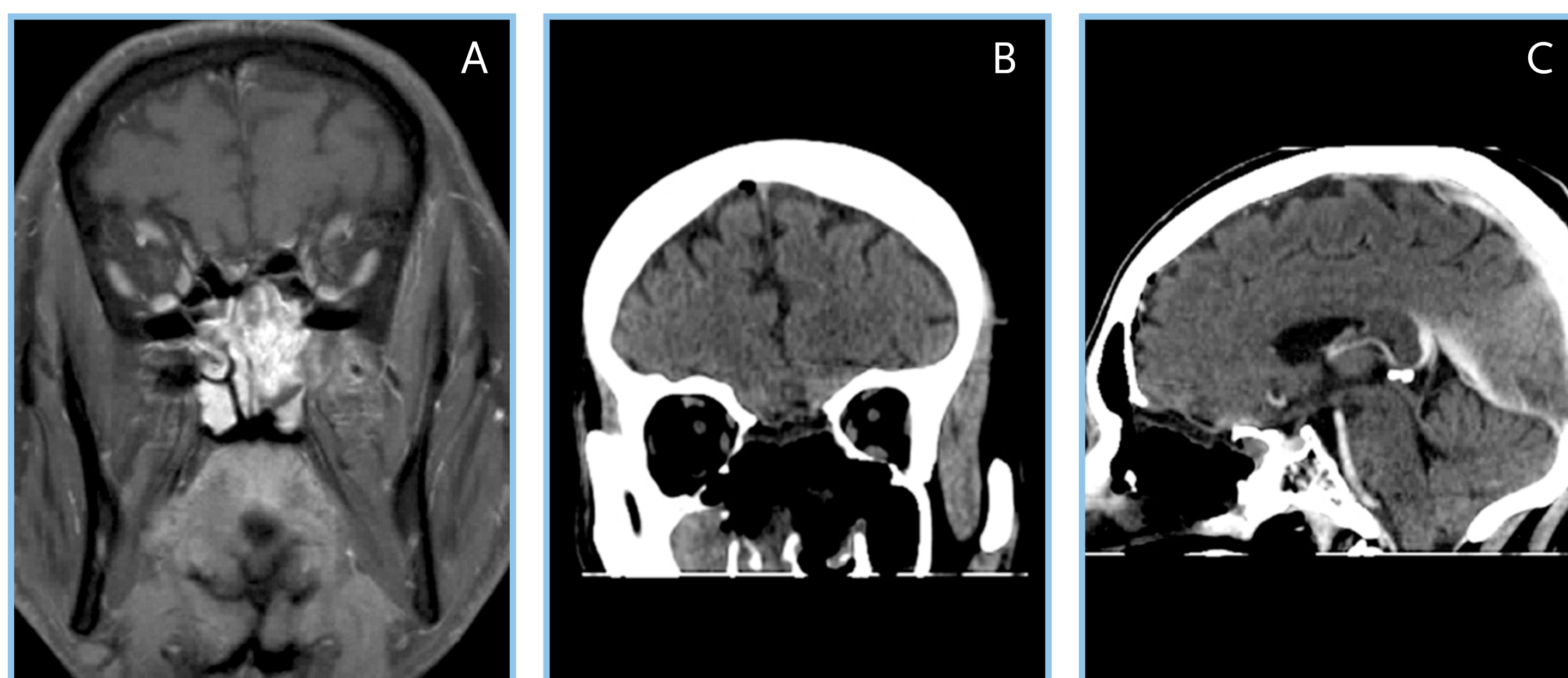
*Olfactory groove meningioma with endonasal component. A and B) preoperative coronal and sagittal MRI. C) postoperative sagittal CT scan*



### Patient 4: BG

Pathology	Ethmoid carcinoma
Follow up	3 m
Local recurrence	No
Reconstruction	Fascia lata

*Adenocarcinoma invading frontal skull base. A) Preoperative coronal MRI B and C) postoperative coronal and sagittal CT scan*

