



## SURGICAL MANAGEMENT OF SINONASAL DISEASES– RETROSPECTIVE STUDY

**Dr. Ganeshkumar  
Balasubramaniam**

Senior Assistant Professor of ENT, Thanjavur Medical College, Thanjavur.

**Dr.  
Balasubramaniam  
Covindarasu**

Professor of ENT, Thanjavur Medical College, Thanjavur.

### ABSTRACT

**INTRODUCTION:** Commonest Sinonasal diseases are Deviated Nasal Septum with Sinusitis followed by Sinonasal Polyposis. Functional Endoscopic Sinus Surgery was the most effective than the other types of surgeries.

**OBJECTIVES:** Study about the various causes of sinonasal diseases present in our area and the various types of surgical management and its efficacy after regular follow up.

**STUDY DESIGN:** Retrospective study.

**MATERIALS AND METHODS:** Study conducted in ENT department Thanjavur Medical College. Period of study was April 2014 to March 2015. Total number of cases taken for study was 114. Malignancy and Deep Fungal infections of nose and paranasal sinuses are excluded. All cases are subjected to Diagnostic Nasal Endoscopy, CT PNS and Functional Endoscopic Sinus Surgery was done for most of the cases. Some recurrent cases treated with Caldwell-Luc surgery.

**RESULTS:** In our study Deviated Nasal Septum with Sinusitis was more in number followed by Ethmoidal Polyp, Antrochoanal Polyp and Septal deviation with Spur. FESS done for most of the cases and was most effective than other procedures.

**DISCUSSION:** Anatomical variation in the lateral wall of nose plays main role for the development of sinusitis. Anatomical and Pathological alterations in the (OMC)OsteoMeatalComplex leads to Defective Ventilation and Drainage and later on to Sinusitis. Ethmoidal Polyposis mainly associated with Allergy and Infection was common precipitating factor Antrochoanal Polyp. FESS gives best results with maximal mucosal preservation. Recurrent cases are managed by External Approaches such as Frontal Trephination and Caldwell-Luc surgery.

**CONCLUSION:** DNS with Sinusitis was more in number and managed by FESS. Ethmoidal Polyposis managed by FESS with Pre and Postoperative Medical management. Antrochoanal polyp managed by FESS, and in recurrent cases by Radical Antrostomy procedure.

**KEYWORDS:** Deviated nasal septum, Sinusitis, Ethmoidal Polyposis, Antrochoanal Polyp, Functional Endoscopic Sinus Surgery.

### INTRODUCTION:

Zaufal the first person used modified cystoscope for inspection of Eustachian tube orifice in 1880. Hirschmann was the first person inspected nasal cavity and maxillary sinus through tooth socket in 1903. Messerklinger in 1960 and Prof. Stammberger in 1985 started sinus surgery with the help of endoscope. The term Functional Endoscopic Sinus Surgery was coined by Kennedy in 1985 [1].

Hilding and Messerklinger demonstrated the Mucous Blanket that covering the epithelium and moves through the Natural Ostium to Nasopharynx. Anatomical variations in the Lateral Nasal Wall at the level of Osteomeatal complex will lead to defective ventilation and drainage of sinuses and develops sinusitis. Bassiouny's study reveals that the maxillary sinus mucosa in chronic sinusitis returns to normal if the ventilation and drainage improved by FESS[2].

Frontal sinus ostium and Maxillary sinus ostium are surrounded by Frontal recess and Ethmoidal Infundibulum respectively, which consists of fissures and clefts in the middle meatus all are part of Anterior Ethmoid. So the status of the above sinuses entirely depend upon the status of Anterior Ethmoid air cell [3].

Diagnostic Nasal Endoscopy plays major role for diagnosis of sinusitis and also used as therapeutic one. Supra Tubal Secretion (Postero Superior to Torus Tubaris) indicates involvement of Posterior group of sinuses such as Sphenoid and Posterior Ethmoid Sinus and Infra Tubal Secretion (Antero inferior to Torus Tubaris) indicates Anterior group of sinuses such as Frontal, Maxillary and Anterior Ethmoid sinus. CT-Paranasal sinus was mandatory for the plan of surgery.

Nasal polyposis mainly develops by Bernoulli's phenomenon. Polyp was defined as Non neoplastic, pedunculated, prolapsed, polypoidal paranasal sinus mucosa. Ethmoidal polyp common in chronic allergic rhinosinusitis. It was mostly bilateral, multiple and grape like polyp present at the level of ethmoidal infundibulum. Antrochoanal polyp was always unilateral and arising from the Accessory Ostium of the corresponding maxillary sinus.

