

Surgical Management of Chronic Rhinosinusitis in North Western Nigeria and Challenges for the Future

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Abstract

Background: Rhinosinusitis is usually treated medically. Surgical management is indicated when medical treatment fails or becomes complicated. Appraisal of various surgical methods employed in the treatment of chronic rhinosinusitis is the subject of this paper from a University teaching hospital in north western Nigeria.

Method: This is a review of 75 patients who underwent various conventional surgical operations for rhinosinusitis over a 5.5 year period from September 1999 to February 2005 who were followed up for a minimum period of 2 years.

Results: A total number of 177 surgical operations were carried out of which 75 patients either had some surgical procedures unilaterally, bilaterally or in combinations. There were thirty nine males (52%) and thirty six females (48%) with a male to female ratio of 1:1. Their age ranges from 8 years to 70 years with a mean of 31.1 years. The ages 21-40 years range constituted majority (65.3%) of the patients. Ninety-two operations (52%) were Caldwell-Luc (CWL) which was the commonest operation followed by forty-one (23.2%) cases of inferior meatal antrostomy (IMA), thirty-two (18.1%) cases of partial inferior anterior turbinectomy (PIT), Ten (5.6%) cases of frontoethmoidectomy (FTE) and Two (1.1%) cases of submucous resection of the septum (SMR). The indications for surgery were mainly persistent symptoms despite adequate medical treatment with radiologically confirmed evidence of ninety-seven nose or sinus pathologies in the seventy-five patients operated. These were: Chronic rhinosinusitis (CRS) with sinus opacity in fifty-four (55.7%) cases, CRS with polyps in eighteen (18.6%) cases, CRS with hypertrophic turbinates causing nasal obstruction in sixteen (16.8%) cases, CRS with frontoethmoidal mucoceles in five (5.2%) cases and CRS with sino-cutaneous fistula in two (2.1%) cases. Paraesthesia of the upper incisors was the commonest complaint after surgery for chronic maxillary sinusitis but at the fronto-ethmoidal region after

frontoethmoidectomy which usually improved gradually and eventually disappeared between 3 to 6 months. Symptom relief after surgery justified surgery in all patients while one case needed a revision surgery after two and a half years for a recurrent symptom. There has not been any need for further surgery for the rest of the cases after a minimum period of 2 years follow up.

Conclusion: Surgical management of rhinosinusitis in north western Nigeria was mainly for chronic rhinosinusitis and proved to be beneficial for relief of symptoms with minimal complications if patients are carefully selected either with failed medical treatment or with complications. The young population of twenty-one to forty years (65.3%) constituted the bulk of the patients with a peak at the 3rd decade and a mean age of 31.1 years.

Keywords: Chronic Rhinosinusitis, Surgical Management, North Western Nigeria

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Introduction

Rhinosinusitis has been widely accepted terminology used for the inflammation of the mucous membrane of the nose and paranasal sinuses since the mucous lining of the nose is continuous with the mucous lining of the paranasal sinuses and inflammation of one invariably involves the other.¹⁻⁶ Rhinosinusitis in this study was classified as acute or chronic based on temporal time frame of <12 weeks for acute and >12 weeks for chronic from clinical symptoms as defined by the European position paper on rhinosinusitis and nasal polyps¹. The European position paper on rhinosinusitis and nasal polyps in 2007 defined acute rhinosinusitis (ARS) as sudden onset of two or more symptoms, one of which should be either nasal blockade/obstruction/congestion or nasal discharge (anterior/posterior nasal drip) with or without facial pain and pressure, with or without reduction or loss of smell for <12 weeks with symptom free intervals if the problem is recurrent with validation by telephone or interview. Chronic rhinosinusitis (CRS) is defined as presence of two or more symptoms one of which should be either nasal

blockade/obstruction/congestion or nasal discharge(anterior/posterior nasal drip)with or without facial pain and pressure,with or without reduction or loss of smell for <12weeks with validation by telephone or interview .In its acute or chronic forms,it is usually managed medically first .Standard conservative treatment for rhinosinusitis is based on short or long term antibiotics and topical steroids with the addition of decongestants mostly in a short term regime and for the acute attack itself .Many other types of preparation have been investigated but substantial evidence for their benefit is poor . These medications include antral washings, isotonic/ hypertonic saline as nasal douche, antihistamine, antimycotics, mucolytic agents/ phytomedical preparations, immunomodulators/immunostimulants and bacterial lysate preparations¹. For selected patients with CRS, and gastrointestinal reflux, the impact of antireflux treatment on sinus symptom scores has been studied¹. If sinus infection is untreated or inadequately treated complications can develop requiring surgery¹⁻⁶.

