Onodi Cell Dehiscence: A rare cause of Ophthalmic artery injury in Endonasal Surgery

Rajesh Chhabra Mch, Apinderpreet Singh Mch
Department of Neurosurgery , PGIMER
Chandigarh, India

Abstract

Onodi cell is usually defined as posterior most ethmoidal cell extending posterolateral to sphenoid sinus. Optic nerve and sometimes Carotid Artery may lie dehiscent in it. Care should be taken intraoperatively in lesions around such areas.
While performing trans-sphenoidal surgery for Pituitary Macro adenoma with an onodi cell, there was an arterial sputter from the right Lateral Optico-carotid recess during ablation of thickened mucosa from sphenoid sinus in that region. It was controlled with gentle compression with liquid gel foam and surgical augmentation. The tumour was removed successfully. Post-operative scan showed an ophthalmic artery aneurysm which was managed with coil and blockage of the artery while the distal ophthalmic segment took supply from ECA collaterals. Post-operative vision and clinical status was normal.

Introduction

Onodi cell is a normal variant – also called sphenoethmoidal air cell.

Optic nerve and sometimes ICA is dehiscent

Should be careful while operating around this region

The dehiscent nerve and vessel can be missed particularly if sphenoid mucosa is thick

In trans-sphenoidal surgery, if missed, can be sometimes disastrous particularly while removing mucosa and drilling the bone around

Coblation though safe, but can cause thermal damage to vessel if exposed directly

Methods and Materials

A 37 year male presented with painless progressive vison loss and bitemporal field defect

MRI suggested Pituitary Macro adenoma of KNOSP 3 and Hardy grade B while MR angiography was normal(Fig 1)

CT PNS suggested bilateral Onodi cell with pneumatisation extending up to Anterior Clinoid process (Fig 2)

Endoscopic Trans-sphenoidal surgery was performed – Binostril approach and sphenoid sinus was exposed. The thickened sphenoid mucosa was removed and ablated with Coblator

Image 1

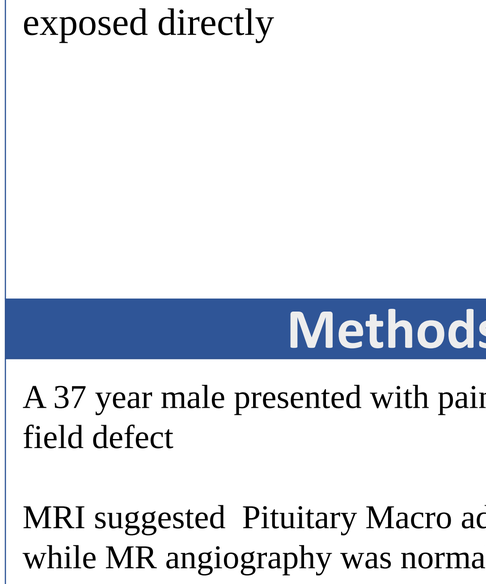
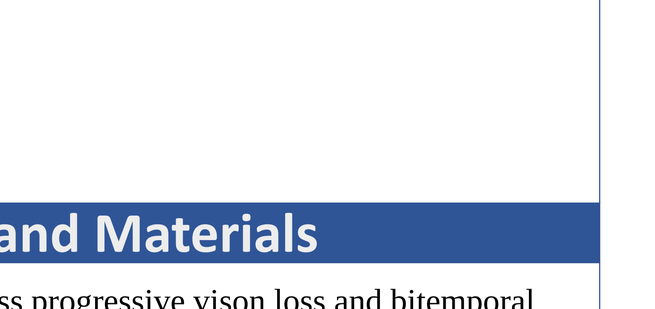


Image 2



Results

While ablating the mucosa from left LOCR –there was an arterial sputter. The bleed was controlled by liquefied gel foam and surgical augmentation Fig 3

The tumour was removed successfully (Fig 3)

Post-operative scan showed gross total resection without evidence of bleed Fig.4

DSA demonstrated an ophthalmic artery aneurysm on right side Fig.4

Coil blockage of vessel was performed . The distal OPA took its supply from ECA perforators preserving patient's vision (Fig 5)

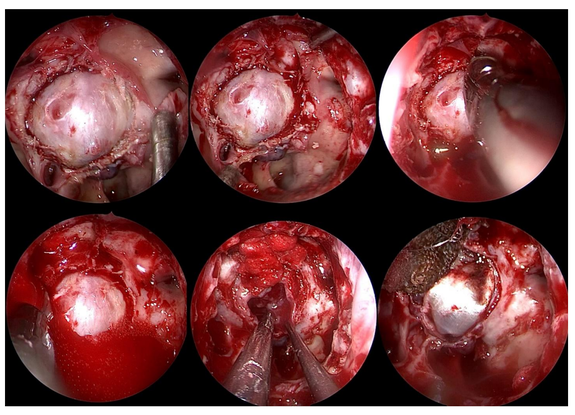


Fig 3 – Intraoperative images demonstrating B/L LOCR. Arterial bleeding while ablating mucosa with Coblator, controlled and tumour removal later on

Fig 4. Post-operative CT showing complete resection while angiography demonstrating ophthalmic artery aneurysm at the level of right onodi cell

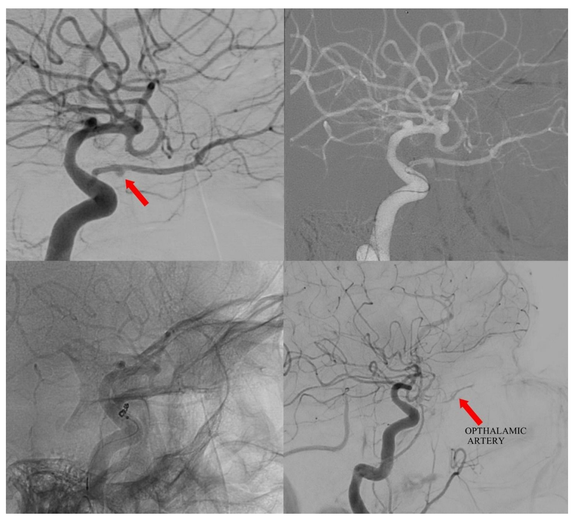


Fig 5. Demonstrated DSA images of Right Ophthalmic artery aneurysm . Coil blockage of the artery contemplated. The distal part of artery filling from ECA collaterals.

Discussion

Onodi cell presence is not uncommon

For all cases undergoing surgery around sphenoid sinus, pre-operative radiology should be carefully studied

In case of mucosal thickness , it should be carefully dissected

Keep an high index of suspicion for Pseudoaneurysm even if the bleed stops

Conclusions

Presence of onodi cell is an indication that optic nerve or ICA can be dehiscent

While operating around onodi cell region, do not use instrumentation, drilling or coagulation blindly

Do not attempt to coagulate or press too hard on the arterial bleeder and try to control it with gentle compression

Get immediate post-operative DSA and repeat if first DSA is negative after few days and at a later date to look for late onset Pseudoaneurysm formation

Contact

[name] Rajesh Chhabra
[organization]- PGIMER Chandigarh
[address] India
[email] drrajeshchhabra@gmail.com
[phone] - +91 9815091234

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