The Bioelectric integrity of sodium and chloride channels are affected in the mucosal layer of polyp which in turn results in increased movements of water into the cell and increases in size of polyp. Polyp are devoid of sensory, autonomic and vasomotor or secretomotor nerves. This denervation decreases glandular secretion and increase abnormal vascular permeability leading to irreversible oedema [4].

Ethmoidal polyps are managed by Surgery using Powered instrument like Microdebrider with pre and postoperative steroid with antihistamine management. Regular DNE is essential to assess the recurrence. Antrochoanal polyp cases treated by FESS primarily and in recurrent cases by Sub labial Caldwell-Luc approach.

Profuse bleeding in Rhinosporidiosis was due to release of Vasodilator or substances like Histamine during manipulation. Juvenile Nasopharyngeal Angiofibroma presents with unprovoked and torrential bleeding. Bleeding in JNA may be due to defective muscular coat in tunica intima of vessel wall. Differential Diagnosis for unilateral nasal mass includes Compensatory Inferior Turbinate Hypertrophy, Sphenoidal Choanal Polyp and Rhinolith (Forgotten Foreign Body). DNE and CT-PNS are essential one for confirmation of diagnosis.

**OBJECTIVES:**

Study about the various causes of sinonasal diseases present in our area and the various types of surgical management and it's efficacy after regular followup.

**STUDY DESIGN:**

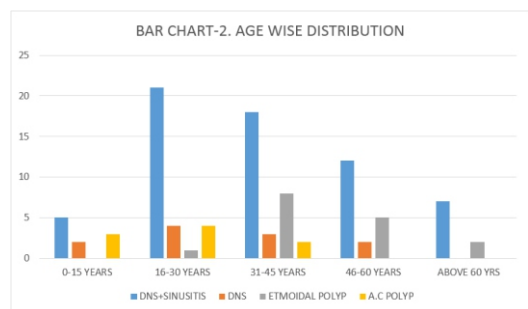
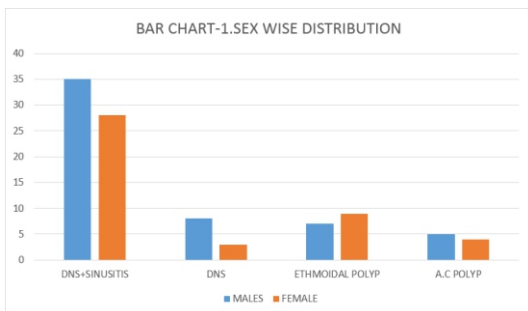
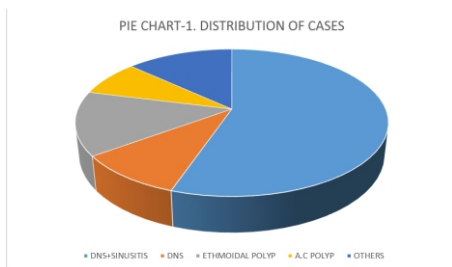
Retrospective study.

**MATERIALS AND METHODS:**

Conducted in ENT department Thanjavur Medical College Thanjavur. Period of study was April 2014 to March 2015(One Year). Total number of cases taken for study was 114. Malignancy and Deep Fungal infections of nose and paranasal sinuses are excluded. All cases are subjected to Diagnostic Nasal Endoscopy, CT PNS and Functional Endoscopic Sinus Surgery was done for most of the cases. Some recurrent cases treated with Caldwell-Luc surgery.

**TAB-1: DISTRIBUTION OF CASES**

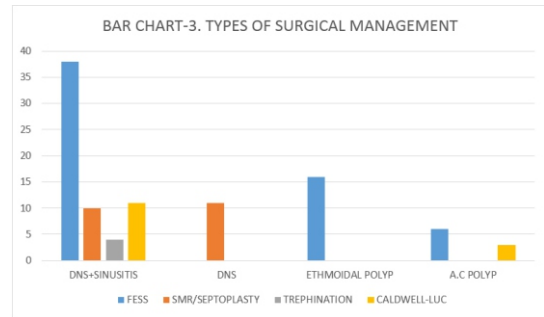
TYPE OF CASES	NO.OF PATIENTS	PERCENTAGE
SEPTAL DEVIATION AND SINUSITIS	63	55%
SEPTAL DEVIATION	11	10%
ETHMOIDAL POLYP	16	14%
ANTROCHOANAL POLYP	09	08%
OTHERS	15	13%



**TAB-2. ANATOMICAL VARIATION IN LATERAL NASAL WALL (DNE FINDINGS)**

ANATOMICAL VARIATION	NO.OF CASES (74) DNS+SINUSITIS & DNS	PERCENTAGE
MEDIALISED UNCINATE	15	20%

CONCHO BULLOSA	18	24%
PARADOXICAL MIDDLE TURBINATE.	08	11%
HIGH SEPTAL DEVIATION	08	11 %
AGGER NASSI PROMINENT	06	08%
ACCESSORY OSTIUM	12	16%
PROMINENT BULLA	07	09%



