

A Case Series of Total Maxillectomy by Midface Degloving Approach

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Abstract

Background: The midface degloving approach allows for wide exposure of the maxilla and surrounding midfacial structures with intranasal and intraoral incisions, and is free of external facial incisions. It has been used in a variety of benign and sinonasal lesions but its use in total maxillectomy is relatively rare. This case series assessed the clinical usefulness and feasibility of midface degloving approach for total maxillectomy, and outlined the perioperative and postoperative outcomes. **Material and Methods:** This study is a retrospective case series, which was carried out in the Department of Otorhinolaryngology, Government General Hospital, Ananthapuramu, from October 2023 upto September 2025. Purposive sampling was used in which 8 patients who had total maxillectomy for various maxillary pathologies were included. All patients were clinically examined, a diagnostic nasal endoscopy was performed and a pre-operative computed tomography (CT) of the nose and paranasal sinuses was done. Operative parameters and postoperative complications, functional results, cosmetic results and follow-up findings were recorded. Descriptive statistics of IBM SPSS Statistics 29.0 were used for data analysis. **Results:** Among the eight patients, five (62.5%) were males and three (37.5%) were females, with ages ranging from 19 to 67 years. Osteomyelitis of maxilla was the most common in five (62.5%) patients followed by carcinoma of maxilla in two (25.0%) patients and fibrous dysplasia in one (12.5%) patient. Most of the patients were in the age group of 46-60 years (62.5%). The postoperative follow-up period varied between 8 and 23 months. **Conclusion:** The midface degloving approach allows for wide surgical access for a select patient undergoing total maxillectomy without external facial incisions and visible facial scars. It can be used in a wide variety of inflammatory, malignant and benign maxillary diseases, which shows its versatility. More extensive prospective comparative trials are needed to prove its efficacy and long-term results.

Keywords: Midface degloving, Total maxillectomy, Maxillary pathology, Sinonasal surgery, Facial aesthetics.

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INTRODUCTION

Maxillary lesions include a wide range of benign, locally aggressive, inflammatory and malignant conditions, which may need extensive surgical resection if there is significant involvement of the maxillary antrum, nasal cavity, palate or neighbouring midfacial structures.^[1] Total maxillectomy is the definitive therapy for the removal of extensive disease, however proper surgical exposure is required for the accurate osteotomies as well as complete removal of pathological tissue and preservation of important adjacent structures, when oncologically and technically possible.^[2] The surgical approach thus plays an important role in the surgical access, postoperative morbidity and cosmetic outcome. Lateral rhinotomy and the Weber–Fergusson incision and its variants have been used traditionally for extensive maxillary surgery.^[3] While these methods give adequate exposure of the maxilla and surrounding areas, external facial incisions can lead to scarring, changes in facial shape, and wound healing issues.^[4] Moreover, some of the traditional methods offer mainly unilateral exposure and might need further modification in case of superior and lateral extension of the lesion.^[5] These restrictions have stimulated the evolution and use of techniques that allow for equivalent surgical access without incisions on the outside the face. Midface degloving offers excellent access to the midfacial

skeleton with a combination of an intranasal and intraoral approach that avoids an external facial scar.^[6] The technique permits access to the midfacial structures, zygomatic region, infraorbital rim, nasal cavity, and maxilla whilst maintaining the external facial architecture.^[7] Casson et al. described the versatility of this approach and it was later modified and popularized for multiple maxillary and sinonasal lesions.^[8,9] It has been used for benign and locally aggressive diseases like fibrous dysplasia, cysts and tumors, and some malignant lesions.^[5,10] The previous reports have highlighted its potential benefits such as wide surgical exposure, good cosmetic outcome, low external wound morbidity, and relatively simple postoperative recovery.^[8,10] Despite these benefits, midface degloving for total maxillectomy is still not widely used, and there are few published clinical

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experiences, especially regarding systematic evaluation of the feasibility of the surgery and the postoperative results. Another anatomical restriction is for lesions that are beyond the reach of adequate degloving, such as extensive zygomatic arch, superior orbital, and infraorbital involvement. Thus careful patient selection, exposure, complications, functional recovery and cosmetics is important. The purpose of the present study was to evaluate the usefulness and feasibility of midface degloving approach for total maxillectomy and to illustrate the intra-operative, post-operative, functional and cosmetic results in patients undergoing total maxillectomy by the midface degloving approach for various maxillary pathologies.

MATERIALS AND METHODS

The retrospective case series was carried out in the Department of Otorhinolaryngology, Government General Hospital, Ananthapuramu, for 2 years from October 2023 till September 2025. The patients were selected using purposive sampling, a total of 8 patients who underwent total maxillectomy using the midface degloving approach for various maxillary and sinonasal pathologies were included. Patients who had undergone the surgical procedure mentioned above and had sufficient postoperative clinical records and follow-up data were included. Those patients who had incomplete medical records or who lacked operative details were excluded from the analysis. Appropriate demographic and clinical data was obtained from the hospital records.

