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INDICATIONS OF THE CALDWELL-LUC PROCEDURE IN THE ERA OF ENDOSCOPIC SINUS SURGERY: A REVIEW

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ABSTRACT

Surgical treatment of chronic rhinosinusitis is indicated after failure of correctly conducted maximal drug therapy or the occurrence of complications. Radical maxillary sinus surgery has been abandoned nowadays, to the detriment of endoscopic sinus surgery, for several reasons, such as: increased incidence of complications, decreased healing rate compared to the endoscopic technique. The literature cites many situations in which the Caldwell-Luc procedure is used as a first-line surgical technique: recurrent chronic rhinosinusitis, malignant tumors of the maxillary sinus extending to the lateral wall of the nasal fossa and the pterygomaxillary space, the cases where an extensive approach to the pterygopalatine fossa is required –for ligation of the internal maxillary artery or the approach of the vidian canal in vidian neurectomy. The authors highlight the use of Caldwell-Luc procedure in endoscopic sinus surgery era, by reviewing the complications rates, indications and long-term effectiveness of the two surgical techniques.

KEYWORDS: Caldwell-Luc surgery, endoscopic sinus surgery, rhinosinusitis, bleeding, sinusocopy, histopathological score.

INTRODUCTION

The Caldwell-Luc procedure was first described in 1893. The American surgeon George Caldwell associates the surgical approach of the anterior wall of the maxillary sinus through a gingival-labial incision with the inferior meatotomy, while Henry Luc, French surgeon, describes the same procedure, but combined with middle meatotomy.[1] It was widely used until 3 decades ago as a standard surgical procedure to solve various rhinosinusal pathological cases, today with very limited indications due to the development of endoscopic surgical techniques.[2] Surgical treatment of chronic rhinosinusitis is indicated after failure of correctly conducted maximal drug therapy or the occurrence of complications. The Caldwell-Luc surgery involves opening the maxillary sinus at the level of its anterior wall through a gingival-labial incision, ensuring surgical drainage in the inferior meatus, in order to evacuate the pathological content.[3] It is an exceptional procedure, through which the endosinusal mucosa is completely removed, the patient's discomfort, both immediately and late postoperatively, being superior to endoscopic techniques.

Functional endoscopic sinus surgery (FESS) was first described in the 1970s,[4,5,19] then having a success rate (90%) similar to the Caldwell-Luc surgery in the treatment of recurrent chronic and acute maxillary rhinosinusitis.[6,7,16] Radical maxillary sinus surgery has been abandoned nowadays, to the detriment of endoscopic sinus surgery, for several reasons, such as: increased incidence of complications (10-40 %).[8,9,20] decreased healing rate compared to the endoscopic technique.[10]

Pentilla et al. support the effectiveness of endoscopic surgery in terms of ameliorating symptoms in chronic rhinosinusitis, compared to the Caldwell-Luc procedure.[9] Thus, endoscopic antrostomy is recommended as the first surgical procedure used in the treatment of chronic maxillary rhinosinusitis. On the other hand, the hospitalization of the patient who underwent a Caldwell-Luc type of intervention is much longer, 5-7 days postoperatively, compared to one day postoperatively in the case of endoscopic intervention.[11,18]

Complications of Caldwell-Luc Surgery Versus Fess

In the literature, there are numerous studies highlighting the complications associated with the Caldwell-Luc procedure, which limits the use of this procedure as a technique for surgical treatment of rhinosinusal pathology. A number of complications can also occur in

the case of endoscopic approach of the maxillary sinus. These can be both immediate (intraoperative and postoperative) and late.

If we refer to the intraoperative incidents and accidents in the two types of surgical interventions, bleeding is the main event described. Injury to the neuro-vascular bundle, by not identifying or not protecting it at the time of the incision in the labiogingival groove during the Caldwell-Luc approach, it can cause intraoperative hemorrhage with postoperative suborbital neuralgias. In the case of classical surgery, the injury of the internal maxillary artery by breaking through the posterior wall of the sinus surgery can trigger significant bleeding. Specialist studies report an incidence of bleeding complications of about 3%.[10,14,17]

Comparatively, functional endoscopic sinus surgery reports bleeding as part of minor (about 5%) and major (0.5 -1 %) complications. Diffuse bleeding from the nasal mucosa during endoscopic sinus surgery is more common, compared to severe bleeding from the sphenopalatine or anterior ethmoidal artery injury (the incidence reported by some authors is between (0.1%–0.8%).[12,13] A study conducted in 1996 evaluated intraoperative bleeding in classically operated patients (Caldwell-Luc) compared to endoscopic sinus surgery, demonstrating a lower value in FESS (53.0±71.8ml, respectively 297.5±339.5ml).

It is recommended as the first surgical procedure used in the treatment of chronic maxillary rhinosinusitis. On the other hand, the hospitalization of the patient who underwent a Caldwell-Luc type of intervention is much longer, 5-7 days postoperatively, compared to one day postoperatively in the case of endoscopic intervention.[11,15,21]

CONCLUSION

Although the endoscopic technique is the standard approach for the maxillary sinus pathology, certain areas of the sinus (anterior wall and floor) are more difficult to approach. The Caldwell-Luc procedure must mandatorily remain in the surgical repertoire of an otorhinolaryngologist, for exceptional cases 38.

Conflict of interest: The authors declare that there is no conflict of interest.

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