**RESULTS:**

Tab-1 and Pie-Chart-1 shows the distribution of cases. Deviated Nasal Septum with Sinusitis cases(63) are more in number and constitutes 55% of total cases, followed by Ethmoidal Polyposis (16), Septal Deviation (11) and Antrochoanal Polyp(9 cases). Other cases are Nasolabial Cyst(3), Benign Mass nasal cavity(3), Rhinosporidiosis(2), Rhinolith(2),Atrophic Rhinitis(2),JNA(1), Oro-AntralFistula(1) and Fibrous Dysplasia(1).

Bar Chart-1 reveals sex wise distribution of cases. Overall Males are affected more than Females except the Ethmoidal Polyposis mostly involved in Females.

Bar Chart-2 shows age wise distribution of cases in our study. Deviated nasal septum with sinusitis commonly involved in 16-45 years (39 cases). Antrochoanal Polyp cases are common in below 30 years. Ethmoidal polyposis cases are common in 31-60 years.

Anatomical variations in Lateral wall of nose during DNE are listed in Tab-2.

Conchobullosa present in 18 cases followed by Medialised Uncinate Process-15, Accessory Ostium-12, Paradoxical Middle Turbinate -8, High Septal Deviation -8, Prominent Agger Nassi cell-6 and Prominent Bulla Ethmoidalis in 7 cases.

Bar Chart-3 shows the various types of Surgical management. It shows that FESS was done for most of cases (60) and contributes 61% and it was most effective compare to other modalities of treatment. Sub Mucosal Resection of septum / Septoplasty done in 21 cases. Chronic and recurrent problems in Maxillary sinuses are managed by Caldwell-Luc procedure and for Frontal sinus –Trephination.

Rhinosporidiosis was managed by Excision of mass and Cauterisation of base to destroy the spores& to avoid recurrences. Atrophic Rhinitis was managed by Modified Young's procedure. Fibrous Dysplasia, Nasolabial Cyst and Oroantral fistula are managed by Sub labial Caldwell-Luc approach. Rhinolith was removed endoscopically under anaesthesia. JNA was removed completely with prior embolization of feeding vessel. Benign mass of nasal cavity was removed by Lateral Rhinotomy approach in case of very large size.

**DISCUSSION:**

FESS has now become widely accepted as definite and safe surgical procedure for sinus disease. Main goals of the Endoscopic sinus

surgery are Maximum Mucosal preservation and create communication between nasal cavity and paranasal sinus natural ostium for better drainage and ventilation. Because of the above achievement the term 'Functional' was used in FESS [5].

Common indications for FESS are Chronic Maxillary, Ethmoid, Frontal and sphenoiditis and Nasal polyposis. Mucocoele of frontoethmoid sinus, Dacryocystorhinostomy and limited inverted papillomas are also treated by Endoscopically. There was no definite contraindication for FESS. Uncontrolled hypertension, bleeding disorder and acute infective stage can lead to excessive bleeding during removal of nasal polyp or some nasal masses [6].

For a complete FESS the following 4 lamellas should be removed. 1st – Uncinate process, 2nd – Anterior wall of Bulla, 3rd – Basal lamella or Ground lamella and the 4th lamella was Posterior wall of Posterior ethmoid sinus. Anterior and Posterior Ethmoidal arteries are important one during this surgery. Uncinectomy or Infundibulotomy for Maxillary sinus disease clearance. Maxillary sinus opening was widened (MMA) by communicating the natural and accessory ostium into a single and large one. Accessory ostium was present in Membranous part of lateral nasal wall (Fontanel). Depending upon the relationship with Uncinate process, the fontanel divided into Anterior and Posterior Fontanel. 70% of accessory ostium present in Posterior Fontanel. Presence of Accessory Ostium indicates previous episode of sinusitis [7].

Sphenoid sinus disease can be approached by Trans septal (Rostrum of Sphenoid), Trans nasal (Sphenoid ethmoid recess) and Trans ethmoid (thorough all 4 lamellas). Sphenoid sinus Ostium located 7cm from the base of columella at 30 degree angle with floor of nasal cavity. Average capacity was 6-7.5ml. Congenital bony defect in lateral wall of sphenoid sinus (lateral Craniopharyngeal canal) is called Sternberg's canal and is the commonest cause for congenital CSF leak. All these should be identified preoperatively by CT PNS [8].

Frontal sinus develops from Frontal recess Furrow (41%), from frontal recess (18%) itself, from the extension of ethmoidal infundibulum (16%), from the infundibular cells (24%) and from Suprabullar cells (1%) [9].