In the pre antibiotic era, surgical drainage of the sinuses was a necessity in cases that failed to resolve spontaneously and were often potentially life threatening .The indications for surgery have changed somewhat with a host of effective medical therapies now available,but despite these a cohort of patients remain in whom surgery will be required⁷. Surgical management is indicated : When there is failed medical treatment despite over 12 weeks of adequate treatment with persistence of symptoms,When experience detects certain existing nasal conditions will not respond to medical treatment alone such as invasive fungal rhinosinusitis, maxillofacial fractures with grossly deviated nasal skeletal structure and sinonasal tumours,or the presence of complications. Complications could be orbital, osseous and endocranial though rarely some unusual complications can develop such as lacrimal gland abscess,nasal septal perforation,visual field loss, mucocoele or mucopyocele, displacement of the globe and septicaemia^{1,7-12}.

Surgical cases need adequate preoperative clinical, endoscopic, laboratory and radiological assessment to justify such interventions. Surgical management of rhinosinusitis could be endoscopic ,conventional or a combination of the two particularly where there are complications. Endoscopic sinonasal surgery has evolved over the years to replace conventional methods¹⁻⁷. However where facilities do not exist for standard endoscopic sinus surgery backed up by competent computerised tomographic(CT) or magnetic resonance imaging(MRI) facilities ,modification of the endoscopic

procedure or conventional surgical methods may be carried out. This paper reflects an appraisal of conventional surgical methods used in the region for the management of rhinosinusitis particularly of chronic variety and compares such results with similar methods and standard endoscopic procedures from centres in other parts of the world.

Materials and Methods

This is a review of surgical procedures carried out for patients with chronic rhinosinusitis over a five and a half year period from September 1999 to february 2005.All patients had basic laboratory investigations required for surgery carried out such as packed cell volume,serum electrolytes urea and creatinine,urinalysis ,random blood sugar and ECG for patients older than 35years.Plain xrays of the sinuses were routinely ordered but computerised tomographic scan(CT) was ordered for in some complicated cases or where the plain sinus xrays was not adequate to identify any specific pathology.

Surgical patients were discharged within one week of operation and thereafter seen as outpatient basis every month for 2-3 months and thereafter discharged from follow up but advised to report back if there was recurrence of any symptoms.Contacts were made with patients or relatives informally through phone who brought them to the hospital to ascertain the efficacy of surgical treatment offered compared to their premorbid state prior to surgery for a minimum period of 2years.Apart from one case of hypertrophic inferior turbinate who needed revision surgery(partial anterior end turbinectomy), after two and half years, all patients have been symptom free after surgery.

Results

A total number of 2242 patients were seen with rhinosinusitis during the period of study.Only 75(3.3%) patients underwent surgery .There were 39 males(52%) and 36 females(48%) giving a male to female sex ratio of 1:1 .The age range was 8-70years with a mean age of 31.1years.The 3rd decade of life accounted for the largest number of cases(36%) operated followed by the 4th decade (29.3%). The 21- 40 years age range alone accounted for 65.3% of all the cases operated while only one case(8years) that was operated was <10years(Table I).

The surgical operations carried out were 92 (52%) cases of caldwell Luc ,forty-one(23.2%)cases of Inferior meatal antrostomy, thirty-two(18.1%) cases of

partial anterior end inferior turbinectomy, ten(5.6%) cases of frontoethmoidectomy, and two(1.1%) cases of submucous resection of the septum(Table II). Some Patients had combinations of the different surgical procedures, unilaterally or bilaterally in one sitting in order to ensure relief of persistent symptoms. This explains why there were about 177 surgical procedures in the 75patients in this study.

There were 97 pathologic indications for surgery in the 75 patients operated, Some patients had more than one pathology and more than one sinus involvement. These were: Persistent symptoms of chronic rhinosinusitis(CRS) with sinus opacities in 54(55.7%) cases, CRS with polyps in 18(18.6%) cases, CRS with nasal obstruction from hypertrophic inferior turbinates in 16(16.5%) cases, CRS with frontoethmoidal mucocoeles in 5(5.2%) cases and CRS with sino-cutaneous fistula in 2(2.1%) cases, CRS with grossly deviated nasal septum causing persistent nasal obstruction in 2 (2.0%) cases Table III.

