CASE REPORT

CALDWELL LUC APPROACH - CURRENT SCENARIO
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ABSTRACT: During the last decades the endoscopic approach to sinus surgery has largely replaced the classical Caldwell Luc procedure, especially for chronic and recurrent maxillary sinusitis. However, the Caldwell-Luc procedure still has well documented indications and is used for managing antral polyps, neoplasms and acute and chronic sinusitis not responding to endoscopic sinus surgery. It is also used for better visualization of the sinus and when longer-lasting drainage is necessary. With several cases related to the maxillary sinuses, the surgical technique of Caldwell-Luc approach still allows very safe and very efficient exposure of these sinuses.

KEY WORDS: Caldwell Luc, maxillary sinus, antral polyp, chronic sinusitis

INTRODUCTION: Caldwell and Luc described the Caldwell-Luc operation more than 100 years ago as the surgical treatment for maxillary sinus disease. During the last decades less radical interventions using endoscopic approach have mainly replaced the classical procedures done for chronic and recurrent maxillary sinusitis. Despite this, the Caldwell-Luc procedure still has well documented indications in varied diseases involving the maxillary sinus.

CASE REPORT 1: A 50 year old male patient presented to our outpatient department with complaints of right sided nasal obstruction associated with intermittent facial pain since 3 months. On examination a pale, smooth mass was seen on the floor of the right nostril arising from the middle meatus. Oral examination revealed right sided palatal bulge with no restriction of palatal movements and normal dentition. A contrast CT scan of the paranasal sinuses showed a homogenously enhancing cystic mass in the right maxillary sinus (figure 1) and a provisional diagnosis of a maxillary sinus cyst was reached. The patient was posted for surgery under general anaesthesia. A right sublabial incision was taken and a bony window was created above the canine fossa. The entire cyst wall along with the maxillary sinus mucosa was peeled off the lateral and posterior walls as well as the floor of the maxillary sinus. An inferior meatostomy as well as a middle meatal antrostomy was made to facilitate adequate drainage of maxillary sinus. The histopathological examination revealed evidence of a simple epithelial cyst and postoperatively, there were signs of good mucosal healing.

CASE REPORT 2: A 60 year old male patient was referred to our outpatient department from the dental department with a history of migration of titanium implant screw migrated in the maxillary sinus. The dental implant was placed 1 month prior to presentation. A routine visit revealed absence of the implant from the alveolar margin. Subsequent CT of the paranasal sinus revealed the migration of the implant into the floor of maxillary sinus (figure 2). The patient was posted for immediate surgery under general anaesthesia. A right Caldwell Luc approach was taken to enter the
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maxillary sinus. The titanium screw was visualized, grasped (figure 3) and removed safely with no further consequences to the patient.

CASE REPORT 3: A 30 year old male patient presented with a right painless, palatal swelling (figure 4) since 3 years associated with intermittent straw coloured discharge expressed from the upper lateral incisors. The discharge was accompanied by reduction in size of swelling. Oral examination revealed a 4cm x 3cm x 1.5cm cystic mass over the right hard palate. Imaging studies revealed an expansile cystic-lytic swelling arising from the alveolar cortex of the right maxilla (figure 5). The patient was posted for surgery under general anaesthesia via a Caldwell Luc approach. A right sublabial incision was taken and the periosteum elevated upto the pyriform aperture. The alveolar bone overlying the cyst was carefully removed (figure 6). The cyst wall attached to the floor of the maxillary sinus was peeled off. The base firmly adherent to hard palate mucosa was left in-situ to prevent a fistula and the cyst was marsupialized draining into a right inferior meatostomy. The histopathology diagnosis of a dentigerous cyst was made with good postoperative healing.

DISCUSSION: The Caldwell-Luc operation was first described in the late 19th century as a technique to remove infection and diseased mucosa from the maxillary sinus via the canine fossa, while creating intranasal counter-drainage through the inferior meatus. However, in recent years endoscopic sinus surgery has evolved to become the standard surgical approach to address paranasal sinus disease. The central concepts of functional endoscopic sinus surgery (FESS) evolved primarily out of the detailed work of Messerklinger in evaluating mucociliary clearance patterns and endoscopic changes within the ostiomeatal complex and in incorporating computed tomography (CT) to image the ethmoid sinuses. Despite this, the Caldwell-Luc procedure still has well-documented indications in treatment irreversible mucosal changes. It provides better visualization of the sinus and is ideal when longer-lasting drainage is necessary. Barzalai et al. concluded in their study that the Caldwell-Luc approach is indicated for certain cases of inverted papilloma. The Caldwell Luc approach remains the procedure of choice in complicated maxillary foreign bodies. Other indications for a Caldwell-Luc approach include treatment of oro-antral fistulae and malignant exophthalmos, as an approach to biopsy the infraorbital nerve in cases of suspected perineural invasion by cancer; or to the orbital floor in the treatment of trauma; or to the pterygomaxillary space for ligation of the internal maxillary artery in the treatment of resistant epistaxis. It is also used to treat benign and malignant neoplasms of the lateral nasal wall, pterygomaxillary space, infratemporal fossa, and nasopharynx.

The advantage of Caldwell Luc approach is that it provides good access and can permit thorough inspection of the floor, roof and angles when used with a fibre-optic light probe. Areas of oedematous lining or polyps may be removed. Hosemann et al. report difficult areas to reach within the maxillary sinus via a middle meatalantrostomy approach that included the medial, anterior, and alveolar parts of the maxillary sinus. His study notes that “not even an additional inferior antrostomy offers help in all cases.” The three cases from our experience suitably illustrate that combining the Caldwell luc approach with intranasal middle meatal or inferior antrostomy along with fibre-optic 0° and angled endoscopes provides excellent visualization of these difficult areas and also helps in complete removal of disease.
The disadvantages of this procedure are facial swelling as a result of premaxillary fibrosis and thickening, facial pain and numbness from injury to the infraorbital nerve. Numbness of the teeth and gums is also one of the possible complications. These denervated upper anterior teeth is due to the damage to the anterior superior alveolar nerve when removing bone from the canine fossa region. Others include postoperative epistaxis, oro-antral fistulae and epiphora. Complications are nevertheless rare and can be minimized by using good surgical techniques like gentle tissue retraction during surgery, aided by a long or modified sublabial incision.

CONCLUSION: Although an endoscopic approach is the standard approach to the maxillary sinus during sinus surgery, certain areas of sinus (anterior wall and floor) are more challenging to address. With several cases related to the maxillary sinuses, the surgical technique of Caldwell-Luc approach still allows very safe and very efficient exposure of these sinuses and it should always be considered in surgical planning, when exploring this important anatomical structure. Caldwell-Luc procedure should remain in the otolaryngologist’s surgical repertoire for selected cases.

REFERENCES:

LEGENDS:

Fig. 1: CT scan image showing an enhancing cystic mass in the right maxillary sinus.
Fig. 2: Coronal CT image showing metal implant in right maxillary sinus.
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