

# THE ANTERIOR OLFACTORY CLEFT: AN AREA OF WEAKNESS CAUSED BY THE ETHMOIDAL FISSURE.

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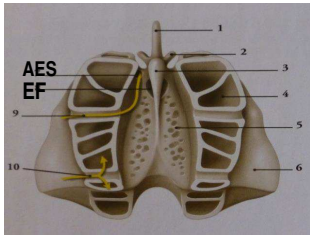
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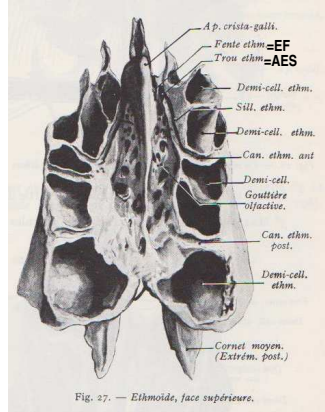
## ONE HUNDRED YEARS AGO.....

### ROUVIERE (1911) AND GRAY (1913) DESCRIBED THE ETHMOIDAL FISSURE (EF)

- A foramen of the anterior AND MEDIAL part of the CRIBRIFORM PLATE (CP)
- Close from the CRISTA GALLI (CG)
- Containing a PROCESS OF DURA MATER



Schematic superior view of CP



Original superior view of CP according to ROUVIERE

### ...UNTIL NOW, AUTHORS DESCRIBE ONLY ANOTHER FORAMEN...

#### ...CALLED THE ANTERIOR ETHMOIDAL SLIT (AES)

- A small foramen of the anterior part AND LATERAL part of the CP
- Containing a branch of V2 and of the Anterior Ethmoidal Artery (AEA)

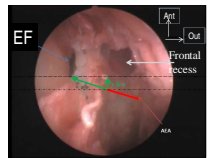
## MATERIAL AND METHODS

### 4 ANATOMIC SPECIMENS: 8 SIDES STUDIED

- 2 males/2 females, caucasian,
- 2 frozen/2 fresh
- 2 injected with latex/2 not injected

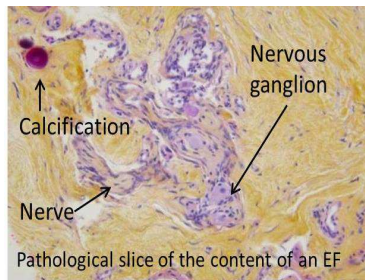
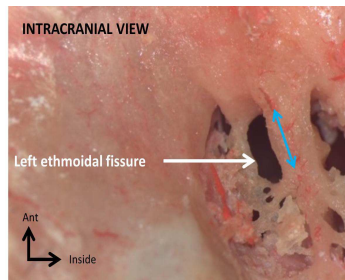
### 3 DIFFERENT STUDIES OF THE ANTERIOR CRIBRIFORM PLATE

- **ENDOCRANIAL STUDY**
  - After removal of CG and DM
  - Looking for EF and AES
  - Sampling of the content if present
- **HISTOLOGICAL STUDY**
  - Slicing, staining and examination of samplings
- **ENDOSCOPIC ENDONASAL STUDY**
  - Measurement of the distance between the Anterior Ethmoidal Artery (AEA) and Foramina



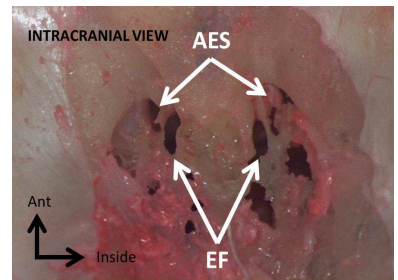
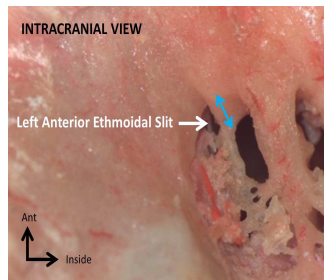
Endonasal view of a left nasal fossa

## EF IS PRESENT IN 100% OF CASES



- **ENDOCRANIAL STUDY:**
  - SHAPE: oval, 4 mm length [+/-1.22]
  - CONTENT: Fibrous tissue in contact with nasal mucosa, no nerve, no vessel
- **ENDONASAL ENDOSCOPIC STUDY:**
  - Distance from AEA: 5.25 mm [+/-1.49]
- **HISTOLOGICAL STUDY:**
  - Nervous and connective tissue on 2 pieces
  - Ca<sup>2+</sup> evocative of DM (1 piece)

## AES IS PRESENT IN 75% OF CASES



- **ENDOCRANIAL STUDY:**
  - SHAPE: oval, 1.75 mm length [+/-0.55]
  - CONTENT: Nerve and vessel (in 2/4 pieces)
- **ENDONASAL ENDOSCOPIC STUDY**
  - Distance from AEA: 5.8 mm [+/-1.17]
- **HISTOLOGICAL STUDY:**
  - Nervous and connective tissue on 2 pieces

## TWO LARGES FORAMINA ARE PRESENT AT THE ANTERIOR PART OF THE CRIBRIFORM PLATE



## THEY CREATE AN AREA OF WEAKNESS THAT COULD LEAD TO CSF-LEAKS AND ENCEPHALOCELES

- Freeze withered the HISTOLOGICAL SAMPLES
- More HISTOLOGICAL STUDIES ARE NEEDED because of discordance between ENDOCRANIAL AND HISTOLOGICAL STUDY

### TO READ

1- Rouvière H, *Précis d'anatomie et de dissection*, 1911 and later editions  
 2- Gray H, Spitzka E, *Anatomy, descriptive and applied*, 1913 and later editions  
 3- Jankowski R. Endoscopic resection of the olfactory cavity. Fr ORL 2007;93:341-6.  
 4-Dare AO, Balos LL, Grand W. Neural-dural transition at the medial anterior cranial base: an anatomical and histological study with clinical applications. J Neurosurg. 2003;99(2):362-365.  
 5- Vasvári G, Reisch R, Patonay L. Surgical anatomy of the cribriform plate and adjacent areas. Minim Invasive Neurosurg. 2005;48(1):25-33.

OUR ANATOMICAL STUDY DEMONSTRATES THE EXISTENCE OF BOTH FORAMINA. THE ETHMOIDAL FISSURE CLEARLY REPRESENTS AN AREA OF WEAKNESS AT THE ANTERIOR PART OF THE OLFACTORY CLEFT, WHICH COULD PREDISPOSE TO ANTERIOR SKULL BASE CSF-LEAK AND MENINGOCELES.