Modified Incision for Maxillectomy: Our Experience

Kranti Bhavana · Isha Tyagi · Mukesh Kumar Ramani

Received: 4 February 2010 / Accepted: 30 January 2011 / Published online: 23 February 2011
© Association of Otolaryngologists of India 2011

Abstract Radical maxillectomy has usually been done by the classical Weber Ferguson incision since age old times and still is being used widely due to its advantage of excellent exposure and minimal scarring as the incision follows the natural skin crease. In our modification of radical maxillectomy incision we avoid a scar on the midface by performing a midface degloving and combining it with a subconjunctival eye incision thus avoiding any cosmetic deformity and associated eye complication. It also avoids the late complication of cutaneous fistula following radiotherapy to these areas and due to early healing of the wound, early radiotherapy can be started.

Keywords Weber Ferguson · Total maxillectomy · Cosmesis · Midface degloving

Introduction

Removal of paranasal sinus tumours is a challenging exercise as far as the surgical planning and further reconstruction is concerned which may then be considered in three phases. First, one must assess the bony and soft tissue structures to be included for en bloc resection. Second, the approach must be designed to provide adequate exposure while preserving functional tissue and cosmetic integrity whenever possible. Third, the repair should be planned to

use prosthetics or soft tissue techniques to best advantage [1]. As far as radical maxillectomy is concerned the classical Weber Ferguson incision has been routinely used since age old times and still is being used widely due to its advantage of excellent exposure and minimal scarring as the incision follows the natural skin crease.

In our modification of radical maxillectomy incision we avoid a scar on the midface by performing a midface degloving and combining it with a subconjunctival eye incision thus avoiding any cosmetic deformity and associated eye complication. It also avoids the late complication of cutaneous fistula following radiotherapy to these areas and due to early healing of the wound, early radiotherapy can be started.

Materials and Methods

Fifteen patients of maxillary tumors were treated in the ENT Department of Sanjay Gandhi Post Graduate Institute Lucknow in a duration of 2.5 years (May 2004–December 2007). Stage T1 and T2 were selected for the above mentioned surgical approach of total maxillectomy. The patients with involvement of posterior wall of maxilla were not operated by this modification.

The modification of the classical maxillectomy approach and the surgical steps used are described in detail below.

Eye Incision

First local infiltration is given at both medial and lateral canthus of eye. Then we give a lateral “z” shaped incision of about 1 cm at the lateral canthus and the medial canthus. These two incisions are joined together by incising conjunctiva in the lower fornix (Fig. 1). For this purpose stay

K. Bhavana (✉) · I. Tyagi · M. K. Ramani
Department of Neurotology, Sanjay Gandhi Post Graduate
Institute of Medical Sciences (SGPGIMS), Rai Barailley Road,
Lucknow 226014, India
e-mail: karnti_bhavana@yahoo.co.in

I. Tyagi
e-mail: ityagi@rediffmail.com

Fig. 1 Schematic diagram showing the lateral and medial canthal incisions and the subconjunctival incision. The other half depicts the dissected tarsal plate which lies inferiorly

sutures are passed at each end of tarsal plate. Lower lid is then pulled outwards and downwards thereby exposing the conjunctival fornix which can then be incised. Incision is then deepened to the bone incising periosteum at inferior orbital margin. Periosteum is elevated over the inferior orbital plate as well as on the anterolateral wall of maxilla and root of zygoma (Fig. 2).

Midface Degloving

A mid face degloving incisions are given and on the side of the lesion the incision is extended behind the maxillary tuberosity. Pyriform aperture is exposed and a midface degloving is done. Periosteum is elevated from anterolateral wall of maxilla up to the inferior orbital rim thereby meeting the eye incision described above. Now we have the anterior wall free from the soft tissue attachments. The frontal process, zygomatic process of maxilla is also easily exposed as these are the areas for carrying out osteotomies. The muscles attached on the pterygoid plates are then divided.

Fig. 2 Intra Operative view of the modified eye incisions for the maxillectomy. The tarsal plate has been dissected and turned downwards and inferiorly

Osteotomies

By using broad dural retractors periosteum of orbit is retracted gently to expose the floor of orbit and the inferior orbital fissure. The orbital osteotomies are now performed. Through the lateral extension of incision, zygomatic process is divided thus maxilla can be removed after performing the lower osteotomies on the palate, nasal process of maxilla and the pterygoid.

Delivering the Specimen Out

Now the specimen can be removed in single piece by cutting the remaining soft tissue attachments with scissors.

Repair and Closure of the Cavity

The conjunctival incision is sutured with 4–0 vicryl sutures, periosteum and skin on the lateral and medial canthus are closed separately. The “z” shaping of the incision also minimizes the scarring.

We prefer lining the cavity with split thickness skin graft which helps in better epithelialisation of the cavity [1, 5].

Post Operative Results

Since we are avoiding any midface incision and external eye incision, all the complications associated with them are averted. The pre and post operative CT scans validate the above claim of complete tumour removal using the modified incision described by us (Fig. 3).

