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Original Article

To assess the risks of various endoscopic sinus surgery complications in patients under general anaesthesia

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ABSTRACT:
Aim: To assess the risks of various endoscopic sinus surgery complications in patients under general anaesthesia **Materials & methods:** Endoscopic sinus surgery was performed on patients who had chronic sinusitis or sinonasal polyposis, had not responded to intensive medical management for at least six months, and had supportive findings from diagnostic nasal endoscopy and radiology. Every patient was given a comprehensive examination of their ears, nose, and throat (ENT). All of the patients had a diagnostic procedure called nasal endoscopy. Patients were given radiological tests such as X-rays of the paranasal sinuses and computed tomography scans of the paranasal sinuses if there were abnormalities that were indicative of sinusitis or osteomeatal complex illness. **Results:** Most of the complications occurred in the patients with extensive diseasepathology and paranasal sinus anatomical variations. In addition to having an uncinectomy and a middle meatal antrostomy performed, an anterior ethmoidectomy was performed on 31% of the patients. In addition to the procedures described above, a posterior ethmoidectomy was performed on 31% of the patients. In addition to uncinectomy, middle meatalantrostomy, and anterior and posterior ethmoidectomy, frontal recess surgery was performed on 15% of the patients. 15% of the patients had frontal recess surgery in addition to uncinectomy, middle meatal antrostomy, anterior and posterior ethmoidectomy, and sphenodotomy. 8% of the patients underwent sphenoidotomy in addition to uncinectomy, and 8% of the patients underwent sphenodotomy in addition to uncinectomy, middle meatal antrostomy, anterior and posterior ethmoid During the scope of this research, the incidence of significant complications was 3%, while the incidence of mild complications was 13%. **Conclusion:** We came to the conclusion that having a solid knowledge of anatomy is very necessary for endoscopic sinus surgery to be effective. Surgeons may prevent difficulties more easily if they have a thorough understanding of anatomical linkages and variation.
Keywords: Endoscopic Sinus Surgery, Complications, Nasal Endoscopy, Chronic Sinusitis

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INTRODUCTION

The diagnosis and treatment of nasal congestion and paranasal sinuses have been profoundly impacted by the introduction of the nasal endoscope. Endoscopic sinus surgery has now reached the level of standard medical therapy for patients who suffer from chronic and recurrent sinusitis. It is the most exciting new advancement in the area of otorhinolaryngology that has occurred in recent times. When we are at work, we have the chance for enhanced illumination and improved vision, both of which may be achieved with minimally invasive surgery. It is also possible for the endoscope to enhance postoperative performance management, which in turn helps to allow a speedier recovery and the early diagnosis of any infections that may reappear.

As a result of the work of Stammberger[1, Messerklinger[2, Wigand[3, and Kennedy and colleagues[4,5], there was a paradigm change in the way nasal surgery is thought about and managed. The patient has benefited from the ability to use endoscopy of the nose to diagnose sinus and internal pathology in the lower extremities and edges of the nose, as well as from the delicate treatment of the disease, which has resulted in more precise surgery, the preservation of functional capacity, and quicker recovery. Endoscopic sinus surgery has been around for quite some time, but new ideas on how it should be performed are coming up thanks to advancements in anatomical knowledge, endoscopes and video equipment, new tools, and technological advances.

The objective of endoscopic surgery is to preserve both the anatomic and functional integrity of the body. The scope of the operation is scaled differently for each individual circumstance. The osteoma issue in the middle meatus and the ethmoidal cells are the primary focus of this treatment. The prospect of regenerating the sinus drainage and mucosal repair is

brought to the attention of potential patients via the usage of the term functional endoscopic sinus surgery (FESS). Sinus surgery involves a lot of potential risks associated with it because to the particular character of the factors as well as their near proximity to the orbit, the anterior cranial fossa, and the vascular systems. [6].

Excellent insight into the most recent advancements in endoscopic technology, as well as detailed preoperative and intra operative analysis of complex anatomy using advanced radiographic Computed Tomography scan technology, Magnetic Resonance Imaging scanner technology, and imaging systems that help reduce the risk of potential complications. The level of expertise and acquaintance with endoscopic anatomy and its variability possessed by the surgeon is an extremely important factor in the severity reduction process [7]. As long as the FESS procedure is carried out with the utmost accuracy and caution, it is possible to get consistently positive findings from it. This study's objective was to investigate the myriad of potential risks associated with endoscopic sinus surgery.

MATERIALS & METHODS

The research was a prospective study that was carried out on one hundred individuals who were seen at the ENT outpatient department.

INCLUSION CRITERIA

- Endoscopic sinus surgery was performed on patients who had chronic sinusitis or sinonasal polyposis, had not responded to intensive medical management for at least six months, and had supportive findings from diagnostic nasal endoscopy and radiology.
- Patients met these criteria to be eligible for the procedure.
- Age group more than 14 years old and less than 60 years old

EXCLUSION CRITERIA

- Disorders such as lesions of the pituitary, orbit, and lacrimal apparatus, as well as intracranial complications of sinusitis and neoplasms, are examples of pathologies.
- When there is a gross deviation of the septum, endoscopic sinus surgery cannot be done without first correcting the septal deviation.
- People that are suffering from a systemic ailment.