Paraesthesia and numbness were noted in all cases of inferior meatal antrostomy, thirty eight(41.3%) cases of caldwell luc over the upper incisors but disappeared within 3-6 months. Paraesthesia was noted in four (40%)cases that had fronto-ethmoidectomy at the frontoethmoidal region but this also disappeared within the same period.

Table I: showing age range distribution of patients surgically managed for chronic rhinosinusitis

AGE RANGE(YEARS)	NO OF PATIENTS (%)
0-10	1 (1.3%)
11-20	11 (14.7%)
21-30	27 (36.0%)
31-40	22 (29.3%)
41-50	10 (13.3%)
51-60	2 (2.7%)
61-70	2 (2.7%)
TOTAL	75 (100%)

Table II: showing surgical operations, age by sex distribution among the 75patients

TYPES OF SURGERY	NO(%)	SEX		TOTAL (%)	AGE RANGE (YRS)	MEAN AGE (YRS)
		No of Males	No of Females			
1. Caldwell Luc	92(52%)	26	21	*47(62.7)	15 - 70	31.1
2. Inferiormeatal Antrostomy	41(23.2%)	8	12	*20(26.7)	8 - 47	22.1
3. Partial Inferior Turbinectomy	32(18.1%)	9	7	*16(21.3)	18 - 47	21.3
4. Frontoethmoidectomy	10(5.6%)	7	2	*9(12)	13 - 60	27.8
5. SMR	2(1.1%)	1	1	*2(2.7)	35 - 38	36.5
TOTAL	177(100%)					

KEY: SMR Submucous Resection Of The Septum

*Some Patients had combinations of the different surgical procedures, unilaterally or bilaterally in one sitting.

Table III: Surgical indications of 97 pathologies

Surgical Indications	*No (%)
1. CRS With Sinus Opacity	54(55.7%)
2. CRS With Polyps	18(18.6%)
3. CRS With Persistent Nasal Obstruction From Hypertrophic Inferior Turbinates	16(16.5%)
4. CRS With Fronto Ethmoidal Mucocoeles /Potts Puffy Tumour	5(5.2%)
5. CRS With Grossly Deviated Nasal Septum Causing Persistent Nasal Obstruction	2(2.0%)
6. CRS With Sino-Cutaneous Fistula Left Frontal Sinus(1), Left Max Sinus(1)	2(2.0%)
TOTAL	97(100%)

KEY: CRS-Chronic Rhinosinusitis. *Some patients had more than one pathology and more than one sinus involvement.

Discussion

Surgical management of rhinosinusitis in carefully selected patients may prove useful in the relief of symptoms. Selection criteria should be from cases of failed medical treatment with persistence of symptoms, or cases with complications backed up by significant pathological findings from radiologic investigations. About 75 patients(3.3%) in this study were operated out of 2242 cases of rhinosinusitis seen during the period of study in the region. All were cases of chronic rhinosinusitis after failed medical treatment with definite clinical and significant radiological findings. From table 1 it can be concluded that the bulk of patients undergoing surgery for rhinosinusitis were mainly young people spanning the 2nd, 3rd, 4th decades of life with only one case(8years) less than 10 years old and a peak at the 3rd decade.

Conventional surgical methods such as caldwell-Luc, inferior meatal antrostomy, partial anterior end inferior turbinectomy, external frontoethmoidectomy were used in all the patients based on existing facilities in the centre and proved to be beneficial. In this region, patients pay for every procedure and where poverty is the case patient may not afford several hospital visits. The polygamous family structure demands that several needs of the family members must be met and spending on health issues not immediately urgent may be delayed as long as possible or left to fate or destiny. Therefore a surgical procedure must be convincing and justified to warrant acceptance of orthodox medical treatment. The conventional surgical methods allowed direct access to the various sinus pathologies in one sitting and provided longer symptom free periods even if patients were lost to follow up. These methods however are becoming less

popular in many countries all over the world due to increase in the use of endoscopic sinus surgery .

