

# On the history of the Ermiro de Lima's approach to the ethmoid, sphenoid and frontal sinuses (preliminary report)

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## SUMMARY

*The original achievements of the Ermiro de Lima's transmaxillary approach are pointed out as well as the basic characteristics of this technique.*

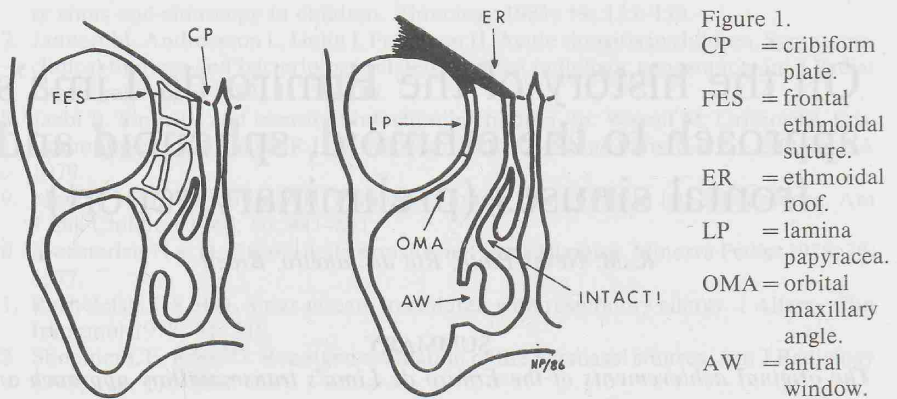
The idea of a transmaxillary approach (or transantral) to the ethmoid, sphenoid and frontal sinuses as proposed by Ermiro de Lima was conceived in 1930. In 1936 it was described for the first time and in 1943 a second publication followed, both written in Portuguese (Lima, 1936, 1943). The main characteristic of this method is a meticulous systematization which makes this kind of surgery a disciplinable, adequate and safe procedure.

The 1943 paper is a thesis and is, by far, Ermiro de Lima's most complete and detailed description of his technique. The thesis is divided into three chapters and in the first one the author discusses the general ideas on the evolution of the paranasal sinuses complex, stressing the importance of the ethmoid from the ontogenic and pathogenic point of view. In the second chapter the surgical approach ("from the anesthesia to the final retouches") is described. The third chapter consists of two parts: surgical clinical observations and anatomical clinical observations.

## TECHNICAL DETAILS

### *1. The basic surgical landmarks*

The basic surgical landmarks are the roof of the ethmoid and the lamina papyracea (Figure 1). In Ermiro de Lima's own words (Lima, 1943): "The cells of the ethmoidal labyrinth are destroyed and the ethmoidal bulla is the first one to be opened. We go up with the curette into the degenerated mass, flat to the lamina papyracea that is usually resistant and tolerates all the tangential manoeuvres to its surface. Continuing the curettage, now through the upper portion of the



ethmoid and always parallel to the lamina papyracea, we reach – at a depth of 1.5 cm – the upper resistant bony plate” (the ethmoid roof). “This upper bony plate, where the resistance is noteworthy and contrasts with the friable mass of the ethmoidal labyrinth is – in its external part – formed by the overflow of the vitreous lamina of the frontal bone, in the ethmoidal notch (Figure 1). The curette can safely be used in the inferior face of this lamina.”

## 2. The orbital maxillary angle

Referring to the orbital maxillary angle he says (Lima, 1943): “we stress the fact that this angle must be well-identified and smoothed because only by doing this we will have a direct and wide vision of the ethmoid roof” (Figure 1).

## 3. The sinus drainage

The drainage of all the paranasal sinuses – in open connection with each other after surgery – will be temporarily provided by the contra-aperture made in the inferior meatus (Lima, 1936, 1943) (Figure 1).

## 4. The middle meatus

The structures of the middle meatus are left intact (Lima, 1936, 1943) (Figure 1) in order to permit the recovery of ventilation and drainage of the sinuses through the natural ostia of this region (Lima, 1986).

## 5. The frontal sinus

“When arriving at the most anterior part” (in the ethmoid) “the tip of the curette will be oriented slightly outward in order to be able to enter the frontal sinus better” (Lima, 1943) (Figures 2, 3). In 1950 Geraldo de Sá demonstrated that such

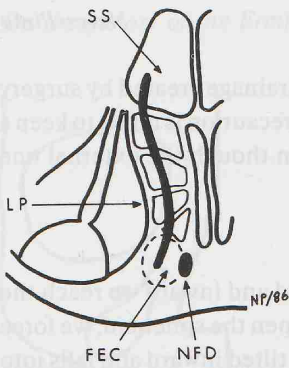


Figure 2.

