ORIGINAL ARTICLE

Modified Imre's horizontal cheek advancement flap for medial cheek defects: advantages and outcomes

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Abstract:
Introduction: The ideal tissue for defects of medial cheek is obviously lateral cheek. Different designs have been described to achieve aesthetic outcome. The purpose of this article is to discuss lateral based modification, also called Modified Imre's cheek advancement flap and its advantages over traditional designs.
Material and methods: this is a retrospective discriptive study carried out in the department of plastic surgery, of Bolan Medical Complex Hospital and Jilani Hospital, Quetta from September 2010 to December 2015. The record of the patient with moderate sized medial cheek defects covered with this flap was reviewed and put on a predesigned proforma. The result analysed by using SPSS version 17.
Results: Twenty three patients underwent reconstruction with the flap. Most common etiology was basal cell carcinoma with an average size of ranging between 3 to 5.5 cm. All flaps survived completely with transient facial nerve palsy noted in two patients and mild tip necrosis in only one patient.
Conclusion: modified Imre's flap requires less dissection as compared to Mustarde's flap, less hematoma formation, and has good reliability in coverage of medial cheek defects.

Key words: basal cell carcinoma of cheek, transient facial nerve palsy, medial cheek defect, modified Imre's flap

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Introduction:
Although Cheek lies in the peripheral zone of face[1] yet it is highly noticeable and frequently affected by skin cancers. Medial cheek defects are categorized as zone-I by Gonzalez[2] while according to Jackson's[3] classification, two zones are included in medial cheek:superomedial and alar base-nasolabial. Larabee[4] has further classified medial cheek unit on the basis of size. Small defects are less than 1/4th of entire subunit andcan usually be closed primarily or by v-y islanded flap. Medium defect is 1/4th to 1/3th of entire subunit also amenable to extended direct closure. Large defects are 1/3rd to 3/4th of entire subunit that require cheek rotation or advancement while entire subunit require cervicofacial flaps. The principles of facial reconstruction apply to cheek in the same way as they apply to any other facial subunit. Ideal reconstruction must restore natural contour, maintain beard patterns and imperceptible scars Two popular cheek flaps for large medial defects are Mustarde's[5] design or Imre's[6] design, both mobilize tissue in different directions. Mustarde's design of cheek flap also called lateral cheek rotation flap requires extensive undermining and risk of hematoma formation is higher while inferiorly based Imre'sdesign is more prone to ectropion. Modified Imre's flap takes advantage of both Imre and Mustarde'sand is a sort of advancement flap rather than rotation flap. Jackson[3] has named this sort of flap as horizontal advancement cheek flap. It requires less undermining leading to less hematoma formation and decreased operative time, and utilizes

Pic.1.1 *A patient with basal cell carcinoma of nose and cheek*

Pic.1.2 *Excision in local anaesthesia*

Pic.1.3 *reconstruction with modified Imre's flap*

Pic.1.4 *After healing of flap folded forehead flap was used for nasal reconstruction*

Pic. 2.1 *A patient with a large basal cell carcinoma of nose and cheek*

Pic. 2.2 *Excision in local anaesthesia*

Pic. 2.3: *use of modified impared flap to cover the defect*

Pic. 2.4: final photographs after reconstruction

Pic. 3.1: *Excision of basal cell carcinoma of cheek*

Pic. 3.2: *Modified Imre's flapflap. for reconstruction*

Pic. 3.3: *Final potograph after reconstruction*

neck laxity to its advantage in older population. The scars of the flap are also in natural skin creases and become imperceptible with time. The aim of this article is to document reliability, advantagesand complications of using modified Imre's flap for medial cheek defects.

