







MAXILLARY ANTROSTOMY BY CALDWELL-LUC APPROACH: CASE REPORT

ANTROSTOMIA MAXILAR MEDIANTE AO ACESSO DE CALDWELL-LUC: RELATO DECASO

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ABSTRACT

Although well reported in the literature, endoscopic antrostomy cannot provide full access to the maxillary sinus, a fact that raises some controversy about its extension. Caldwell-luc access antrostomy has been performed for more than 120 years, under general or local anesthesia, managing to ensure greater visibility of the area being explored. A 40-year-old female patient attended the maxillofacial service of the Hospital do Oeste - Barreiras (BA) for evaluation. She claims to be suffering from chronic sinusitis for approximately one year after undergoing endodontic treatment, with constant nasal obstruction on the right side and failing to reach a considerable improvement with the medication use. The proposed treatment was the maxillary antrostomy with Caldwell-luc approach, under general anesthesia, followed by the installation of a rigid drain for direct irrigation in the maxillary sinus through an opening in the lateral wall of the nasal cavity on the affected side. Caldwell-luc approach is a classic procedure in the literature and has remained as a hegemonic surgical technique for the treatment of sinusitis until functional endoscopic surgery has emerged, which has made a less invasive technique possible. However, the advances in endoscopic surgery find a barrier in the limitation of the area accessed by this type of procedure. Despite the possible complications regarding the technique, the Caldwell-luc approach remains as a plausible method for the treatment of maxillary sinus morbidities.

Keywords: Maxillary sinus. Sinusitis. Therapeutic irrigation.

RESUMO

Apesar de consagrada na literatura, a antrostomia endoscópica nem sempre consegue fornecer acesso absoluto à mucosa do seio maxilar, fato que suscita debates a respeito da sua extensão. A antrostomia mediante ao acesso de Caldwell-luc é realizada há mais de 120 anos, com anestesia geral ou local, e busca garantir maior visibilidade da área explorada. Sendo assim, o presente caso versa sobre paciente do sexo feminino, 40 anos, que comparece ao ambulatório de cirurgia e traumatologia bucomaxilofacial do Hospital do Oeste - Barreiras (BA) para avaliação. Refere sinusite crônica há aproximadamente um ano, após tratamento endodôntico, com constante obstrução nasal em lado direito e sem melhora com uso de medicamentos. O tratamento proposto foi a antrostomia maxilar com acesso de Caldwell-luc, com anestesia geral, seguido da instalação de dreno rígido para irrigação direta em seio maxilar, através de abertura na parede lateral da cavidade nasal do lado acometido. A antrostomia mediante acesso cirúrgico de Caldwell-luc é um procedimento clássico na literatura, tendo permanecido como técnica cirúrgica hegemônica para tratamento de sinusites até o surgimento da cirurgia endoscópica funcional, que possibilitou uma técnica menos invasiva. No entanto, os avanços da cirurgia endoscópica esbarram na limitação da área acessada neste tipo de procedimento. Apesar das possíveis complicações relacionadas à técnica, a cirurgia de Caldwell-luc permanece como um método viável para tratamento de morbidades do seio maxilar.

Palavras-chave: Irrigação terapêutica. Seio maxilar. Sinusite.

INTRODUCTION

The human embryo begins the development of head and neck structures in the first weeks of intrauterine life, culminating in the appearance of maxillary, frontal, esphenoidal and ethmoidal breasts, after the formation and pneumatization of their respective bones (VAID; VAID, 2015). The paranasal breasts possess a native human microbiota which, when internally unregulated or in contact with external pathogens, can result in a series of complications, such as chronic sinusitis and other infections (WILSON; HAMILOS, 2014).

Antrostomy is a means to relieve obstruction and discomfort in such abnormal situations as it aims to facilitate draining, introduction of medication, washing and visualization of the paranasal breasts (THOMPSON; CONLEY, 2015; KIM *et al.*, 2018). Caldwell-luc access antrostomy has been performed for more than 120 years, under general or local anesthesia, and consists of a lateral incision in the canine pit, elevation of the periosteum from the canine pit to the infraorbital foramen, followed by the opening of the antrum with a chisel or drill (OLIVEIRA *et al.*, 2010; DATTA; VISWANATHA; HARSHA, 2016).