The first cell to be removed during Frontal sinus surgery was Agger nasi cell, and sometimes Frontoethmoidal cells. All these cells are assessed preoperatively by CT-PNS. Wormald's concept of developing 3D building block prior to surgery is useful one by that we can avoid damage to adjacent vital structures [10]. Angled scopes such as 45deg or 70 deg. are commonly used for frontal sinus surgery. Giraffe forceps was used for curette the frontal sinus.

'Samter's triad' comprises of Nasal polyposis, Asthma, and Aspirin hypersensitivity. Kartagener's syndrome and Young's syndrome also important causes for ethmoidal polyposis. Steroids play main role in management of ethmoidal polyposis both preoperatively and post operatively. Initially in the dose of 1mg/kg/day in divided doses and later on tapered. Post operatively inhaled steroid is essential one [11].

Commonest cause for recurrence in ethmoidal polyp was incomplete removal of polyp. Preoperative CT-PNS is very important one and it should be done after one course of medical management. Bassiouni and Wormald study shows that recurrence rate of polyp after 6 months was 19.8% and after one year the recurrence rate was 27.2%. First site of recurrence of the polyp was in Frontal sinus/ostium area (55%) followed by ethmoids (38%). So polyp clearance in frontal recess region indirectly reduces recurrence rate of ethmoidal polyp [12].

All cases followed regularly and subjected to Diagnostic Nasal Endoscopy and the recurrence assessed early and proper management executed. Minor complications like Synechiae are managed by incision of the synechiae with simple packing in OPD itself. Post operative saline nasal drops/spray promotes mucociliary clearance by flushing out mucus, crusts and irritants. Other benefits are enhanced mucociliary beat activity, removal of antigen, biofilm or inflammatory mediators and a protective role on sinonasal mucosa [13].

#### CONCLUSION:

DNS with Sinusitis was more in number and managed by FESS. Ethmoidal Polyp cases are managed by Functional Endoscopic Sinus Surgery with Pre and Postoperative Medical management. Antrochonal polyp was managed by FESS, and in recurrent cases of Maxillary sinus by Caldwell-Luc procedure and for Frontal sinus by Trephination. Regular follow up was important for a better result.

#### REFERENCES:

- Kennedy DW, Zinreich J, Rosenbaum AE, Johns M. Functional Endoscopic Sinus Surgery. Theory and Diagnostic evaluation. Arch Otolaryngol, 1985; 111:576-582.
- Bassiouny A, Atef AM, Raouf MA, Nasr SM. Ultrastructural ciliary changes of maxillary sinus mucosa following functional endoscopic sinus surgery: an image analysis quantitative study. Laryngol Otol, 2003; 117 (4):273-9.
- Stammberger H. Endoscopic endonasal surgery concepts in treatment of recurring rhinosinusitis. Part I. Anatomic and Patho-Physiological considerations. Otolaryngol Head Neck Surg 1986; 94: 143-147.
- Niels M, Lund VJ. Nasal polyposis in Scott Brown's Otolaryngology and Head and Neck Surgery, Vol. 2, 7th edition. pp. 1549-59.
- Darling P, Petersen CG. Results Functional Endoscopic Sinus Surgery. Ugeskr Laeger. 2006 Mar 6; 168(10): 1034-7.
- Dalziel, Stein K, Round A, Garside R, Royale P. Endoscopic sinus surgery for excision of nasal polyp: A systematic review of safety and effectiveness. American Journal of Rhinology. 2000 sep-oct, 20(5): 506-19.
- Levine HL. Functional Endoscopic Sinus Surgery: Evaluation, surgery & follow up of 250 patients. Laryngoscope 1990; 100: 79-84.
- Sareen D, Agarwal AK, Kaul JM. Study of sphenoid sinus anatomy in relation to endoscopic surgery. Int J Morphol. 2005; 23(3): 261-6.
- Marquez S, Tessema B, Clement PA, Schaefer SD. Development and Extramural migration: the anatomical basis of paranasal sinus. The Anatomical Records. 2008; 291: 1535-53.
- Reitzen SD, Wang EY, Butros SR, et al. Three Dimensional reconstruction based on Computed Tomography images of the frontal sinus drainage pathway. Journal of Otolology and Laryngology. 2010; 124: 291-6.
- Mulloj, Obando A, Pujols L, et al. Corticosteroid treatment in Chronic rhinosinusitis: the possibilities and the limits. Immunol Allergy Clin North Am. 2009; 29(4): 657-68.
- Bassiouni A, Wormald PJ. Role of Frontal sinus surgery in nasal polyp recurrence. Laryngoscope. 2013; 123(1): 36-41.
- Harvey RJ, Schlosser RJ. Local drug delivery. Otolaryngol Clin North Am. 2009; 42: 829-45.