Material and methods:

This retrospective study was carried out in plastic surgery department of Bolan Medical Complex Hospital, and Jilani Hospital, Quetta from September 2010 to December 2015. All patient with medial cheek defects either cheek only or cheek with nose or lower eyelid reconstructed with modified Imre's cheek advancement flap were included in the study. All of the defects resulted from excision of skin cancers. Patient's age, gender, size of defect, operative time were noted for all patients. To measure outcome following variables were noted like hematoma formation, partial or total necrosis of flap, infection, ectropion or entropion, facial nerve affected, appearance of scars and need of revision surgery.

Operative technique:

Before tumor excision, area to be excised and flap to be advanced were infiltrated with 0.5% lignocaine with epinephrine. Feasibility of flap was assessed by pushing cheek skin medially and superiorly with fingers as suggested by Jackson. Marking for superior incision was marked along superior edge of defect while inferior incision was at nasolabial incision.Flap was elevated in superficial facelift plane. In case of composite defect of cheek extending into nose, cheek flap was used to re-construct cheek defect while forehead flap was used for nasal defect. Where nasal defect was full thickness, only cheek re-

construction was performed while nasal reconstruction was deferred till cheek flap healed at its new location. To prevent lateral migration, this flap was hitched to periosteum of the nasal bone or pyriform aperture with 3-0 permanent sutures. No drains were used and no dressings were applied. Patients were asked to apply antibacterial skin ointment to sutured area till the sutures were removed after a week.

Results:

Twenty three patients were identified during the study period. There were ten males and thirteen females. Age ranged from 40 to 90 years. Majority 19 patients were due to basal cell carcinoma excision, 2 patients had squamous cell carcinoma and 1 had malignant melanoma. Twelve patients had composite defects of nose extending into cheek and eleven patients had medial cheek only defects. Size of cheek defects ranged from 3 cm to 5.5 cm. In three patients, bony resection was also performed. Twenty one patients had their operations in local anaesthesia while two had in general anaesthesia. There was no wound infection or hematoma formation. Five patients had complications. One patient had peripheral less than 1 cm necrosis that did not require any surgical intervention. Two patients had transient facial nerve palsy that resolved spontaneously. One patient developed ectropion while one patient had entropion.

Discussion:

Lateral cheek is, un-doubtfully, the ideal tissue for re-construction of medial cheek defects of large size[7]. A variety of cheek flaps like modified Tenzel rotation flap[8], Mustarde rotation flap[9] and rotating island pedicle flap[10] have been described.

The flap we have used is not a new flap and is well described. Modified Imre's flap uses two incisions. The superior incision usually lies over infraorbital rim so there is no need to anchor it to infra orbital rim thus saving operative time. However, anchoring to periosteum is necessary if upper incision lies above orbital rim. Inferior incision lies in nasolabial groove. The flap advances in such a way that it utilizes the lax skin in the neck usually present in older patients to its advantage for coverage of medial cheek defects.

With the advent of perforator flaps and concept of keystone perforator island flaps[11], this flap can be considered a modified keystone flap without islanding. This is because undermining in the area of superficial temporal artery is not done, thus maintaining the perforators arising from it and supplying the flap in contrast to traditional Jackson's designed flaps. It seems that this flap has better vascularity as is confirmed by our results where we have encountered only one partial necrosis (4%). There has been report of 10% partial flap necrosis with Jackson design flaps[12].

Inherited deficiency of Imre's type flap is gravity works against it. Pin cushioning may result and causes facial asymmetry[13]. However, modified Imre's flap utilizes both inferior and lateral cheek thus obviating this problem with the obvious advantage of rapid and reliable elevation especially in older population. However, superior incision results in lid edema (figure 3.3) that settles with time.

Conclusion:

Horizontal cheek advancement flap or modified Imre's flap should be considered a first line option for coverage of medium medial cheek defects because of its reliability, rapid elevation and minimal complications.

Role and contribution of author(s):

Dr Faisal Ashfaq, MCPS, FCPS (Plastic Surgery), Assistant Professor, Department of Plastic Surgery and Burns, Bolan Medical Complex Hospital, Quetta, is the principal author, collected the data, write the discussion result and conclusion.

Conflict of Interest: None

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