



“IMPORTANCE OF LATERAL RHINOTOMY APPROACH FOR REMOVAL OF INTRANASAL TUMORS IN CONTEXT OF MODERN RHINOLOGICAL SURGERIES.”

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ABSTRACT

AIM AND OBJECTIVE: a) To evaluate the cases that underwent lateral rhinotomy approach for removal of tumors. b) To analyze the advantages and disadvantages of lateral rhinotomy approach in context to modern surgical approaches like endoscopic surgery.

MATERIALS AND METHODS: Patients who had undergone lateral rhinotomy approach and other alternative approaches for intranasal tumor removal at Department of Otorhinolaryngology and Head and Neck Surgery, Gauhati Medical College and Hospital (GMCH), Assam, India were included, data collected and analyzed from August 2019 to July 2020.

RESULTS: A total of 24 cases operated for intranasal tumors by different approaches. Out of total 24 cases 14 (58.3 %) cases were operated by lateral rhinotomy approach and 10 cases (41.7%) by endoscopic approaches. Gender ratio in lateral rhinotomy group was 3.7:1 (M:F). Minimum and maximum age of patient in lateral rhinotomy approach was 6 and 70 years respectively. In lateral rhinotomy group, 50% cases were operated for inverted papilloma. All the cases of lateral rhinotomy developed oedema of eyelids, 78.6% developed epiphora, 42.8% paresthesia of ipsilateral cheek and significant hemorrhage are noted in 3 cases (21.4%) in immediate postoperative period. Scar was common disadvantage of all the cases of lateral rhinotomy. There was no major immediate postoperative complication of endoscopic procedures except few minor ailments.

KEYWORDS

lateral rhinotomy, Intranasal tumor, endoscopic approach

INTRODUCTION:

The lateral rhinotomy operation is attributed to E.J. Moure from Bordeaux who first described it in 1902 for removal of frontoethmoidal tumors.¹ However, according to declaration made by Michaux and Bruns, they described the similar procedure in 1848 and 1872 respectively.² Incision for lateral rhinotomy lies halfway between the medial canthus and the nasal dorsum extending from the inner margin of the eyebrow down along the nasomaxillary groove curving around the ala round to finish in the nasal cavity. It is possible to limit or extend the incision with some extend depending on the size and extent of the tumor. Adequate exposure and complete tumor removal is the primary objective of lateral rhinotomy approach for intranasal or paranasal sinuses tumors. This operation is still performed by otolaryngologists for adequate removal of intranasal tumors with disease free margin, which may not always be possible by other modern conservative endoscopic procedures. Aesthetic deformity due to scar at the site of incision is one of major disadvantages of this approach and preferably avoided in younger generations. High rate of recurrence due to residual tumor tissue or positive margin resulting from conservative approaches such as endoscopic procedures can be avoided by excellent exposure from lateral rhinotomy. On the other hand, endoscopic procedures can be employed for non-massively enlarged intranasal tumors with acceptable recurrence rate and better cosmetic results.

The procedure of lateral rhinotomy is valuable for malignancy confined to nasal cavity, e.g. malignant melanoma and benign neoplasm arising within nasal cavity, medial maxilla, ethmoids, pterygomaxillary region and nasopharynx, e.g. angiofibroma, inverted papilloma, osteoma, ossifying fibroma and neurofibroma.^{4,5} Apart from intranasal tumors, for extensive tumors involving the ethmoid labyrinth and maxillary sinus, a direct, open approach via lateral rhinotomy offers uncompromised surgical exposure for complete tumor resection. Small tumours isolated to the middle meatus, or anterior ethmoid sinus can be managed successfully via an endonasal approach.⁶

AIM AND OBJECTIVE:

- To evaluate the cases that underwent lateral rhinotomy approach for removal of tumors.
- To analyze the advantages and disadvantages of lateral rhinotomy approach in context to modern surgical approaches like endoscopic surgery.