METHODOLOGY

We got a comprehensive history of complaints, including the length of time they had been occurring. It was necessary to gather a prior medical and surgical history. Every patient was given a comprehensive examination of their ears, nose, and throat (ENT). All of the patients had a diagnostic procedure called nasal endoscopy. Patients were given radiological tests such as X-rays of the paranasal sinuses and computed tomography scans of the paranasal sinuses if there were abnormalities that were indicative of sinusitis or osteomeatal complex illness.

SURGICAL TECHNIQUE

The operation is carried out when the patient is under the influence of general hypotensive anaesthesia. Instead of doing a reverse Trendelburg, a little elevation of 15 degrees was made to the patient's head at the conclusion of the procedure. A moist cotton swab that has been soaked in 4% lignocaine containing oxymetazoline and kept in place for ten minutes is used to constrict the nostrils and keep them in place. This is done by inserting the swab into the inferior meatus and the middle meatus. The packing of the throat is finished.

It is essential to eliminate the uncinate process in its entirety, beginning at the top attachment and proceeding downward to the bottom cover of the maxillary antrum. A 1% lignocaine injection that contains 1 / 100,000 adrenaline has to be administered ten minutes before the incision is made. A pair of scissors knives are used to enter the internal attachment that is required for the uncinate procedure. With Tru-cut forceps, a significant portion of the bottom attachment was severed. In order to expose the hiatus semilunaris in its entirety, the remaining remnants of the uncinate bone are removed. This exposes the hiatus semilunaris from the anterior region all the way to the ostium of the antrum. In cases when the bulla ethmoidalis does not undergo any changes, the front attachment is often the base of the skull, which also serves as the posterior border of the frontal recess. It is possible to employ the frontal recess probes as a separator in order to extract polyps and polypoid variables from the recess in order to eliminate them. This arrangement may be further validated by transillumination of the frontal sinus using an endoscope that is put into the recess or by using image-guidance technology. Both of these techniques are available.

The antrum probe is used to examine the ostium as the initial step. In the event that it is found that a bigger ostium is required, the straight endoscopic scissors will be introduced and used to make an incision posteriorly. After that, the backbiting forceps are put in the open position anteriorly so that the tissue may be palpated with them. In the event when the tissue located anteriorly is bone, then there is no need to remove any further tissue; this location is also generally approached by the anterior margin of the middle turbinate.

In addition to serving as the portal into the anterior ethmoids, the bulla is an essential component in determining the precise location of the lamina papyracea. It is important to recognise where the lateral attachment of the bulla is located on the lamina in order to lower the probability of sustaining an injury to the orbit. It is essential to make use of either Tru-cut forceps in order to prevent the stripping of

normal mucosa, which would both slow down the healing process and lead to scarring. When the bulla has been removed, it is essential to make a distinct distinction between the basal lamella and the lamina papyracea. At this stage, you may also eliminate the peribullar cells that are located superiorly, which will help clearly define the anterior skull base and the frontal recess.

POSTOPERATIVE FOLLOW-UP

Merocel sponges are often used in intranasal packing procedures. On the first postoperative day, the packs are extracted from the patient. In the absence of any complications, the patient is given parenteral antibiotics for a period of three days before being released on the second postoperative day. Antimicrobial treatment lasts for a total of three weeks. Systemic or topical steroid treatment may be used, depending on the severity and profile of the ailment being treated. Patients may also get antihistamines in pill form to help treat any allergy symptoms that may be accompanying their condition, if appropriate. The 7th postoperative day is when the patient will have their first postoperative visit. At this point, any cultures that were acquired are examined, and any necessary adjustments to the antibiotic treatment are made. After performing an endoscopic inspection and debridement, any debris, loose tissue, or adhesions that may be present are removed. The patient is inspected for the development of synechiae during the second postoperative visit on the 14th day, which are opened at that time; stenting may be performed if there is danger of synechiae reformation. Patients who have sinonasal polyposis and nasal allergy are given a prescription for inhaled nasal steroids during the third appointment, which takes place one month later. At this session, the mucosal status is appraised, and the patient may get these medications. After that, the subsequent care is tailored according to the needs of each patient. After surgery, every patient was monitored for a period of three months before being discharged.

RESULTS

Patients ranging in age from 13 to 60 years old took part in this research project, and their ages are shown below. 65 of the 100 patients were male, making up 66% of the total, and 35 were female, making up 35%. (table 1).