A thorough clinical examination was performed in all patients: history, general examination, external examination of the face, oral cavity examination and full examination of the ear, nose and throat (ENT) with diagnostic nasal endoscopy. Pre-operative Computed tomography (CT) of nose and paranasal sinuses was done to evaluate the extent and location of the lesion and to plan surgery. The diagnosis and disease extent were recorded and the surgical feasibility of the midface degloving approach for adequate surgical exposure and complete resection were evaluated. Intra-operative variables such as surgical time, estimated blood loss, surgical exposure and intra-operative complications were taken from the operative notes.

Midface degloving was done with intranasal and intraoral incisions without any external facial incision. A complete transfixion incision was performed through the nasal vestibule, down to the nasal floor and laterally to the pyriform aperture. Soft tissues were raised off the cartilaginous and bony nasal dorsum in a plane superficial to the periosteum. A unilateral gingivolabial sulcus incision was then performed and the nasal spine was skeletonized, and the nasal floor incision was connected. A vertical incision was made in the mucous membrane of the hard palate from the central incisors junction to the hard/soft palate junction, then laterally towards the maxillary tuberosity. The osteotomies were then made depending on the extent of the resection, anterior to the zygomatic eminence, inferior to the infraorbital rim, along the frontal process of the maxilla, through the palate, and at the

maxillary tuberosity to separate the specimen from the pterygoid plates. Osteotomy lines were finished and the maxillary specimen was removed.

Post operative outcomes were evaluated from hospital records and follow-up visits. Patients were assessed at 1 week, 1 month and 3 months after surgery was recorded as per the available clinical records. The total follow-up period varied from 8-23 months. Follow-up parameters evaluated were wound healing, infection, wound dehiscence, nasal crusting, nasal synechiae, residual or recurrent disease (in malignant cases) and cosmetic outcome (external facial scarring). Functional results such as hypernasality, nasal regurgitation, prosthesis tolerance, airway patency, epiphora, infraorbital numbness and facial paraesthesia were also documented. Postoperative recovery and the duration of hospital stay were recorded.

Data was coded and entered in Microsoft Excel and exported for analysis in IBM SPSS Statistics version 29.0. Demographic, clinical, operative and postoperative characteristics of the patients were summarized using descriptive statistics.

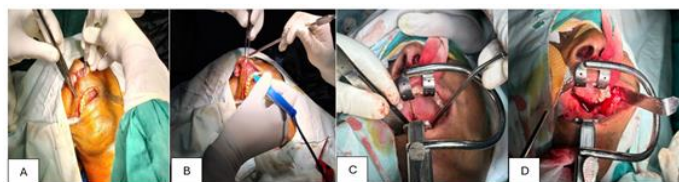


Figure: A. Complete transfixion incision extending laterally upto pyriform aperture; B. Gingivolabial sulcus incision; C. Vertical incision from central incisors to junction of hard and soft palate; D. Mucosal incision extending upto maxillary tuberosity



Figure 2: Postoperative specimen after total maxillectomy

RESULTS

The age distribution showed that the majority of patients were in the 46–60-year age group (5/8; 62.5%), followed by the 61–70-year age group (2/8; 25.0%) and the 15–30-year age group (1/8; 12.5%). None of the patients were in the age group of 31-45 years. The total number of patients in the study population was 8 and the age group of 46-60 years had the highest number. [Table 1]

Among the eight patients, five (62.5%) were males and three (37.5%) were females. The most common diagnosis was osteomyelitis of maxilla (5, 62.5%) with two males and three females. Carcinoma of the maxilla was diagnosed in two (25.0%) patients, both males and fibrous dysplasia of maxilla in one (12.5%) male patient. Therefore, osteomyelitis was the most common pathology in this series of cases. [Table 2]

Table 1: Age-wise distribution of patients

Age group (years)	Number of patients	Percentage
15–30	1	12.5
31–45	0	0.0
46–60	5	62.5
61–70	2	25.0

Table 2: Gender-wise distribution of patients according to diagnosis

Diagnosis	Male	Female	Total	Percentage
Osteomyelitis of maxilla	2	3	5	62.5
Carcinoma of maxilla	2	0	2	25.0
Fibrous dysplasia of maxilla	1	0	1	12.5

The individual patient characteristics showed a range of age from 19–67 years, both male and female patients. Five patients had osteomyelitis of the maxilla, two had carcinoma of the maxilla and one had fibrous dysplasia of the maxilla. The duration of follow-up available ranged from 8 to 23

months, with the longest follow-up being 23 months for a 67 year-old male with osteomyelitis of the maxilla and the shortest follow-up being 8 months for a 58 year-old female with osteomyelitis. [Table 3]

