Original Research Article

A Hospital Based Comprehensive Study to Evaluate the Complications of Various Endoscopic Sinus Surgery in Patients Under General Anaesthesia

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Abstract

Background: The work of Endoscopic Sinus Surgery is now at the level of medical care with chronic and recurrent sinusitis. The endoscope even improves postoperative performance management to facilitate the speedy recovery and early detection of any recurrent infections. The purpose of this study was to examine the various complications of endoscopic sinus surgery. **Materials & Methods:** The study was a prospective study done on 50 patients attending the outpatient department of the Otorhinolaryngology at Government Medical College, Sikar, Rajasthan, India during five months period. All the patients were subjected to a detailed ENT clinical examination. Diagnostic nasal endoscopy was done for all the patients. If there were findings suggestive of sinusitis, osteomeatal complex disease, the patients were subjected to radiological examinations like X-ray Paranasal Sinuses and Computed Tomography Scan Paranasal Sinuses. **Results:** Age of the patients participated in this study is from 13 years to 60 years. out of 50 patients, 30 were males (60%) and 20 were females (40%). The incidence of major complication and minor complications was 2% & 12% respectively. 30% of the patients underwent anterior ethmoidectomy in addition to uncinectomy and middle meatal antrostomy. 30% of the patients underwent posterior ethmoidectomy also in addition to the above. 16% of the patients underwent frontal recess surgery in addition to uncinectomy, middle meatal antrostomy, anterior and posterior ethmoidectomy. 8% of the patients underwent sphenoidotomy in addition to uncinectomy, middle meatal antrostomy, anterior and posterior ethmoidectomy and 16% of the patients underwent uncinectomy, middle meatal antrostomy, anterior and posterior ethmoidectomy, frontal recess surgery and sphenodotomy. **Conclusion:** We concluded that with successful endoscopic sinus surgery, a clear understanding of anatomy is essential. Knowledge of anatomic relationships and diversity helps surgeons avoid complications.

Keywords: Endoscopic Sinus Surgery, Complications, Nasal Endoscopy, Chronic Sinusitis, Nasal Polyp.

Introduction

The nasal endoscope has dramatically altered the diagnosis and treatment of nasal congestion and paranasal sinuses. The work of Endoscopic Sinus Surgery is now at the level of medical care with chronic and recurrent sinusitis. It is the most exciting recent development in the field of Otorhinolaryngology. While working we have the opportunity for better lighting and clearer vision with minimal non-invasive surgery. The endoscope even improves postoperative performance management to facilitate the speedy recovery and early detection of any recurrent infections.

Stammberger[1], Messerklinger[2], Wigand[3], and Kennedy and colleagues[4,5] formed a shift in the thinking and management of nasal surgery. The ability to use endoscopy of the nose to diagnose, diagnose sinus and internal pathology in the lower extremities and edges of the nose, and delicate treatment of the disease has benefited the patient with more precise surgery, functional preservation, and faster healing.

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Since its launch, the concepts of endoscopic sinus surgery continue to emerge as a result of increased understanding of anatomy, improved endoscopes and video equipment, new instruments, and improved technology.

Endoscopic surgery aims to maintain body function and anatomic structure. The size of the operation is adjusted according to each case. It focuses on osteomeatal problem in the middle meatus and the ethmoidal cells. The term Functional Endoscopic Sinus Surgery (FESS) is used to draw attention to the possibility of regenerating the sinus drainage and mucosal restoration. Because of the variables individual nature and close association with orbit, anterior cranial fossa and vascular structures, sinus surgery has many potential problems[6].

Excellent insight into the latest advances in endoscopic technology and detailed preoperative and intra operative analysis of complex anatomy with advanced radiographic Computed Tomography scan technology, Magnetic Resonance Imaging scanner and imaging systems that help reduce potential complications. The surgeon's experience and familiarity with endoscopic anatomy and its variability play a vital role in reducing the severity[7]. With FESS, good results can be achieved consistently, as long as the surgery is performed with precision and care. The purpose of this study was to examine the various complications of endoscopic sinus surgery.

Materials & methods

The study was a prospective study done on 50 patients attending the outpatient department of the Otorhinolaryngology at Government Medical College, Sikar, Rajasthan, India during five months period.