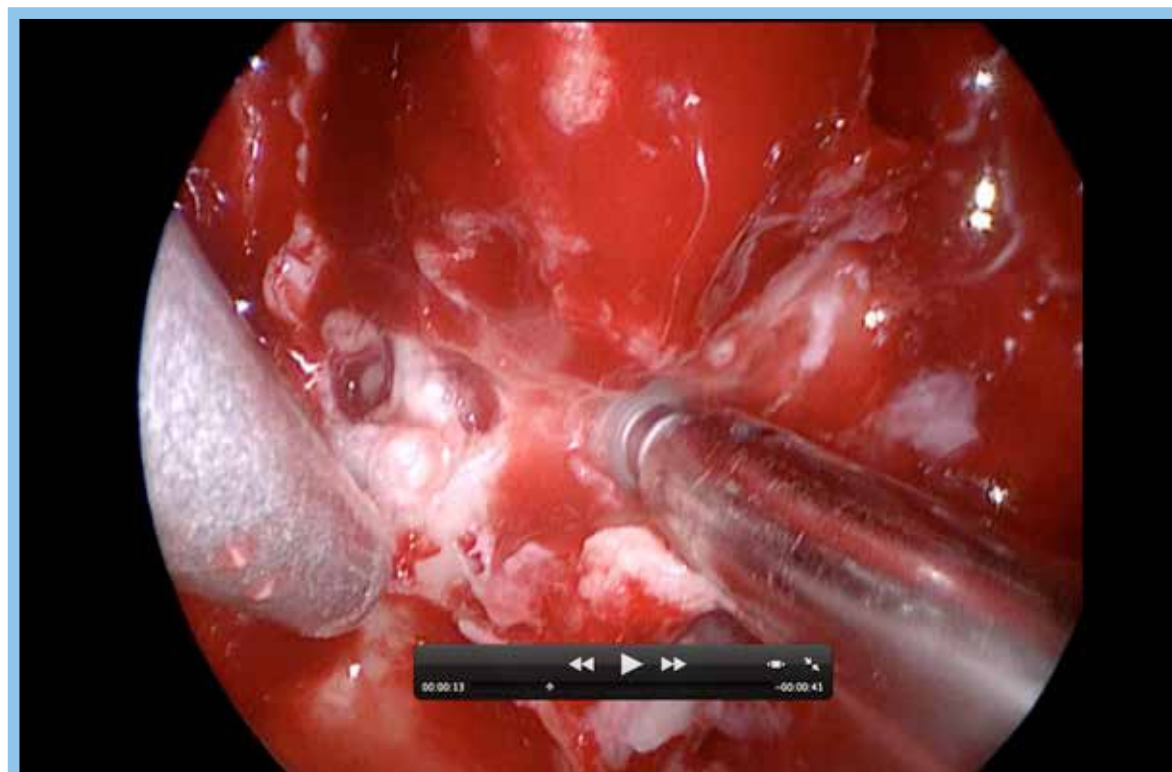


## Surgical technique

### 1. Drilling lamina cribrosa

Scan QR-code and view video on your mobile.

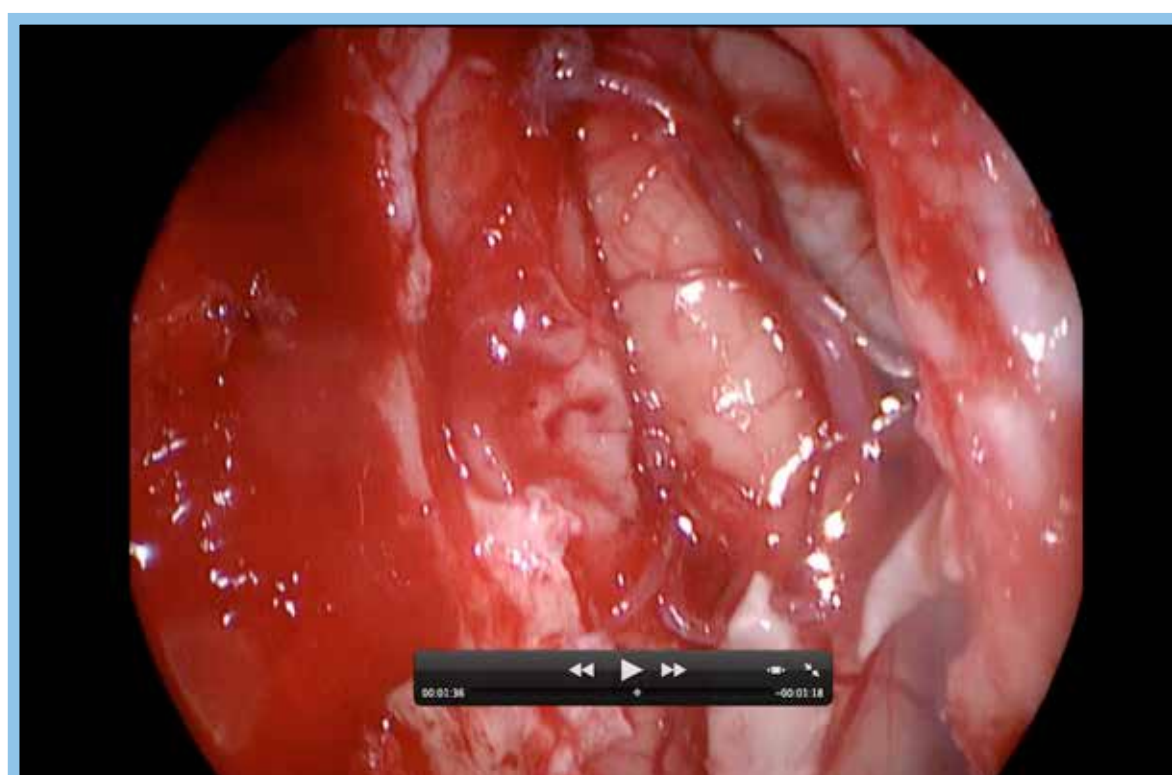
Download the QR-code reader on your mobile phone for free.



