

INDICATIONS, EFFECTIVENESS AND THE RESULTING COMPLICATIONS OF CALDWELL LUC PROCEDURE

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ABSTRACT

The Caldwell Luc procedure was introduced in the late 19th Century and was practiced extensively in the 20th century but with the advent of Endoscopes and minimally invasive procedure, the scope for radical Caldwell Luc procedure has declined in the recent past. The present study was conducted to evaluate the indications, effectiveness and the resulting complications of Caldwell Luc procedure. The study consists of 50 cases, of which 26 (52%) were male and 24 (48%) were females. Majority of the patients were of age group of 14 to 20 years and the most common symptom was nasal obstruction. The conclusion drawn from this study is, Caldwell Luc procedure has an important role in the treatment of recurrent antrochoanal polyp, benign lesions, removal of foreign bodies and other conditions which are inaccessible through endonasal procedures. This procedure is relatively simple with minimal intra operative and post operative complications which can be managed conservatively. In the present era, where radical procedures are being replaced by minimal invasive procedure, Caldwell Luc procedure still has certain indications.

KEYWORDS: Endonasal Procedures, Caldwell Luc, Endoscope

INTRODUCTION

The Caldwell-luc procedure was designed to remove irreversibly damaged mucosa of the maxillary sinus and to facilitate gravitational drainage and aeration via inferior meatal antrostomy. Though the frequency of Caldwell-luc procedure has reduced with the advent of the more conservative surgery like endoscopic sinus surgery, this operation still has been the indication for irreversible scarring of maxillary sinus, polypoid mucosal inflammation, and chronic inflammation associated with mucociliary dysfunction. These patients often are the poor candidates for endoscopic procedures or have failed such procedures because endoscopic middle meatus antrostomy precludes stripping of the irreversibly diseased mucosa of antrum in those with severely diseased sinuses, after middle meatal antrostomy alone. The mucociliary function is not sufficiently improved to allow for ciliary clearance of the sinus cavity: the secretions become stagnant, inspissated, and lead to chronic infection. These patients often require stripping of the diseased mucosa through

Caldwell-luc approach and a dependent site for drainage and irrigation of the maxillary sinus. Similarly, patients with Kartagener's syndrome and other disease of mucociliary function may be candidates for such dependent drainage of the maxillary sinus through an inferior meatus antrostomy because mucociliary function is not expected to develop to assist the sinus in clearing itself through the natural ostia. It also may be possible to accomplish such extensive surgery on the maxillary sinus through a large inferior meatal antrostomy using endoscopic techniques, but this has not been extensively reported.¹ In the recent past, the Caldwell-luc approach also was commonly indicated for those with chronic maxillary sinusitis with or without irreversible mucosal disease, antral choanal polyps, sinusitis of dental pathology, foreign bodies (displaced tooth roots), localized cellulitis of the maxillary sinus,⁸ as an access to pterygopalatine fossa, evaluation and

stabilization of orbital floor fracture or removal of orbital floor in decompression, trans sinus reduction of malar fracture.

In spite of its effectiveness and variety of indication, it can be associated with complications, such as swelling, numbness, pain, paresthesia, damage to tooth and oro antral fistula. It is the treatment of choice in adults for antrochoanal polyp since recurrence will be reduced. In children, once dentition is complete then simply polypectomy is replaced by the more radical procedure. All the lining mucosa of the sinus is removed with the polyp.² This study mainly aims to know the possible indications of the Caldwell-luc procedure and to understand the effectiveness and the complications that can be associated with the procedure.

MATERIALS AND METHODS

Source of Data: Out patients and inpatients attending the Government and Private set up

Sample size

The study consisted of 50 cases who had undergone the Caldwell-Luc procedure.

Inclusion Criteria

- Patients who have undergone Caldwell Luc procedure and have been followed up for at least 3 months.
- Patients who have undergone Caldwell Luc procedure after failure of endoscopic sinus surgery.

Exclusion Criteria

- Patient who have undergone diagnostic Caldwell Luc procedure
- Patients age <14yr
- Patients who failed to report for regular follow up.

Methods of Collection of Data

- Proper history was taken with the help of a proforma.
- Clinical examination
- Relevant investigations
- Caldwell-Luc surgery performed
- Post operative period analyzed

RESULTS

Table 1: Sex Incidence

Sex	Numbers	Percentage
Male	26	52 %
Female	24	48 %
Total	50	100 %

This study comprised of 50 patients of which 26 were males while 24 were females

Table 2: Age Distribution Status

Age (In Years)	Numbers	Percentage
0-10	0	0 %
11-20	20	40 %
21-30	13	26 %
31-40	6	12 %
41-50	4	8 %
51-60	4	8 %
61-70	2	4 %
71-80	1	2 %
Total	50	100 %

The age group distribution was vast with the lowest being of 14 years while the oldest patient being 75 years old. No cases below 10 and above 80 years. Most common age group was between 11 to 20 years (n=20, 40%) and 21 to 30 (n=13, 26%).

Symptoms: The most common symptoms were nasal obstruction and headache seen in over 90% of patients while other common symptoms included nasal discharge, sneezing, post nasal discharge, headache amongst others. Lesser symptoms included swelling seen in 1 patient (2%) and Anosmia (1 patient or 2%)

Table 3: Common Symptoms Were Nasal Obstruction

Symptom	Number	Percentage
Nasal obstruction	44	88 %
Nasal discharge	30	60 %
Headache	41	26 %
Post nasal discharge	11	12 %
Swelling	9	8 %
Olfactory disturbance	18	8 %
Sneezing	1	4 %
Miscellaneous	22	2 %

Indication

The most common indication of surgery was antrochoanal polyp (n=36, 72%) while other common indications were chronic sinusitis, dentigerous cyst, mucocoele etc. The rarer indications included cases of nasal cholesteatoma (rhinitis caseosa), maxillary Osteomyelitis and oroantral fistula.