MATERIALS AND METHODS:

The present study was conducted at Department of Otorhinolaryngology and Head and Neck Surgery, Gauhati Medical College and Hospital (GMCH), Guwahati, Assam, India. Permission was obtained from Ethical Clearance Committee, GMCH for conduct of this study and use of hospital data. Particulars like name, age, gender distribution and clinical features at the time of presentation, and preoperative diagnosis of all the cases that had undergone lateral rhinotomy approach and other alternative approaches for intranasal tumor removal at the department from August 2019 to July 2020 were collected and analyzed. Both preoperative and postoperative data were recorded and analyzed. All the patients have gone through all required routine preoperative investigations including CT scan of nose and paranasal sinuses and nasal endoscopy. Preoperative (not all cases) and postoperative biopsy (all cases) were done for histopathological confirmation of tumors. Data regarding preoperative diagnosis, results of operation, complications, advantages and disadvantages of all the cases who undergone lateral rhinotomy and endoscopic approaches for intranasal tumors were collected and analyzed.

RESULTS:

To mention that in the present study total number of cases is less than expected due to COVID-19 pandemic and lockdown for several months during the period of study. Patients from remote areas could not attend due to travel restrictions and Covid-19 protocols. In the present study a total of 24 cases operated for intranasal tumors by different approaches. Out of total 24 cases 14 (58.3 %) cases were operated by lateral rhinotomy approach and 10 cases (41.7%) by endoscopic approaches. In the present study there were 17 male and 7 female cases with male female ratio of 2.4:1. Gender distribution in lateral rhinotomy group was 11 male and 3 Female with male female ratio 3.7:1. Minimum age of patient who underwent lateral rhinotomy was a 6 years boy who was operated for Juvenile ossifying fibroma of nose and maximum age was 70 years, with mean age 46.4. Nasal obstruction was the most common symptom at first presentation in 18 cases followed by epistaxis as second most common complaint in 13 Cases. Rhinorrhea in the form of purulent or mucopurulent was present in 10 cases and headache in 8 cases. Age distribution of patients were categorized into three groups 0 – 20 years, 20 – 40 years and 40 – 60 years and above 60 years of age. It was observed that major number (8 cases) of lateral rhinotomy cases between 40 to 60 years of age and in endoscopic approach majority below 40 years of age (7 cases). Apart

from routine and radiological investigations all the cases undergone preoperative diagnostic nasal endoscopy. Preoperative biopsy was done in selected cases considering the risk of profuse bleeding. Out of 14 cases of lateral rhinotomy, 7 cases were operated for inverted papilloma as preoperative diagnosis, while 3 cases of nasal hemangiomas polyp, 2 cases of nasopharyngeal angiofibroma, one case of juvenile ossifying fibroma and one case of allergic polyp with tubercular granuloma were operated. On the other hand, endoscopic procedures were carried out in 10 cases, which included 7 cases of nasal/septal hemangioma and nasal papilloma 3 cases. Significant intraoperative bleeding was observed in majority of cases (7 cases) performed by lateral rhinotomy. Immediate postoperative period was uneventful in all the cases of endoscopic procedures except few minor ailments like pain and minimal nasal bleeding, but all the cases of lateral rhinotomy developed oedema of varying degree of eyelids in immediate postoperative period, 11 cases developed epiphora, 6 cases paraesthesia of ipsilateral cheek and postoperative hemorrhage were noted in 4 cases. Postoperative oedema of eyelids and epiphora got significantly disappeared within first seven to ten postoperative days with anti-inflammatory and decongestant medications. Cosmetic deformity due to incisional scar was seen as most common complication for all the cases (100%) of lateral rhinotomy.

