

## **Orbital Transposition. Do we Need it?**

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### **Abstract**

The management of frontal sinus pathology represents a challenge for ENT surgeons. In the past, the external approach was considered the gold standard for the pathologies involving the frontal sinus, but with the development of endoscopic surgery new, minimally invasive procedures appeared. To endoscopically reach lesions that involve the lateral orbital roof, exposure of the frontal sinus should be increased. Orbital transposition is a new and innovative technique that aims to expand the frontal sinus.

In this paper, we will present the steps of the orbital transposition technique, and we will evaluate its utility and safety.

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### **1. Introduction**

**The management of frontal sinus pathology represents a challenge for ENT surgeons. In the past, the external approach was considered gold standard for the pathologies involving the frontal sinus but with the development of endoscopic surgery new, minimally invasive procedures appeared [1].**

There are three endoscopic endonasal approaches of the frontal sinus Draf I, Draf II a/b and Draf III [2]. The advantages of the endoscopic sinus surgery are faster recovery, no incision that leads to no scars and fewer side effects [2, 3].

Although, in recent years, the endoscopic technique is preferred by surgeons for frontal sinus lesions, there are some limitations and contraindications for this type of approach. When choosing an endoscopic approach, for the frontal sinus, the surgeon must take into consideration the anteroposterior diameter of the frontal sinus, the origin site of the lesion, if the location of the tumor is lateral or medial from the virtual sagittal line that passes through the lamina papyracea, the size of the tumor and erosions of the posterior sinus wall. Depending on these parameters, the surgeon decides between the endoscopic, external or combined approach [4, 5].

**However, in cases with lesions localized lateral to the mid-pupillary line, with the development of new multi angled instruments and increased surgical endoscopic experience exclusive endoscopic endonasal approach of the frontal sinus is possible [6].**

To reach lesions that involve the lateral orbital roof, exposure of the frontal sinus should be increased. Orbital transposition is a new and innovative technique that aims to expand the frontal sinus [6].

In this paper, we will present the steps of the orbital transposition technique, and we will evaluate its utility and safety.

## 2. Materials and Methods

By using the orbital transposition technique, the orbital content is transposed laterally after the superomedial wall of the orbit is drilled [7].

After performing Draf IIb or Draf III surgical procedures, the first step is identifying the anterior ethmoidal artery. The artery needs to be coagulated and carefully transected to prevent complications like massive hemorrhage or retrobulbar hematoma [7, 8].

**The second step is the complete exposure of the *lamina papyracea*.** Afterwards, the upper portion of the lamina is fractured and removed. During this maneuver, it is very important to preserve the periorbital layer intact as well as preserving the integrity of the trochlea of the superior oblique muscle to ensure normal eye mobility [9].

**The orbit is displaced laterally, with the help of a malleable retractor, to expose the floor of the supraorbital recess. The bony floor is drilled with a diamond burr and removed until the coronal plane is reached. The risks of this procedure are dural exposure and CSF leaks [10].**

By drilling the bone of the supraorbital recess, enough space is created for the surgeon to reach the lesions developed in the lateral aspect of the frontal sinus. Special surgical instruments like curved drills or shavers are needed to be able to reach the lateral area [11].

At the end of the surgical procedure, after the removal of the retractor, the orbit expands to its normal position [10].

## 3. Discussions

Traditionally, frontal sinus lesions developed in the lateral part of the frontal sinus were not eligible for endoscopic surgery, but for the external approach. The external procedures are the Howarth- Lynch procedure, The Lothrop procedure or the osteoplastic flap [11].

Lately, the indication for endoscopic surgery expanded with the advances made in instrumentation and with the increase of endoscopic surgical experience [11-13].

**However, the endoscopic approach is still not commonly used in case of lesions developed laterally from the mid- pupillary line. Surgeons must take into consideration certain aspects of the frontal sinus before choosing this approach. All these aspects concentrate on the anatomy of the frontal sinus [11].**

The pneumatization of the frontal sinus can be an obstacle for endoscopic surgery. If the sinus is well pneumatized chances of reaching lesions located on the lateral side of the sinus are small [11, 13].

The convexity of the orbital roof limits the access to the lateral aspect of the sinus as well [12]. For the passage of instruments, a minimum anteroposterior diameter of the frontal sinus is required [13].

**Orbital transposition is a new technique that increases the space of the frontal recess and allows access to the lateral part of the frontal sinus. This technique is challenging and requires training, experience and skill.** Also, special curved instruments are needed to be able to perform the surgery [14].