FEC = frontal ethmoidal cell.

NFD = nasal frontal duct.

SS = sphenoid sinus.

LP = lamina papyracea.

The "S" indicates the curette route used to enter the frontal and sphenoidal sinuses.

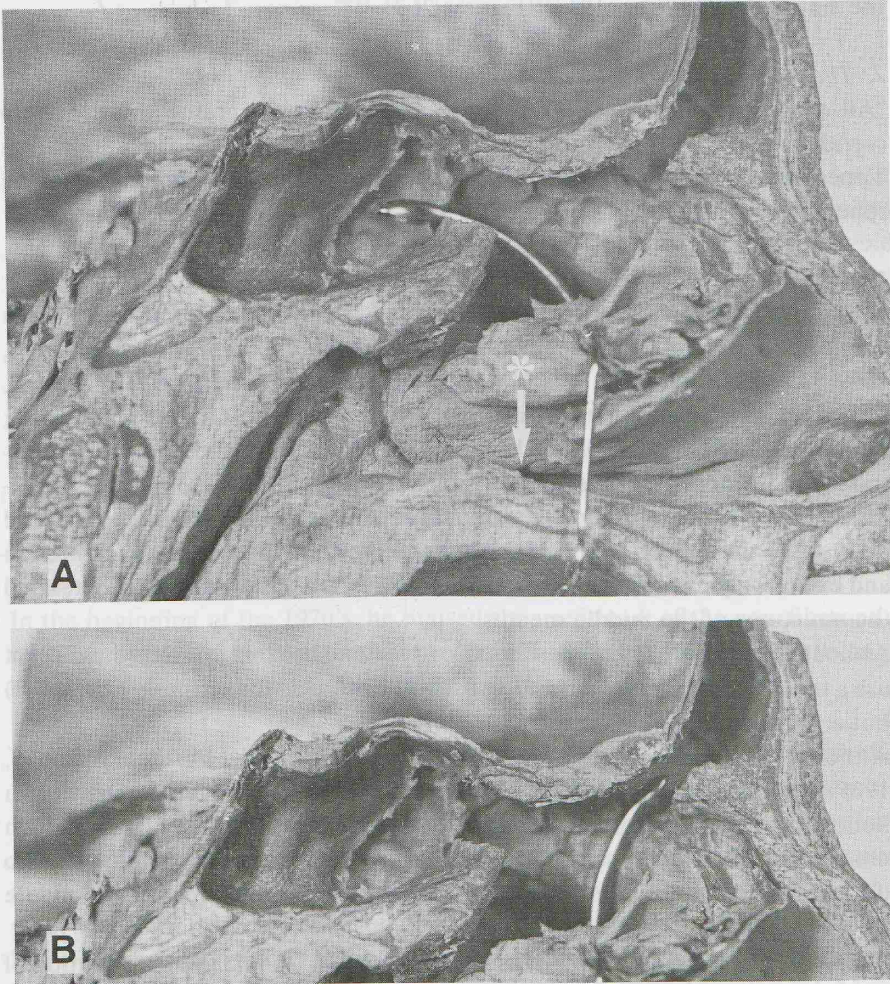


Figure 3. The "teto corrido" ("continuous roof"). Through a transmaxillary approach the curette enters the sphenoidal (A) and frontal (B) sinuses. For demonstration, after surgery, the lateral wall was sectioned in its upper limits and folded downward.

manoeuvre is fundamental because the frontal sinus drainage created by surgery will not be blocked by active osteogenesis "since that precaution is taken to keep a mucous lining in the inner margin of the ostium, even though the external one has been destroyed".

#### 6. *The sphenoid sinus*

"If we extend the maxillary sinus posterior wall upward and inward we reach the anterior wall of the sphenoid sinus. (...). If we want to open the sphenoid, we force an opening with the tip of the curette, which is slightly tilted inward and falls into the sinus cavity" (Lima, 1943) (Figures 2, 3).

#### 7. *The "teto corrido"*

"All these manoeuvres will be performed without discarding the (...) "teto corrido" (Lima, 1943). "Teto corrido" ("continuous roof") is a denomination coined by Marinho (1940) meaning the ethmoid roof in continuity with the sphenoid roof and the posterior wall of the frontal sinus (Figure 3).