### 2. Removing tumor invading lamina cribrosa and amputation of olfactory nerves

Scan QR-code and view video on your mobile.

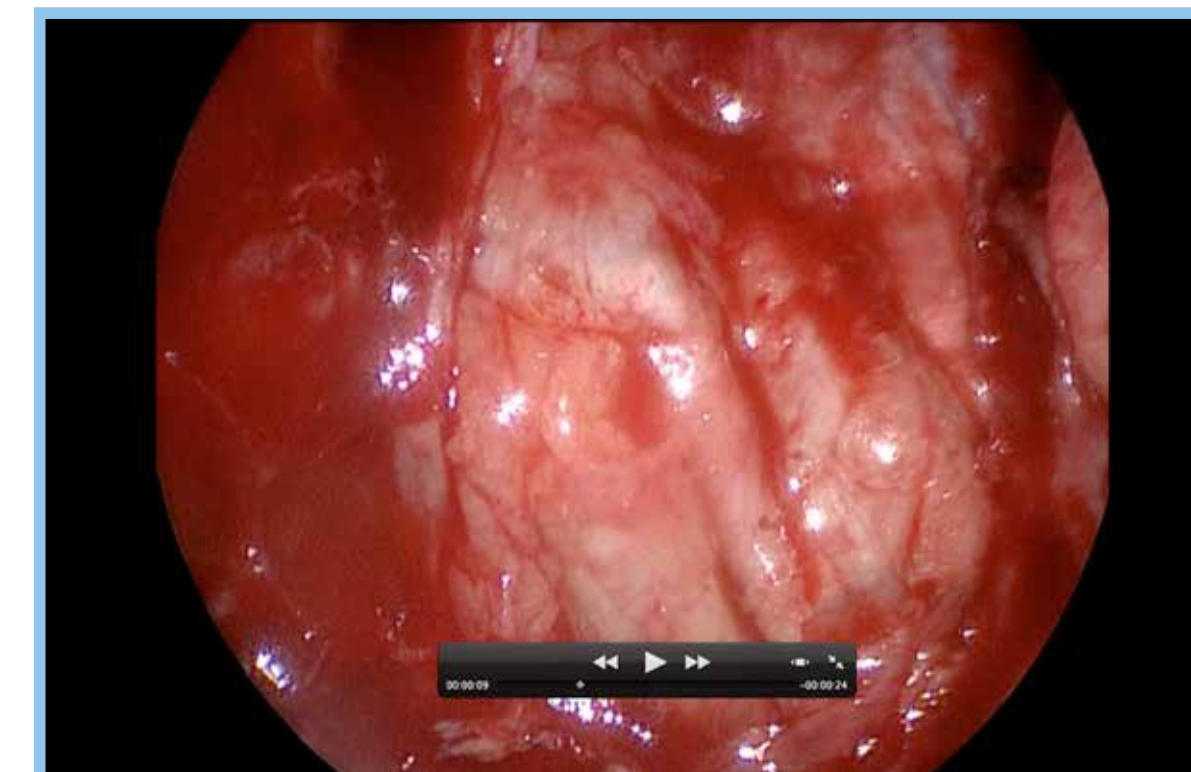
Download the QR-code reader on your mobile phone for free.



### 3. Closure of the defect: first intracranial layer of fascia lata

Scan QR-code and view video on your mobile.

Download the QR-code reader on your mobile phone for free.



### 4. Closure of the defect: second extracranial layer of fascia lata after application of Duraseal

Scan QR-code and view video on your mobile.

Download the QR-code reader on your mobile phone for free.