Discussion

Maxillary tumors are mainly treated by a combined approach of surgery and radiotherapy. A combination of these two modalities give the best results in terms of survival [1–3] and of them surgery followed by irradiation is the line of treatment preferred by most [2–4]. Surgical resection therefore remains the initial treatment of choice for nearly all tumours of the nasal cavity and paranasal

Fig. 3 Coronal CT scan showing the post operative absence of maxilla on the left side, complete tumour removal is possible from this incision

sinuses. The surgical approach mainly entails clearance of the tumour mass with safe margins. For this purpose the classical approach involves incision on the midface with suitable modifications as required depending on the stage of the tumour (Figs. 4, 5).

Staging and Treatment Options for Maxillary Tumours

Many staging had been earlier devised for classifying maxillary tumours but the internationally accepted TNM classification is the most feasible of all [4].

Fig. 4 The excellent cosmetic response following maxillectomy by the described incision. There is no external scar on face and after prosthesis the results are good

Fig. 5 Patient has undergone maxillectomy as well as radiotherapy. The incidence of wound dehiscence after radiotherapy is minimal with this incision

-
T1	Tumour limited to the antral mucosa with no erosion or destruction of bone
T2	Tumour causing bone erosion or destruction, except for the posterior wall, including extension into hard palate and/or middle meatus
T3	Tumour invades any of the following: bone of posterior wall of maxillary sinus, subcutaneous tissues, skin of cheek, floor of medial wall of orbit
T4	Tumour invades orbital contents beyond the floor or medial wall including apex and/or any of the following: cribriform plate, base of skull, nasopharynx, sphenoid sinus, frontal sinus
-

Surgical treatment alone is considered appropriate for nearly all benign tumours and early staged malignant tumours. Advanced malignant tumours extending to pterygopalatine and infratemporal fossa are best treated by surgical resection and post operative radiotherapy. Advanced unrespectable tumours are treated by simultaneous systemic chemotherapy and hyper fractionated radiotherapy. The surgical options available for maxillary tumours can be broadly categorized into:

- (a) Inferior medial maxillectomy
- (b) Medial maxillectomy/lateral rhinotomy
- (c) Radical maxillectomy.

The surgical approach for maxillary sinus tumours depends on the spread and simultaneous involvement of important structures by the tumour. In all the above

mentioned surgical approaches the incisions are classically given on the face along with some modifications as required [1, 4]

- (a) Lateral rhinotomy
- (b) Weber Ferguson incision
- (c) Weber Ferguson incision with Lynch extension
- (d) Weber Ferguson incision with lateral subciliary extension
- (e) Weber Ferguson incision with subciliary and supra-ciliary extension.

Technical Aspect of Modified Incision

It is our observation that the most disfiguring fact about Weber Ferguson incision is the scar below the eye and complications associated with it. If not given carefully, it can easily lead to ectropion, telecanthus and other eye complications, which are unacceptable to the patient. We have developed a modification of this standard procedure by eliminating the incisions to a large extent as will be evident from the post operative pictures of these patients. They are better preserved in comparison to those patients who had the undergone surgery by the classical Weber Ferguson incision.

The above mentioned modification of classical maxillectomy approach can be easily used for stage T1 and T2 tumours where the posterior wall of maxillary antrum is not involved. Lesions approached by lateral rhinotomy, medial maxillectomy and even radical maxillectomy can be approached by this modified method described by us.

Conclusion

The above described modification of incision for maxillectomy has many advantages over the classical Weber

Ferguson incision and in the present times of aesthetic awareness among patients, it holds more relevance.

This modified approach avoids external facial incision and hence is cosmetically well accepted by the patient. Eye complications related with the classical Weber Ferguson incision like ectropion and telecanthus are avoided and vitality of the skin flap is also well maintained. Due to early healing post operative radiotherapy can be started early and incidence of wound breakdown following radiotherapy is also less with this approach.

Some limitations of this approach includes vestibular stenosis, malar paresthesias (which is also seen with Weber Ferguson approach) and inability to clear the posterior limits of the tumour.

References

1. Shah J (1996) Nasal cavity and paranasal sinuses. Head and neck surgery diagnostic approaches, therapeutic decisions, surgical techniques and result of treatment, 2nd edn. Mosby-Wolfe, London, pp 53–74
2. Watkinson JC, Gaze MN, Wilson JA (2000) Tumours of the nose and sinuses. Stell and Maran's head and neck surgery, 4th edn. Butterworth-Heinemann, Oxford, pp 381–389
3. Donald PJ (1997) Management of sinus malignancy. *Curr Opin Otolaryngol Head Neck Surg* 5:73–78
4. Har-El G, Lucente FE (1996) Midface degloving approach to the nose and sinuses and skull base. *Am J Rhinol* 10:17–22
5. Butler Charles E (2001) Skin grafts used in combination with free flaps for intraoral oncological reconstruction. *Ann Plast Surg* 47(3):293–298