Table 1: Intranasal Tumors And Approaches Made For Tumor Removal

Diagnosis	Surgical Approach	Number of cases
Inverted papilloma	Lateral rhinotomy	7
Nasal hemangiomas polyp	do	3
Nasopharyngeal angiofibroma	do	2
Juvenile ossifying fibroma	do	1
Allergic polyp with tubercular granuloma	do	1
Septal/nasal hemangioma	Endoscopic approach	7
Nasal/septal papilloma	do	3

Table 2: Postoperative Complications Of Lateral Rhinotomy

Complications	Number of cases	percentage
Significant Haemorrhage	3	21.4%
Oedema of eyelids	14	100%
Paraesthesia of cheek	6	42.8%
Epiphora	11	78.6%
Aesthetic deformity (Scar)	14	100%

DISCUSSION:

The present study was conducted on total 24 cases who undergone lateral rhinotomy approach and Endoscopic approaches for removal of intranasal tumors, depending on preoperative evaluation and diagnosis. We had followed different guidelines and restrictions of Covid-19 for several months within our study period and number of cases attending our hospital was less than expected due to lockdown and travel restrictions. Out of total 24 cases, 17 cases are male and 7 cases female, with male female ratio 2.4:1. 14 cases (58.3%) were operated by lateral rhinotomy approach for tumor removal. There were 11 male cases and 3 female cases operated by lateral rhinotomy approach with male female ratio 3.7:1. This indicates, large and extensive tumors requiring lateral rhinotomy were more common in male comparison to female. In our study age range of patients was between 6 years to 70 years. K R Iseh (2006) performed thirty-eight lateral rhinotomies in 30 patients between 6 – 65 years of age, and 19 males and 11 females with a male to female ratio of 1.7:1.⁷ In our study, two children of ages 6 and 12 years were operated by lateral rhinotomy for the resection of juvenile ossifying fibroma and nasal mass with vestibular stenosis respectively. Lateral rhinotomy could not be avoided in these two cases as tumor visualization was not clear and adequate for endoscopic approach.

It has been observed that majority of cases presented lately and extensive involvement of nose and PNS already been there at time of attending our institute. Out of 14 cases of lateral rhinotomy, 7 cases (50%) were operated for inverted papilloma as preoperative diagnosis, including 3 cases (21.4%) of nasal hemangiomas polyp, 2 cases (14.3%) nasopharyngeal angiofibroma, one case (7.14%) of juvenile ossifying fibroma and one case (7.14%) of allergic polyp with tubercular nasal granuloma (postoperative diagnosis). All the cases of inverted papilloma were operated by lateral rhinotomy approach for better exposure and complete tumor removal despite disadvantage of incisional scar. For K R Iseh (2006) also the main indications for surgery were nasal mass causing nasal obstruction in 37 surgeries

(97.2%) while one (2.8%) was due to penetrating arrow head injury of the orbit and infratemporal fossa.⁷ Hua-Lin Wang et al (2007) in their study on management of sinonasal inverted papilloma in 86 cases used Lateral Rhinotomy approach in 63 cases.⁸ Whereas, Xiao-Wei Liu et al (2012) in their study on role of endoscopy for nasal inverted papilloma on 72 cases, 56 (978%) cases were operated endoscopically and 10 (14%) cases by lateral rhinotomy approach, 5 cases (7%) endoscopically and cold well luc combined, and one case with partial resection of maxilla. In his study lateral rhinotomy was carried out at T2 (4 cases), T3 (5 cases), and T4 (1 case) stages of Inverted papilloma according to Krouse's classification.⁹ In our study endoscopic procedures were carried out in 17 cases, that included 11 cases of nasal/septal hemangioma and nasal papilloma 6 cases. According to Kraft et al. (2003) the indication of lateral rhinotomy and endoscopic is different. The surgical approach should be according to the position and the range of the lesion. If the lesion access to nasal cavity, maxillary, ethmoid and sphenoid sinus, it is better to choose the endoscopic approach; if the lesion access to lacrimal sac, nasofrontal duct and the fossa orbitalis, it is better to choose the lateral rhinotomy.¹⁰

