To Study the Effect of Orbital Sling on Post Operative Vision in Cases of Maxillary Carcinoma Undergoing Total Maxillectomy

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Received: 24 January 2014 / Accepted: 13 March 2014 / Published online: 25 March 2014
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Abstract To study effect of orbital sling on post operative vision in cases of maxillary carcinoma undergoing total maxillectomy. All patients with the principal procedure of “total maxillectomy” for histopathologically proven cases of carcinoma maxilla in department of otorhinolaryngology and head-neck surgery, N.S.C.B. medical college, Jabalapur, Madhya Pradesh, India from July 2011 to October 2013 were included. Out of the 20 patients irrespective of whether orbital sling was created or not, maximum number of patients 8 (40 %) showed a 3 step improvement, and maximum improvement seen was up to five steps. Out of the 14 patients in which orbital sling was created maximum number of patients 7 (50 %) showed a 3 step improvement, and maximum improvement seen was up to five steps. Out of the 6 patients in whom orbital sling was not created maximum number of patients 3 (50 %) showed a 2 step improvement, and maximum improvement seen was up to three steps. Infraorbital repair

with the help of sling results in better improvement of vision as compared to those in whom sling was not or could not be made with no significant difference on eye movements.

Keywords Total maxillectomy · Maxillary carcinoma · Orbital sling · Vision in total maxillectomy

Introduction

Malignant tumours of sinonasal tract usually present as advanced disease because early diagnosis is difficult. Radical surgical excision remains the mainstay of the treatment. The classic surgical treatment for sinonasal tumours in close proximity to the orbit involved radical excision with orbital clearance or exenteration. After the introduction of orbital preservation surgery, the indications and need for removal of orbital structures have diminished [2].

Support of the orbit after removal of the maxilla is important to maintain the normal functions of the preserved eye. Various ways of orbital support include the use of pericranial flap, bone grafts and alloplastic implants [3].

The aims of reconstruction after tumor resection are to have adequate cranionasal and oronasal separation, restore dental and facial defects, provide cheek and orbit support so that the important functions of vision, deglutition, speech and nasal airway passage are maintained. [4]

In this article we present a comparison of vision improvement between two groups undergoing total maxillectomy; 1st with orbital floor repair and 2nd with no such repair. The effect of maxillectomy on vision and eye movements of the two groups are being discussed.

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Aims and Objectives

- (1) To compare the effect of orbital sling on post operative vision in cases of maxillary carcinoma undergoing total maxillectomy with those in which sling was/could not be made.
- (2) To compare restriction in eye movements between the 2 groups.

Subjects and Methods

All patients with the principal procedure of “total maxillectomy” for histopathologically proven cases of carcinoma maxilla in department of otorhinolaryngology and head-neck surgery, N.S.C.B. medical college, Jabalapur, Madhya Pradesh, India from July 2011 to October 2013 were included.

Regardless of indications of the procedure or the stage of the disease in which patient presented, the patient were categorized into two cohorts

- (1) Those in which orbital floor was repaired with orbital sling as done routinely.
- (2) Those in which orbital floor was not or could not be repaired.

Repair of overlying muscles, fascia and skin was done in similar way in all the study cases and if significant difference was noted e.g. torn or deficient fascia or muscles, the subject was excluded from the study.

The patient's post surgical wound in all cases was cleaned and dressed daily and patient's vision was examined every alternating day. The postoperative vision of both the groups were compared with preoperative vision to study the effect of displacement or compression of orbit by the tumour and also the comparison was made in between the groups to observe whether sling formation makes any significant difference in vision.

Vision was tested by snellen's chart and acc. to improvement in number of steps e.g. if vision improved from perception of light to 6/36, the improvement score was given as 3 (from step 8 to step 5). Hence minimum possible score was taken as 0 i.e. no improvement an maximum possible score 7 i.e. from perception of light to 6/6 (Table 1).