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

Age group (yrs)	Males	Females	Total
below 20 years	13	1	14
20 – 30 years	28	12	40
30 – 40 years	15	10	25
40 -50 years	6	9	15
above 50	3	3	6
Total	65	35	100

The severity of the disease pathology will determine how extensive the surgical procedure will be. In addition to having an uncinectomy and a middle meatal antrostomy performed, an anterior ethmoidectomy was performed on 31% of the patients. In addition to the procedures described above, a posterior ethmoidectomy was performed on 31% of the patients. In addition to uncinectomy, middle meatalantrostomy, and anterior and posterior ethmoidectomy, frontal recess surgery was performed on 15% of the patients. 15% of the patients had frontal recess surgery in addition to uncinectomy, middle meatal antrostomy, anterior and posterior ethmoidectomy, and sphenodotomy. 8% of the patients underwent sphenoidotomy in addition to uncinectomy, and 8% of the patients underwent sphenodotomy in addition to uncinectomy, middle meatal antrostomy, anterior and posterior ethmoid During the scope of this research, the incidence of significant complications was 3%, while the incidence of mild complications was 13%. (table 2).

Table 2: Endoscopic sinus surgery

Surgery	No of patients	Complications	
		Major	Minor
MMA+AE	31	0	0
MMA+AE+PE	31	0	2
MMA+AE+PE+F	15	0	2
MMA+AE+PE+S	8	0	2
MMA+AE+PE+F+S	15	3	7

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	71	0	5	7.0%
Sinonasal Polyposis	29	3	9	24.38%

Table 4: Complications occurred in the patients with anatomic variations

Anatomical variations score	No of patients	Complications		
		Major	Minor	percentage
0	41	0	3	7.3
1-2	45	0	7	15.56
3-4	14	3	3	42.86

DISCUSSION

The severity of the disease pathology will determine how extensive the surgical procedure will be. In addition to having an uncinectomy and a middle meatal antrostomy performed, an anterior ethmoidectomy was performed on 31% of the patients. In addition to the procedures described above, a posterior ethmoidectomy was performed on 31% of the patients. In addition to uncinectomy, middle meatal antrostomy, and anterior and posterior ethmoidectomy, frontal recess surgery was performed on 15% of the patients. 15% of the patients had frontal recess surgery in addition to uncinectomy, middle meatal antrostomy, anterior and posterior ethmoidectomy, and sphenodotomy. 8% of the patients underwent sphenoidotomy in addition to uncinectomy, and 8% of the patients underwent sphenodotomy in addition to uncinectomy, middle meatal antrostomy, anterior and posterior ethmoid We had one patient who had CSF rhinorrhoea, which is a serious complication. This case was surgically handled, and the patient did not have any sequelae after being released. This problem manifested up in a patient who had bilateral severe polyposis that affected all of the paranasal sinuses. In this particular research, the incidence of serious complications was found to be 3%. May's research [8] found that the total incidence of significant problems was 1.2%, whereas Levine's study [9] found that it was 0.85%. In research conducted all across the world and published in academic journals, the total average incidence rate is 1.1%. Throughout the course of our research, we did not come across any significant difficulties connected to orbit.

We had 13 occurrences of minor problems, the majority of which were adhesions, which occurred in 7 patients and account for 14% of the total number of minor complications. Every one of the instances was successfully treated by releasing the adhesions while the patient was under local anaesthesia, followed by careful and regular post-operative follow up. The instances with significant illness accounted for the majority of adhesions that were seen. We had two cases each of periorbital ecchymosis and periorbitalemphysema, both of which were treated with a cautious approach. This accounts for 4% of the mild problems that might occur with orbital surgery. The overall risk of mild problems was 13% in our research. According to May[8], the rate of mild problems is 5.4%, but Levine9 reports that the incidence is 8%.

Stankiewicz[10] conducted the first research in the United States to quantify the risks associated with endoscopic sinus surgery. They found a 6% major complication rate and a 13% minor complication rate, with synechiae being the most prevalent risk. Stankiewicz[10] reported on the complication rate of a subsequent group of 90 patients, and noted a rate of 2.4%. This rate compared favourably with previous reports of complications as reported by Freedman and Kern in 1979[11] using conventional intranasal methods. In the follow-up study, Stankiewicz[10] reported on the complication rate of a subsequent group of 90 patients, and noted a rate of 2.4%. More operating expertise, concomitant cadaveric dissection, and the use of restricted ethmoidectomy initially, with progressive development to more comprehensive operations were all factors that contributed to this dramatic decline in the complication rate, which was linked to the fact that. In their study, Dessi et al. [12] found that the total complication rate was just 1.2%. The main and minor issues that were found in this research are on par with those seen in other worldwide studies.

CONCLUSION

We came to the conclusion that having a solid knowledge of anatomy is very necessary for endoscopic sinus surgery to be effective. Surgeons may prevent difficulties more easily if they have a thorough understanding of anatomical linkages and variation. By utilising the anatomic knowledge of the surgical operation attentively, one may enhance the safety of patients. The fundamental principles of endoscopic sinus surgery may be successfully applied to a wide range of self-assured individuals.

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