However, despite being widely recommended in the literature, endoscopic antrostomy cannot always provide complete access to mucus in the maxillary breast, and as such provokes debate as to its extension. In this context, a curved microdebrider can be used to extend its reach (BESWICK *et al.*, 2015).

This treatment modality is frequently used in cases of odontogenic sinusitis, caused by periodontitis, pulpitis, abscesses and iatrogeny that cause bucosinusal communication in tooth extraction and implant surgery. As well as avoiding the involvement of other paranasal breasts, such as the ethmoidal and frontal, maxillary antrostomy should be used together with cause resolution and the decision to continue, or not, antibiotic therapy after surgery (UNGAR *et al.*, 2018).

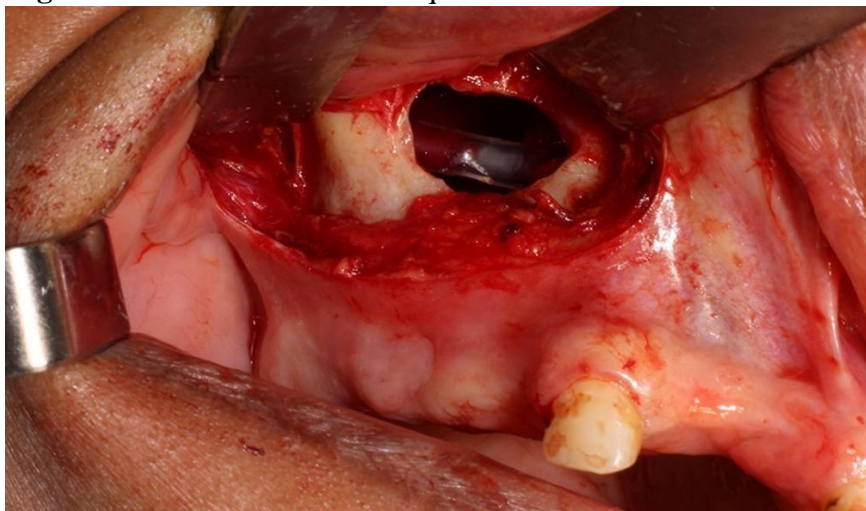
As such, this article reports a clinical case of maxillary breast odontogenic sinusitis treated by Caldwell-Luc antrostomy, addressing trans-operative and post-operative conditions.

CASE REPORT

A 40-year-old female patient sought treatment at the maxillofacial outpatient facility of the Hospital do Oeste - Barreiras (BA). She reported chronic sinusitis for approximately one year, following endodontic treatment, with constant nasal obstruction on the right side and no improvement with the use of medications.

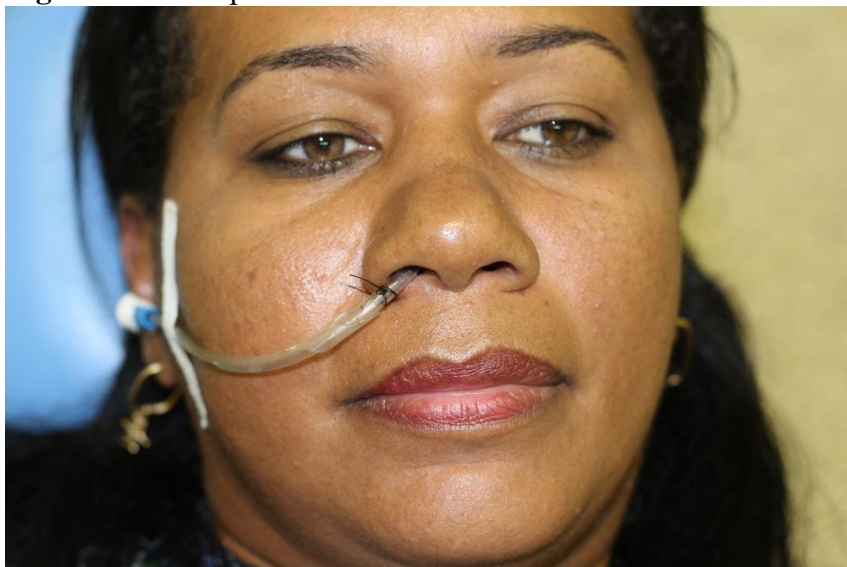
An intra-oral physical examination showed that there were edentulous regions; however, there were no signs of oro-antra fistula. A computerized tomography of the face and a panoramic radiography of the maxillaries were requested for complementary diagnosis. No bucosinusal communication was observed to explain the symptomology of the patient, but a veiling of the right maxillary breast was noted, suggesting mucus accumulation. The treatment proposed by the team was Caldwell-Luc access antrostomy, followed by the installation of a rigid drain for the direct irrigation of the maxillary breast, through an opening in the lateral wall of the nasal cavity on the compromised side.