Inclusion Criteria

1. Patients with chronic sinusitis / sinonasal polyposis, not responding to intensive medical management (at least 6months) and with supportive Diagnostic Nasal Endoscopy and radiological findings were selected for endoscopic sinus surgery
2. Age group above 14years and below 60 years

Exclusion criteria

1. Pathologies like lesions of the pituitary, orbit, lacrimal apparatus, intracranial complications of sinusitis and neoplasm
2. Gross septal deviation, in which endoscopic sinus surgery could not be performed without septal correction.
3. Patients with systemic disease.

Methods

Detailed history of complaints and their duration were obtained. Prior medical and surgical history was obtained. All the patients were subjected to a detailed ENT clinical examination. Diagnostic nasal endoscopy was done for all the patients. If there were findings suggestive of sinusitis, osteomeatal complex disease, the patients were subjected to radiological examinations like X-ray Paranasal Sinuses and Computed Tomography Scan Paranasal Sinuses.

Surgical Technique

The procedure is performed under general hypotensive anesthesia. The end of the patient's head was slightly raised to 15 ° instead of reverse Trendelburg. The nostrils are tightened and held in place by 4% lignocaine containing oxymetazoline - a wet cotton swab dipped in the inferior meatus and middle meatus and left in place for ten minutes. Throat packing is done.

It is very important to remove the uncinate process completely, from the upper attachment to the lower cover of the maxillary antrum. Injecting 1% lignocaine, containing 1 / 100,000 adrenaline, should be done 10 minutes before incision. The internal attachment of the uncinate process is inserted with a scissors knife. The bottom attachment was largely removed using Tru-cut forceps. The remaining fragments of the uncinate bone are removed to expose the hiatus semilunaris completely from the anterior to the ostium of the antrum.

If the bulla ethmoidalis does not change, the front attachment is usually the base of the skull and forms the posterior boundary of the frontal recess. The frontal recess probes can be used as a separator to remove polyps and polypoid variables from the recess for removal. This configuration can be further confirmed with transillumination of the frontal sinus with the endoscope placed within the recess or with image-guidance technology.

The ostium is probed first with the antrum probe. If it is determined that a larger ostium is necessary, the straight endoscopic scissors is inserted and incised posteriorly. The backbiting forceps is next used in the open position anterior to palpate the tissue. If the tissue anteriorly is bone, no further tissue is required for removal; this position is also roughly approximated by the anterior edge of the middle turbinate.

Besides being the entry into the anterior ethmoids, the bulla is important for locating the lamina papyracea. The lateral attachment of the bulla is on the lamina, and its identification can reduce the risk of orbital injury. It is important to use either Tru-cut forceps to avoid the stripping of normal mucosa, which will delay healing and cause scarring. Once the bulla is removed, it is important to define clearly the lamina papyracea and the basal lamella. Peribullar cells superiorly can also be removed at this point, clearly defining the anterior skull base and the frontal recess.

Postoperative follow-up

Intranasal packing is used routinely with Merocel sponges. Packs are removed on the first postoperative day. Patient is put on parentral antibiotics for 3 days and discharged on 2nd postoperative day, unless there is any complication. Antibiotics are used for 3 weeks. Either systemic or topical steroids are employed, depending on severity and nature of the disease. Patients are also given oral antihistamine therapy to reduce any allergic component of their disease, if applicable. The first postoperative visit is on 7th post-operative day. At this time, any cultures obtained are checked, and antibiotics are adjusted as needed. An endoscopic examination with debridement is performed to remove any debris, loose tissue or adhesions. At the second postoperative visit on 14th day, the patient is examined for the development of synechiae, which are opened at that time; stenting may be employed if there is risk of synechiae reformation. The third visit is on 1 month, when the mucosal status is reassessed, and inhaled nasal steroids are prescribed as indicated in the patients with sinonasal polyposis and nasal allergy. Follow- up thereafter is individualized for each patient. Post operatively all the patients were followed up for three months.

Results

Age of the patients participated in this study is from 13 years to 60 years. out of 50 patients, 30 were males (60%) and 20 were females (40%) (table 1).