Observations and Results

1. Among the patients included in the study 11 (55 %) were males and remaining 9 (45 %) were females.
2. Most of the patient belonged to the age group of 36–50 years with distribution as: Table 2

Table 1 Scale followed to asses improvement in vision following procedure

Vision	Step	Vision	Step
6/6	1	6/36	5
6/9	2	6/60	6
6/12	3	Finger counting	7
6/24	4	Perception of light	8

Table 2 Age distribution of patients under study

S. No.	Age group (in years)	No. of patients	Percentage
1	0–20	0	0
2	21–35	1	5
3	36–50	9	45
4	51–65	7	35
5	66–80	3	15
	Total	20	

Table 3 Improvement in vision of the patients

S.No.	Improvement in vision score	Number of patients	Percentage
1	0	0	0
2	1	2	10
3	2	6	30
4	3	8	40
5	4	3	15
6	5	1	5
7	6	0	0
8	7	0	0
9	Total	20	

3. Out of the 20 patients irrespective of whether orbital sling was created or not, maximum number of patients 8 (40 %) showed a 3 step improvement, and maximum improvement seen was up to 5 steps (Table 3).
4. Out of the 14 patients in which orbital sling was created maximum number of patients 7 (50 %) showed a 3 step improvement, and maximum improvement seen was up to 5 steps (Table 4).
5. Out of the 6 patients in whom orbital sling was not created maximum number of patients 3 (50 %) showed a 2 step improvement, and maximum improvement seen was up to 3 steps (Table 5).
6. Comparison of patient having restriction in eye movements between those in whom orbital sling was made as compared to those in whom it was not made: Table 6

Table 4 Improvement in vision in patients in whom orbital sling was created

S.No.	Improvement in vision score	Number of patients	Percentage
1	0	0	0
2	1	0	0
3	2	3	21.4
4	3	7	50
5	4	3	21.4
6	5	1	7.14
7	6	0	0
8	7	0	0
9	Total	14	

Table 5 Improvement in vision in patients in whom orbital sling was not made

S.No.	Improvement in vision score	Number of patients	Percentage
1	0	0	0
2	1	2	33.3
3	2	3	50
4	3	1	16.6
5	4	0	0
6	5	0	0
7	6	0	0
8	7	0	0
9	Total	6	

Table 6 Comparison of eye movements

S.No.		No. of patients	Percentage
1	Orbital sling	2/14	14.3
2	No orbital sling	1/6	16.7
	Total	20	

Discussion

In our study, out of the 20 patients who underwent total maxillectomy, irrespective of whether orbital sling was created or not, maximum number of patients 8 (40 %) showed a 3 step improvement, and maximum improvement seen was up to 5 steps. Out of the 14 patients in which orbital sling was created maximum number of patients 7 (50 %) showed a 3 step improvement, and maximum improvement seen was up to 5 steps. Out of the 6 patients in whom orbital sling was not created maximum number of patients 3 (50 %) showed a 2 step improvement, and maximum improvement seen was up to 3 steps.

These figures clearly show that creation of orbital sling during repair in total maxillectomy patients is necessary for attaining good vision

Reconstruction of orbital floor after total maxillectomy should provide support to the orbital contents, reconstruct the palatal surface, achieve facial symmetry and a good aesthetic result. Repairing lost orbital support decreases the risk of globe malposition, diplopia, and disturbance of extraocular muscle function, as well as lid malposition and ectropion resulting in exposure keratitis [1].

Minimal bony resection such as isolated orbital wall (lateral or medial) or small orbital floor defects do not require any kind of reconstruction. Resection of medial orbital periosteum can be repaired with split skin or fascia lata with minimal morbidity. [2]

Larger defects in the orbital floor can be repaired using a thick fascial sling tightly secured to the margins of the bony defect. With subtotal or total floor defects (> 75 % surface area) and multisegmental defects, orbital floor and one or more walls, some form of rigid reconstruction is advisable.

Primary reconstruction of total maxillectomy defects with preservation of orbital contents remains a complex problem without a perfect solution. These methods include skin graft or a temporalis muscle sling, the sheath of the upper portion of the rectus abdominis muscle or other related procedures, but they have also resulted in complications, such as enophthalmos, diplopia, and facial deformity. Nonvascularized bone grafts or a titanium or synthetic polyethylene mesh, in conjunction with a soft tissue free or pedicled muscle flap, can be used to reconstruct the orbital floor.

Split ribs, iliac crest grafts, or even vascularized calvarial bone flaps, [5] radial forearm osteocutaneous flaps [6, 7] or coronoid- temporalis pedicled rotation flaps have been used for reconstruction of the orbital floor.

Conclusion

The authors conclude that maxillectomy results in improvement of vision irrespective whether infraorbital sling was made or not.

Also that infraorbital repair with the help of sling results in better improvement of vision as compared to those in whom sling was not or could not be made.

The study did not show any significant co-relation of restriction of eye movements in relation to whether sling was created or not.

Conflict of interest None declared.

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