In choosing the correct approach and in establishing the surgical plan, radiological examination plays a very important role. Nevertheless, the assessment of the relationship between the frontal sinus and the lesion can, sometimes, only be done intraoperatively. This is one of the reasons why every surgeon must be trained to perform both endoscopic and external approaches. Another reason for this is that during any endoscopic surgery complications may arise, and the approach must be switched into an external one [15-18].

#### **4. Conclusions**

The endoscopic approach of the frontal sinus with orbital transposition is an alternative to traditional open surgery for lesions that develop in the lateral side of the mid- pupillary line [19, 20].

**Orbital transposition is a useful, yet challenging technique surgeons use in order to expand the frontal sinus and have better visibility of the lateral aspect. This type of surgery should be well planned ahead and only applied in selected cases where the anatomy of the frontal sinus allows the removal of the lesions with this technique. Surgeons need experience and special double curved instruments to perform this surgery and to reach the far later side of the sinus.**

However, even experienced surgeons face situations when the lesion developed in the frontal sinus cannot be resected endoscopically. In those cases, the endoscopic approach must be switched into an external one. **Our conclusion is that even if the endoscopic approach is preferred by many surgeons, the traditional external approach is very important and sometimes the best option for optimal surgical results.**

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## REFERENCES

1. Weber, R., Draf, W., Kratzsch, B., *et al.*, (2001). Modern concepts of frontal sinus surgery. *Laryngoscope* 111(1), pp. 137-146.
2. Nicolai, P., Tomenzoli, D., Lombardi, D., *et al.*, (2006). Different endoscopic options in the treatment of inverted papilloma. *Op Tech Otolaryngol Head Neck Surg* 17(2), pp. 80-86.
3. Ciuntu, B.M., Georgescu, S.O., Cirdeiu, C., Timofte, D., Azoicai, D., Tecuceanu, A., Moraru, D.C., Sc haas, C., Blaj, M., Tamas, C. (2017). Negative Pressure Therapy in Wounds Surgical Treatment. *Rev Chim* 68(11), pp. 2687-2690.
4. Becker S.S., Bomeli, S.R., Gross, C.W., Han, J.K. (2006). Limits of endoscopic visualization and instrumentation in the frontal sinus. *Otolaryngol Head Neck Surg* 135(6), pp. 917-21.
5. Yoon, B.N., Batra, P.S., Citardi, M.J., Roh, H.J. (2009). Frontal sinus inverted papilloma: Surgical strategy based on the site of attachment. *Am J Rhinol Allergy* 23(3), pp. 337-41.
6. Ledderose, G.J., Betz, C.S., Stelter, K., Leunig, A. (2011). Surgical management of osteomas of the frontal recess and sinus: Extending the limits of the endoscopic approach. *Eur Arch Otorhinolaryngol* 268(4), pp. 525-32.
7. Chiu, A.G., Vaughan, W.C. (2004). Management of lateral frontal sinus lesion and the supraorbital cell mucocele. *Am J Rhinol* 18(2), pp. 83-86.

8. Trimarchi, M., Bertazzoni, G., Bussi, M. (2013). Endoscopic treatment of frontal sinus mucoceles with lateral extension. *Indian J Otolaryngol Head Neck Surg* 65(2), pp. 151-56.
9. Haug, R.H. (2000). Management of the trochlea of the superior oblique muscle in the repair of orbital roof trauma. *J Oral Maxillofac Surg* 58(6), pp. 602-06.
10. Conger, B.T. Jr., Illing, E., Bush, B., Woodworth, B.A. (2014). Management of lateral frontal sinus pathology in the endoscopic era. *Otolaryngol Head Neck Surg* 151(1), pp. 159-63.
11. Hahn, S., Palmer, J.N., Purkey, M.T., *et al.*, (2009). Indications for external frontal sinus procedures for inflammatory sinus disease. *Am J Rhinol Allergy* 23(3), pp. 342-47.
12. Lombardi, D., Tomenzoli, D., Butta', L., *et al.*, (2011). Limitations and complications of endoscopic surgery for treatment for sinonasal inverted papilloma: A reassessment after 212 cases. *Head Neck* 33(8), pp. 1154-61.
13. Mitrofan, E.C., Timofte, D. (2016). All a surgeon should know about sleep apnea. *Obesity Surgery* 26(Suppl 1), pp. S177-S178.

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