Table 1: Gender wise distribution of patients according to age groups

Age group (yrs)	Males	Females	Total
13 – 20 years	4	2	6
21 – 30 years	13	8	21
31 – 40 years	7	5	12
41 -50 years	4	4	8
51 -60 years	2	1	3
Total	30	20	50

The extent of the surgery depends upon the extent of the disease pathology. 30% of the patients underwent anterior ethmoidectomy in addition to uncinectomy and middle meatal antrostomy. 30% of the patients underwent posterior ethmoidectomy also in addition to the above. 16% of the patients underwent frontal recess surgery in addition to uncinectomy, middle meatalantrostomy, anterior and posterior ethmoidectomy. 8% of the patients underwent sphenoidotomy in addition to uncinectomy, middle meatal antrostomy, anterior and posterior ethmoidectomy and 16% of the patients underwent uncinectomy, middle meatal antrostomy, anterior and posterior ethmoidectomy, frontal recess surgery and sphenodotomy. The incidence of major complication and minor complications was 2% & 12% respectively in this study (table 2).

Table 2: Endoscopic sinus surgery

Surgery	No of patients	Complications		Percentage
		Major	Minor	
MMA+AE	15	0	0	0%
MMA+AE+PE	15	0	1	6.6%
MMA+AE+PE+F	8	0	1	12.5%

MMA+AE+PE+S	4	0	1	25%
MMA+AE+PE+F+S	8	1	3	50%

Most of the complications occurred in the patients with extensive diseasepathology and paranasal sinus anatomical variations (table 3 & 4).

Table 3: Complications occurred in the patients with extensive disease pathology

Pathology	No of patients	Complications		Percentage
		Major	Minor	
Chronic Sinusitis	35	0	2	5.7%
Sinonasal Polyposis	15	1	4	33.33%

Table 4: Complications occurred in the patients with anatomic variations

Anatomical variations score	No of patients	Complications		
		Major	Minor	percentage
0	21	0	1	4.76
1-2	22	0	3	13.63
3-4	7	1	1	28.57

Discussion

The extent of the surgery depends upon the extent of the disease pathology. 30% of the patients underwent anterior ethmoidectomy in addition to uncinectomy and middle meatal antrostomy. 30% of the patients underwent posterior ethmoidectomy also in addition to the above. 16% of the patients underwent frontal recess surgery in addition to uncinectomy, middle meatal antrostomy, anterior and posterior ethmoidectomy. 8% of the patients underwent sphenoidotomy in addition to uncinectomy, middle meatal antrostomy, anterior and posterior ethmoidectomy and 16% of the patients underwent uncinectomy, middle meatal antrostomy, anterior and posterior ethmoidectomy, frontal recess surgery and sphenodotomy. We had one case of CSF rhinorrhoea, which is a major complication, and was managed surgically and the patient was discharged without any sequelae. This complication occurred in a case of bilateral extensive polyposis involving all the paranasal sinuses. The incidence of major complication is 2% in this study. The overall incidence of major complicationsin the study of May[8] was 1.2% and by Levine[9] was 0.85%. The overall average of incidence in internationally published studies is 1.1%. We didn't come across any major complications involving orbit in our study.

In the minor complications, we had 6 cases of minor complications; most of them are adhesions that occurred in 4 patients that come to 8%. All the cases were managed by release of adhesions under local anaesthesia, and carefulfrequent post-operative follow up. Most of the adhesions occurred in the cases ofextensive disease. We had one each case of periorbital ecchymosis and periorbitalemphysema, which was managed conservatively, and comes to 4% of minor orbital complications. Total minor complications rate in our study is 12%. The incidence of minor complications as reported by May[8] is 5.4% and by Levine[9] is 8%.

In the first U.S. study that quantified complications related to endoscopic sinus surgery, Stankiewicz[10], reported a 6% major and 13% minor complication rate, the most common being synechiae. In a follow-up study, Stankiewicz[10] reported on the complication rate of a subsequent group of 90 patients, and noted a rate of 2.4%, which compared favorably with previous reports of complications as reported by Freedman and Kern in 1979[11] using conventional intranasal methods. This significant drop in the complication rate was attributed to greater operative experience, concurrent cadaveric dissection, and the use of limited ethmoidectomy initially, with gradual progression to more extensive procedures. Dessi et al[12] noted a 1.2% complication rate for overall complications. The complications both major and minor in this study are comparable to the international standards.

Conclusion

We concluded that with successful endoscopic sinus surgery, a clear understanding of anatomy is essential. Knowledge of anatomic relationships and diversity helps surgeons avoid complications. By applying the anatomic knowledge of the surgical procedure carefully, one can increase the safety of patients. The basic tenets of endoscopic sinus surgery can be used in a variety of confident patients.

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