### DISCUSSION

Despite the fact that many authors had used the transantral approach before Ermiro de Lima did (Jansen, 1894; Boenninghaus, 1897; Goris, 1898; Laurent, 1899; Luc, 1900; Winckler, 1900; Furet, 1901; Sieur and Jacob, 1901; Uffenorde, 1925; Horgan, 1926; Lautenschläger, 1926; Turnbull, 1929; Nishiata, 1930; Pietrantonio, 1935; Futch, 1936; Hicquet, 1936), it becomes clear that his contribution on the matter is original (Lima, 1936, 1943) because of: a. its systematization with clear and safe anatomical landmarks for the emptying and drainage of the sinuses operated on; b. its approach to the frontal sinus through and exclusively transantral access; c. its preservation of the nasal turbinates and the structures of the middle meatus.

Although Uffenorde (1925) described an access to the frontal sinus, he did not use a transmaxillary approach as proposed by Ermiro de Lima (Lima, 1936, 1943) but a transnasal one.

Although, according to some authors, the techniques used by Hishiata (1930, 1965) and Pietrantonio (1935) are similar to Ermiro de Lima's technique, we can notice that in both techniques a large opening of the middle meatus is made in order to provide a wide access to the ethmoid. Contrary to this procedure Ermiro de Lima stressed the importance of preserving the structures of the middle meatus (Lima, 1936, 1943).

However, it should be emphasized that - above all - the basic contribution of Ermiro de Lima was the adequate and safe systematization of the surgical procedure, which propiciated its popularization and incorporation to the current surgical repertory of the otorhinolaryngologist.

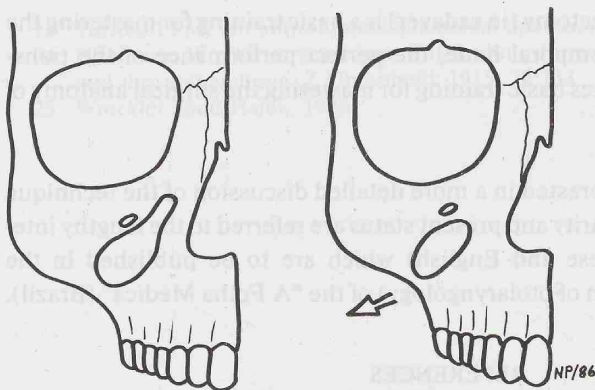


Figure 4. Opening of the maxillary sinus anterior wall as recommended by Ermiro de Lima in 1936 (left side) and 1943 (right side). If necessary, the opening may be enlarged in the arrow sense.

Ermiro de Lima in some way anticipated the modern endoscopic and conservative surgery of the paranasal sinuses when he recommended: a. a limited opening of the anterior wall of the maxillary sinus (Figure 4) in order to avoid damage to the anterior superior alveolar nerve (Lima, 1943); b. the preservation of all the healthy mucous membrane of the maxillary sinus (Lima, 1943) and c. the control of the surgical cavity with a salpingoscope (Lima, 1936).

Recently (1976), Ermiro de Lima adopted the Neumann's incision adding a personal modification. This incision is performed in the free margin of the gum to approach the anterior wall of the maxillary sinus, and was proposed to him by his followers R. M. Neves-Pinto and P. E. Lima. The combination of this incision with the practice of a limited opening of the maxillary sinus wall virtually eliminated the divulged sequelae produced by the surgery performed according to the method of Caldwell-Luc (Neves-Pinto, 1974; Neves-Pinto and Lima, 1981).

In the beginning of the 1970's, he praised the usefulness of the new fiberoptic telescopes with Hopkins rod lenses - modern substitutes of the ancient bulb lamp salpingoscopes - to control the surgical manoeuvres inside the sinuses.

In 1986 Ermiro de Lima's technique officially existed 50 years. Despite the growing prestige of the so-called conservative techniques Ermiro de Lima's transmaxillary approach is considered useful, at least in the cases of more or less radical surgery, like removal of gross and extensive pathologies in polysinusitis (including the maxillary sinus). Apart from a correct and precise diagnosis the strict observation of the surgical landmarks as referred to before, as well as perfect knowledge of the anatomy of the sinuses are of fundamental importance. There is a big difference between emptying an ethmoid and just crushing through it as is the case in most of the other techniques. Transmaxillary sinusotomy will be more precise and conservative if the fiberoptic telescopes are used. Furthermore, as

well as the radical mastoidectomy (in cadaver) is a basic training for mastering the surgical anatomy of the temporal bone, the perfect performance of the transmaxillary technic constitutes basic training for mastering the surgical anatomy of the paranasal sinuses.

Those readers who are interested in a more detailed discussion of the technique itself, its originality, popularity and present status are referred to the lengthy integral versions (in Portuguese and English) which are to be published in the "Caderno de ORL" (section of otolaryngology) of the "A Folha Medica" (Brazil).

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