In the present study, there was no major immediate postoperative complications in all the cases of endoscopic procedures except few minor ailments like pain and minimal nasal bleeding, but all the cases (100%) of lateral rhinotomy developed oedema of eyelids, 11 cases (78.6%) developed epiphora, 6 cases (42.8%) paraesthesia of ipsilateral cheek and significant hemorrhage are noted in 3 cases (21.4%) with vascular tumors in immediate postoperative period. Cosmetic deformity in the form of scar was common disadvantage of all the cases (100%) of lateral rhinotomy. VJ Lund in his literature described complications of lateral rhinotomy under the headings of early and late complications. Early complications include haemorrhage, blepharitis and oedema of the lids, paraesthesia due to infraorbital nerve damage, wound infection. CSF leak and meningitis. Late complications may be epiphora due nasolacrimal duct injury, cosmetic deformity, diplopia due to incision extended superiorly to affect trochlea, telecanthus if medial canthal ligament is not reapproximated, obstruction of frontonasal recess leading to subsequent mucocele formation and nasocutaneous fistula may be a rare complication of postradiotherapy patients.¹ Recurrent or persistent epiphora can be prevented by carrying out a dacrocystorhinostomy to prevent stenosis of the nasolacrimal duct, when the lateral nasal wall is partially or completely removed and more chances of nasolacrimal duct injury.⁷

For lateral rhinotomy approach we selected large, extensive and vascular intranasal tumors with chance of incomplete tumor removal by endoscopy. Complete removal of tumor was achieved in all the cases without any residual disease or recurrence during the study period. J Wong et al (1986) in their study reviewed 22 cases of lateral rhinotomy for intranasal tumors and found lateral rhinotomy as safe, repeatable and cosmetically sound procedure that provides excellent surgical approach to nasal cavity and sinuses.¹¹ In contrast, Hua-Lin Wang et al (2007) observed endoscopic procedures provide excellent visualization, preservation of vital anatomic structures and no facial scar in contest to lateral rhinotomy with postoperative facial scar or deformity. They found recurrence in lateral rhinotomy group 9.5% and in endoscopy is 13%.⁸ Wider surgical excision of the lesion including medial maxillectomy, ethmoidectomy, exposure of the cribriform plate, frontal sinus, sphenoidal sinus, maxillary antrum and access to the pterygopalatine fossa can be accomplished through the same incision, with modifications and extensions in lateral rhinotomy approach.¹²

Lateral rhinotomy allows visualization of the site of origin, the extent of spread of disease to other contiguous region and excision of the tumor with adequate margins. However, there will be a scar on the face. In contrast, the endoscopic surgery may be beneficial in the nasosinusal papilloma surgery exclusively or in combination with the external access. It has many advantages: i) It allows better visualization of tumor extension and its insertion, ii) It is less invasive, less bleeding and is necessary to persist structure and function of nasal cavity, allowing for better healing with decreased morbidity and shorter recovery periods.⁹ Careful selection of cases before operation is very crucial to avoid incomplete tumor removal by endoscopic procedure and unnecessary incisional facial scar of lateral rhinotomy.

Except some amount crusting and nasal mucosal edema, we did not find any case with affect on nasal airway function after lateral rhinotomy and endoscopic approaches at the time of discharge from

hospital and during follow up. Study conducted by Edgar A. et al (2009) on the impact of lateral rhinotomy and medial maxillectomy on nasal airway function on 21 cases, also observed lateral rhinotomy and medial maxillectomy does not adversely affect nasal air way function.¹³ With the progress in the endonasal endoscopic surgical technique, there has been much debate regarding possible benefits of such surgical approach over traditional ones such as lateral rhinotomy, degloving and sublabial approach.¹⁴ Both the approaches have advantages and disadvantages depending on clinical status of the patient and extension of disease. Mikio Suzuki et al (2005) did endoscopic en block resection of 23 benign and 4 low grade malignant (limited to nasal cavity) intranasal tumors with zero recurrence up to 21 months postoperatively.¹⁵ As our study period was of short duration, we could not comment on any recurrence of disease among our operated patients.

CONCLUSION:

Despite the development of modern endoscopic conservative approaches for removal of intranasal tumors and disadvantages of lateral rhinotomy from cosmetic point of view, ENT and Head & Neck surgeons still have to perform this approach for some intranasal diseases. Better exposure and adequate disease removal are the main advantages of lateral rhinotomy for intranasal vascular tumors and tumors extending to nearby structures. Limitation of our study are small sample size due to Covid-19 pandemic and short duration of study to comment on recurrence of tumor.

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