Table 3: Individual patient characteristics and follow-up duration

Patient	Age (years)	Sex	Diagnosis	Follow-up duration (months)
1	67	M	Osteomyelitis of maxilla	23
2	19	M	Fibrous dysplasia of maxilla	20
3	55	F	Osteomyelitis of maxilla	18
4	51	M	Osteomyelitis of maxilla	15
5	66	M	Carcinoma of maxilla	13
6	50	F	Osteomyelitis of maxilla	12
7	48	M	Carcinoma of maxilla	10
8	58	F	Osteomyelitis of maxilla	8

DISCUSSION

A series of eight patients who underwent total maxillectomy by the midface degloving approach for various maxillary diseases was included in the present series. The age of the patients varied from 19 to 67 years, with the majority of patients (62.5%) in the age group 46–60 years. The study population comprised 62.5% males and 37.5% females. In the present series the most common indication was osteomyelitis of the maxilla (62.5%), followed by carcinoma of the maxilla (25.0%), and fibrous dysplasia (12.5%). This distribution is different from that of recently published series where neoplastic lesions were more common. Sheen et al. reported 9 patients who underwent total maxillectomy without orbital exenteration via midface degloving, 7 of which had malignant tumors and 2 benign tumors, with a median age of 61 years.^[9]

The inflammatory disease predominance in the current series, however, illustrates the validity of the midface degloving approach for indications other than neoplastic. Zachariah and Neelakandan reported 9 cases which were treated using the midface degloving approach, comprising 7 maxillary tumors and 2 maxillary cysts, and noted that excellent exposure was obtained in all cases.^[6] Their results suggest that this technique can allow for good access to the maxilla and surrounding midfacial structures. In a similar fashion, Kitagawa et al. reported success with the technique in 13 patients with maxillary lesions; 8 benign and 5 malignant, and all of the patients had the planned procedure without significant complications.^[10]

A major benefit of the midface degloving technique is the wide access gained without an external facial incision. Price

et al,^[11] described the technique as allowing excellent exposure of the midface, nasal cavity, paranasal sinuses, nasopharynx and skull base without facial scarring or deformity. This anatomical advantage is especially relevant in total maxillectomy to visualize the area for the osteotomies and retrieve the maxillary specimen. In this current series the technique used intranasal and intraoral incisions and the soft-tissue envelope was elevated up to the infraorbital region, allowing access to the maxilla without an external incision being visible. The results are similar to those of Zachariah et al. who emphasized the bilateral exposure of the maxilla, zygoma, paranasal region and infraorbital margins afforded by the approach.^[6]

The use of midface degloving for a benign fibro-osseous disease has also been reported in the literature, thus supporting the use of the procedure in one patient in the present series. Kang et al. described the successful treatment of fibrous dysplasia of the maxilla by midfacial degloving with adequate exposure, stable postoperative findings, no scar and no significant functional disability.^[5] Likewise, Yang et al. have described 5 cases of extensive maxillofacial fibrous dysplasia, which were managed with total or subtotal resection and reconstruction via the approach without complications or facial scarring.^[12] However, proper patient selection is still a key factor. Sheen et al. especially mentioned that lesions that are more lateral towards the zygomatic arch or infratemporal fossa may be less accessible via midface degloving.^[9] The follow-up period in the present series varied from 8 to 23 months, thus permitting evaluation of postoperative clinical status over a relatively long time period in this small case series.

Strengths and Limitations: The strengths of the current study are the focused assessment of total maxillectomy by the midface

degloving approach, the range of maxillary pathologies included, the detailed evaluation of the perioperative and postoperative outcomes, and the relatively long follow-up period, up to 23 months, which enabled the evaluation of both early and later postoperative outcomes. There are however a number of limitations to the study, such as: retrospective study, small number of patients (n=8), single centre, purposive sampling, and heterogeneity of underlying pathologies. The lack of a control group that received conventional external approaches (Weber–Fergusson incision) makes it difficult to compare the results of the surgery and postoperative results, and the small number of patients makes it difficult to make statistical inference and generalization of the results. Additional prospective, multi-center trials involving more patients and comparative analysis of surgical techniques are indicated.

CONCLUSION

The midface degloving approach is a valuable surgical technique for selected patients who require total maxillectomy, to improve the access to the maxilla and surrounding midfacial structures without external facial incisions and visible facial scars. In the present case series, it was successfully used for various pathologies of the maxilla such as inflammatory, malignant and benign fibro-osseous disease with good surgical exposure and follow-up. The major benefits are preservation of facial appearance, good access for large maxillary resections, and no complications of external approaches. In experienced hands of surgeons who are specialized in advanced midfacial surgery, midface degloving is a valuable alternative to conventional external approaches for appropriately selected cases of total maxillectomy.

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Conflicts of interest

There are no conflicts of interest.

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