The patient was given general anaesthetic, and underwent the following procedures, asepsis and antisepsis with chlorhexidine, infiltration with 2% lidocaine + epinephrine 1:200000 at the back of the right-side maxillary vestibule, two relaxing incisions in the alveolar mucosa with an inferior limit on the mucogingival line, mucoperiosteal detachment, bone exposure, and Caldwell-Luc access antrostomy with a spherical drill #8 to access the maxillary breast. For this surgery, the maxillary breast membrane is not preserved, granting direct access for irrigation with physiological serum and suction of the mucus causing the nasal obstruction (Figure 1).

Figure 1 - Caldwell-Luc Technique

Source: the authors.

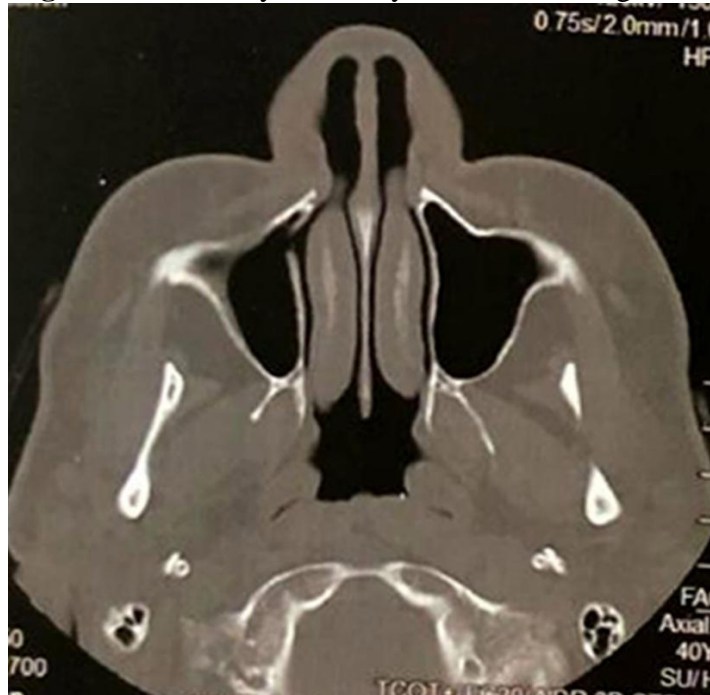
After unblocking, a Nelaton #10 probe is inserted, with the help of a hemostatic pincer, for the nasal mucus, passing through the maxillary breast. It is possible to see the probe inside the breast through the Caldwell-Luc access previously performed. As such, one end of the probe stays inside the maxillary breast and the other in the nostril so that the patient can perform daily irrigations (Figure 2).

Figure 2 - Probe position

Source: the authors.

Intraoral sutures, using Monocryl 4-0, and one stitch in the nose wing with Nylon 4-0, were used to close the opening and secure the probe. All procedures were conducted without complications.

The postoperative prescription was amoxiciline with potassium clavulanate, Dexametasone, Dipirone and Oximetazoline. The patient was instructed to perform two daily irrigations using a syringe containing physiological serum in the installed probe over a period of seven days (Figure 3).

Figure 3 - maxillary accessory ostium on the right

Source: personal archive.

At the first return visit, one week after, the patient's condition already showed significant improvement. She reported nasal unblocking, reduction of headaches and slight, sporadic nasal bleeding. The probe was removed and the patient was oriented to seek out an ENT specialist to treat her sinusitis, given that the surgical procedure alone could not provide a definitive cure.