Table 4: Common Indication Were Nasal Obstruction

Indication	Numbers	Percentage
Antrochoanal polyp	36	72%
Dentigerous cyst	3	6%
Mucocoele	3	6%
Osteomyelitis	2	4%
Oroantral Fistula	1	2%
Chronic Sinusitis	3	6%
Miscellaneous	2	4%

Clinical Finding: The most common clinical findings were that of a mass in the lateral nasal wall extending posteriorly onto the choana and filling the nasal cavity. These findings were consistent with the diagnosis of Antrochoanal polyp, which was the most common indication for surgery. Other clinical features such as sinus tenderness (n=21) and swelling over the cheek area (n=9) especially in cases of dentigerous cyst, rhinitis caseosa were also elicited.

Table 5: Major Findings

Finding	Number	Percentage
Mass	40	80
Sinus tenderness	21	42
Swelling	9	18

Anesthesia: Commonly used anesthesia was local anesthesia wherein preoperative packing was performed with 4% Lignocaine solution and infiltration was done with 2% Lignocaine with adrenaline solution. Infiltration was done in and around the required area and infraorbital block was also performed. This was done in the majority of the patients (n=30, 60%) while in the children and many female patients and as well as other anxious patients, general anesthesia was given (n=20, 40%).

DISCUSSIONS

The relevance of Caldwell Luc in the present day otorhinolaryngology practice has been confined to limited indications with the advent of endoscopes and functional endoscopic sinus surgery. However, certain indications still exist on this procedure as the amount of exposure provided by this relatively safe procedure is very vast. The access to the antrum is made easier and the disease can be directly visualized leading to complete removal of the polyp or mass as the case may be. Chronic sinus disease continues to be the most common indication of Caldwell-Luc surgery including antrochoanal polyp, chronic sinusitis and maxillary cyst. The similar result were reported by Geva B et al. In their series of the common indications of Caldwell-Luc they reported the rates of twenty (32%) patients had chronic sinusitis and 9 (15%) patients had suffered from nasal polyposis. The present study also observed the most common indication to be that of primary sinus disease. A clinical case of a 15 yr old female with dentigerous cyst, as reported by Yojana Sharma, Sundeep Kaushik, P.P. Singh was treated with Caldwell Luc procedure and was found at two months post operative to have no facial asymmetry or evidence of recurrence. Hence, the study concluded that the surgical enucleation combined with Caldwell Luc approach was treatment of choice in dentigerous cyst of the maxilla.⁶ Our study also used Caldwell-Luc procedure on 3 patients (6%) and reported full excision with no post operative recurrence. In a study conducted by SPS Yadav, Harshini Sharma, Jitender Kumar, Jagat Singh and Kuldeep, of 40 patients with maxillary sinusitis, 50% of patients were treated with Caldwell Luc with middle meatal antrostomy and another 50% by functional endoscopic sinus surgery with middle meatal antrostomy. It was found in the above study that the success rate of Caldwell Luc was 90% as compare to 80% of functional endoscopic sinus surgery but the complications were slightly higher in the Caldwell Luc procedure when compared to functional endoscopic sinus surgery.² although in our study no comparison with FESS was done, the success rate of Caldwell-Luc in maxillary sinus disease was over 98% with only 1(2%) recurrence which was similar to the above study. In a study conducted by A.B. Drake Lee it was concluded that the treatment of choice for antrochoanal polyp in adults is Caldwell Luc antrostomy, as the recurrence rate was lower than the other procedure. In cases of children, once the dentition is complete then the simple polypectomy can be replaced by Caldwell Luc procedure.⁵⁰ Our study also reported a very low recurrence rate of 2%. Walsh and Ogura reported a transantral approach to orbital decompression in 1957 to treat those patients with Graves' exophthalmos. Although transnasal endoscopic decompression of the orbit is suitable in many cases, wide exposure and maximal decompression is afforded by transantral orbital decompression. Our study did not include any case of exophthalmos. The most common complication reported was a transient swelling over the cheek which was managed with conservative treatment of local application of ice packs and anti-inflammatory medications. Similar findings were reported in series evaluation of review of 670 cases performed from 1975 to 1985 by DeFreitas and

Lucente.⁴⁴ Immediate postoperative complications of facial swelling (89%) and discomfort (33%), fever (12%), and hemorrhage (3%) was reported by them. The present study reports similar complication rates such as swelling over the cheek which was seen in around 70% of cases (n=35) and bleeding (50%, n=25). Complication rate comparison; Wigand et al. 45 in a report of 325 endonasal operations on the maxillary sinus advocated avoiding the Caldwell-Luc procedure because of a 45% incidence of resultant facial dysesthesia or neuralgia. Our study reports a similar incidence of anesthesia over the cheek area in (44%, n=22).

CONCLUSIONS

The Caldwell-Luc procedure is mainly indicated in conditions such as recurrent antrochoanal polyp, dentigerous cyst, and chronic sinusitis amongst others and also can provides adequate and wide exposure to the maxillary antrum and other areas such as posterior wall of the antrum to access both the inner antral area and other vital structures. The Complication rate is minor and manageable .In the era of Functional endoscopic sinus surgery, Caldwell-Luc procedure is indicated in certain conditions.

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