Ninety-two(52%) cases of Caldwell- luc and forty-one(23.2%) cases of inferior meatal antrostomy(IMA)carried out were the commonest surgeries in this study. This implies that the maxillary sinus was the commonest sinus involved. Ezeanolue et al, and Okafor from south eastern Nigeria, Nwawolo ,and Ogunleye et al, from south western Nigeria, Bhattia from north central Nigeria, Ahmad et al from north eastern Nigeria, and da Lilly-Tariah from south south region of Nigeria have reported maxillary sinus as the commonest sinus involved¹²⁻¹⁹. IMA was carried out primarily in some cases to replace the traditional proof puncture which was introduced by Nathaniel Highmore in 1651, Cowper in 1707 and Meibomius in 1718 through a tooth socket but John Hunter in 1835 introduced the intranasal approach to proof puncture⁷. IMA was done because one needed to secure an opening wide enough for either irrigation or endoscopic assessment of the antral cavities in the future and for sinus aeration and regeneration to continue long enough before closure of the antrostomy even if the patient was lost to follow up. IMA was first described by Gooch in 1770 but Krause in 1887, Mickulicz in 1887 and Lichtwitz in 1890 popularised the use of inferior meatal antrostomy⁷. In 1986, IMA was the most common operation performed by British otolaryngologist for chronic sinusitis but it has been superseded by middle meatal surgery^{7,20}. Ahmad et al²¹ and Ogunleye et al¹⁸ reported that IMA was the commonest sinus operation in Maiduguri north eastern Nigeria and Ibadan South western Nigeria. Complications may arise if the antrostomy is extended too far posteriorly or anteriorly⁷. If posteriorly the inferior meatal branch of the lateral sphenopalatine artery is encountered resulting in significant haemorrhage. Anterior extension may damage the branches of the anterior superior alveolar nerve plexus leading to altered dental sensation⁷. This was a common complication in cases in this study but resolved between 3-6 months.

IMA is usually done in Caldwell -Luc to facilitate gravitational drainage and aeration. Caldwell in 1893, Spicer in 1894 and Luc in 1897 described the Caldwell-Luc approach⁷. This procedure remains popular where facilities do not exist for endoscopic sino-nasal surgery. Paraesthesia from trauma or stretching of the infraorbital nerve is a common complication amongst others¹.

Partial anterior end inferior turbinectomy was carried out in 32(18.1%) cases of persistent nasal obstruction from

hypertrophic inferior turbinates. There were no cases of atrophic rhinitis following the procedure in any of the cases. We recommend it as safe in hypertrophic turbinates causing persistent nasal obstruction but one must be prepared to handle haemorrhage as a possible complication particularly in hypertensive cases where haemorrhage could be severe. Hypertensive patients need adequate blood pressure control and proper nasal preparations before nasal surgeries. No middle turbinectomy was carried out or middle meatal antrostomy in this series as advocated by some surgeons.

Transfacial frontoethmoidectomy was carried out in all cases of chronic rhinosinusitis of fronto ethmoidal origin. One of such cases had fronto-cutaneous fistula implying evidence of bony erosion as complication. A second case of sino-cutaneous fistula was from the left maxillary antrum. Ogunleye et al¹⁸ reported bony wall involvement in 32% of the cases reviewed in Ibadan Nigeria . They also reported some cases of intracranial complication in 5% of the cases¹⁸. We had no cases of intracranial extension requiring surgery in this study. Iseh et al²² reported cases of paranasal sinus mucoceles of the frontoethmoidal and sphenoidal origin with chronic rhinosinusitis as the only positive underlying predisposing factor in all cases who were operated transfacially through Lynch-Howarth incision.

A careful assessment and comparison of endoscopic approach with conventional surgical methods from several studies show over all advantage of endoscopic method over the conventional surgical approach mainly due to increasing shift from radical approach to conservative approach and avoidance of facial scars in experienced hands. In inexperienced hands endoscopic approach could be dangerous if not fatal. Pioneers in functional endoscopic sinus surgery, were once noted for radical sinus surgery but have introduced different techniques that have revolutionised endoscopic sinus surgery after several years of practice and perfection¹⁻⁷. Today surgical management has evolved to computer assisted sinus surgery with or without a navigational system while in some parts of United States of America balloon sinoplasty is gaining grounds^{1,7}. The challenge for the future is to acquire advances in skills and technology in the endoscopic approach and join the global trend. Until this is achieved, conventional external surgical management of chronic rhinosinusitis will continue to be the main approach in the treatment of chronic rhinosinusitis in this region and indeed many developing nations.

In conclusion , surgical management of chronic rhinosinusitis in north western Nigeria was mainly conventional external surgical methods and proved to be beneficial if patients are carefully selected with minimal complications. Partial anterior end inferior turbinectomy is

recommended as safe in cases of hypertrophic turbinates causing persistent nasal obstruction. The young population 21-40 years (63.5%) constituted the bulk of the patients with a peak

at the 3rd decade and a mean age of 31.1 years. Acquisition of advances in skills and technology in endoscopic sinonasal surgery becomes a major challenge for the future in order to compare results with other centres all over the world.

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