Two months after the operation, she progressed without complaints of pain, without epistaxis, with an improvement in nasal obstruction and continued to be accompanied by both the ENT and buccomaxillofacial surgery and traumatology teams.

DISCUSSION

Caldwell-luc access antrostomy is a classic procedure, first documented in 1893 by George Caldwell. It continued as the unchallenged surgical technique for the treatment of sinusitis until the arrival of antibiotics and the development of functional endoscopic surgery, that contributed to the rise of less invasive procedures for paranasal breasts (OLIVEIRA *et al.*, 2010; HUANG; CHEN, 2012; ALBU; DUTU, 2017; BECKER; ROBERTS; BEDDOW, 2019).

However, the advance of endoscopic surgery encounters difficulty due to the limited area to which it can access, and the anterior recess of the maxillary breast is difficult to visualize using only this technique (THOMPSON; CONLEY, 2015; CERQUEIRA *et al.*, 2016; KIM *et al.*, 2018).

The endoscopic method does not permit total visualization of the maxillary breast, and as such, should be used together with a sinostomy in the canine pit region, which is very similar, in practice, to the Caldwell-Luc approach (JACOB; GEORGE; PREETHI, 2011).

In this way, to guarantee better visualization in endoscopic techniques, the combination of medium meatal antrostomy with inferior meatal antrostomy in a case series of 12 patients diagnosed with maxilar mucocele is something found after previous sinus surgeries.

Therefore, in order to guarantee a satisfactory visualization of the maxillary breast and pterygomaxillary fissure, the Caldwell-Luc approach is still recommended for sinusitis, mucocelles, fungal infections, tumors, buccosinusal communication, and for when endoscopic surgery fails or is not available (OLIVEIRA *et al.*, 2010; JACOB; GEORGE; PREETHI, 2011; HUANG; CHEN, 2012; CERQUEIRA *et al.*, 2016).

A scar in the left malar region, with hardness in the maxillary breast on the same side, was observed in a young, male patient, result of physical aggression involving a glass object.

A foreign body was confirmed in the left maxillary breast using computerized tomography, axial and coronal planes, and a hyper dense image with rupture of the anterior wall of the cavity observed. Due to the characteristics of the trauma and its location, Caldwell-Luc surgery under local anesthetic was performed to remove an approximately two centimeter shard of glass (CERQUEIRA *et al.*, 2016).

In one study of approximately 50 operations, the Caldwell-Luc technique was performed in 37 patients with chronic sinusitis, in which endoscopic meatal antrostomy had previously failed. Of the total, 92% had no subsequent infection in the maxillary breast and no need for a second intervention, and only 8% showed persistent symptoms or purulent secretion (CUTLER *et al.*, 2003).

In one sample of 53 patients who underwent Caldwell-Luc surgery, 79% registered facial edema as a complication immediately after the procedure, followed by epistaxis in 0.5%, three patients (DATTA; VISWANATHA; HARSHA, 2016).

In addition, a clinical prospective study about patients diagnosed with chronic maxillary sinusitis sought to evaluate the effectiveness of combining endoscopic techniques with the Caldwell-Luc intraoral approach to solve of this condition presented with and without the use of the buccal fat pad to undergo the buccal surgical gap. The study concluded that the combination of both techniques gave satisfactory results, with no statistical difference relating to complications between the groups studied. In this way, the importance of a multidisciplinary approach to chronic maxillary sinusitis is highlighted, involving ear, nose and throat (ENT) specialists and oral and maxillofacial surgeons (KENDE *et al.*, 2019)

In a retrospective study of 50 patients who underwent Caldwell-Luc surgery, the absence of severe epistaxis and nasal obstruction was noted, with only 02 cases of persistent oroantral fistulas over a period of 03 months of surgeries, these cases were later treated by way of a second surgery of the same type. As such, it is shown that it is a procedure of low risk and high efficacy (HUANG; CHEN, 2012).

CONCLUSION

Therefore, despite complications inherent to the technique and relative morbidity, Caldwell-Luc surgery is a versatile method and continues to be a safe treatment for morbidities in the maxillary breast.

Described in the 19th century by George Caldwell and Henri Luc, this therapeutic alternative possesses surgical technique and possible complications are well known, as are its indications for use.

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