Functional comparison between Karapandzic and Gillies technique in lower lip tumors

Nisar Ahmed Mangi, Syed Arif Hussain, Mohibullah Khan Ghilzai

Abstract:
Objective: To compare the functional results of Gillies and Karapandzic technique in malignant lip tumor in our setup.
Study Design: Case Series
Setting and Duration: This study was conducted in the Dept. of Plastic Surgery Jinnah Post Graduate Medical Centre from January 2000 to 2006.
Methodology: All patients admitted were diagnosed case of squamous cell carcinoma of lower lip - Biopsy has been performed before the surgery to confirm the diagnosis. All the base line investigations done. Including HBsAg Anti Hcv, Complete Blood Picture, BT, CT, blood sugar / Urea creatinine. Electrogtic CT scan was performed in patients for bone involvement.
Results: 28 patients were included in the study. 18 patients (64%) were operated with Gillies fan flap and 10 (36%) with Karapandzic technique. Mean age of the patients were 52+7 male patients were 17 (60.7%) and female were 11 (39.3%). Out of 17 male 52% were selected for Gillies fan flap technique and 47% for Karapandzic technique. Out of female 81.8% for Gillies and 18.2% for Karapandzic were selected.
Conclusion: Successful reconstruction depends on proper planning, gentle handling of tissues, fine instrumentation, and use of proper suture material. Our department is a tertiary unit and it caters the patients from all over the Pakistan. Surgeon experience is the most critical factor for a positive outcome in treating such patients. It is the need of time that the awareness program should be under taken to educate the masses about the hazards of pan, beetel nuts, ghutka and tobacco through the media and also encourage to go to the right physician and surgeon at the early stage so that early medical intervention is possible.

Keywords: Lower lip tumors, excision, reconstruction procedures Karapandzic & Gillies methods.

Introduction:
Lip defects may be congenital, unilateral and bilateral. cleft lip being primary examples - defects are also due to acquired problems such as trauma (e.g gunshot, road traffic accidents, infectious disease vasculitis (e.g lupus) and malignancies. The degrees of substance loss may be skin, muscle or mucosa or any combination of these layers.

Sir John suckling described beautiful lips of the year in a poem.

Her lips were red, and one was thin
Compared with that was next her chin,
Some bee had stung it newly.¹

In an evaluation of the patients, the size of the lesion and the width of lip removal must be assessed. Contraction of the orbicular oris muscle and stabilization of the modulus achieve lip seal, this being achieved by the interweaving of the sphincter and dilator systems.²

Lower lip tumors should be treated aggressively by the reconstructive surgeon.
The anaplastic tumors and commissural lesions often require tumors free margins and lymph nodes dissection in the neck. Reconstructive options for lip defects, whether due to trauma or malignancy are numerous with the extent of defect deciding the particular option available. For smaller defects which are less than one third of the width of the lip, direct closure is acceptable 3.

Simple closure has the beauty that it doesn’t cause oral distortion and preserves the continuity of the vermilion border, sensation and muscle function. Many lip repairs utilize the adjacent cheek muscles as was pioneered by Gillies and later modified by Mc Greger.

The Gillies fan flap is the extended version of Estlander flap, which advocates lip sharing, the commissure is some what distorted and the lower lip is shortened.

The Sphincter action of the lip may be reduced. The movements of the lip with emotions are somewhat distorted. Reconstructive techniques that utilize full thickness nasolabial tissue may also denervate the upper muscle to some extent.

Among numerous surgical procedures Mr.Karapandiz introduced a reconstructive option that fulfills most of the goals required for a good reconstruction. It borrows lip tissue from the upper lip and adjacent tissue. This is the reason that it is a procedure of choice in a lip defect of 70-80%. However it gives better result if the commisure is not involved. This procedure gives a functional lower lip, with minimal distortion and external disfigurement. The reconstructive method may reduce the size of the oral aperture.

A microstomia result may require considerable post operative lip stretching 4.

The ideal oral aperture should be sufficient to allow ingress of cutlery, solid food and possibly dentures and permit adequate dental hygiene and care. Although lip surgery has little long term effect on speech 5. It may leave the lips with reduced sensation and elasticity 6.

Methodology:
All patients admitted were diagnosed case of squamous cell carcinoma of lower lip. Biopsy was performed before the surgery to confirm the diagnosis. All the basic line investigations done. Including HBsAg Anti Hcv CBC, BT,CT, blood sugar / Urea creatinine. Electrogtic CT scan was performed in patients for bone involvement.

Results:
28 patients were included in the study. 18 patients (64%) were operated with Gillies fan flap and 10 (36%) with Karapandzic technique table 1. Mean age of the patients were 52+7 male patients were 17 (60.7%) and female were 11 (39.3%). Out of 17 male 52% were selected for Gillies fan flap technique and 47% for Karapandzic technique. Out of female 81.8% for Gillies and 18.2% for Karapandzic were selected.

Discussion:
Lip tumors can be classified into benign and malignant. In our country squamous cell carcinoma of the lip is more common than other parts of the world, which is probably due to the excessive intake of tobacco and the chewing of pan, ghatu or betelnuts. Lack of literacy and social well being may also play a vital role and this single factor leads to the late presentation of the tumor.

Initially in a large majority of cases the tumor presented as a single nodule, which most of the time is neglected by the patients and due to above mentioned reasons sometimes the patient instead going to doctor present themselves to the Hakeems or spiritual healers. This sequence of events leads to tumor free and second to reconstruct and restore function to normal or near normal, which is very taxing even to the best surgeons. The lips have an important aesthetic and functional role that makes them essential to normal life. Aesthetically they anchor the central cluster of
fascial features that define each person’s appearance and make one individually recognizable in society. Their functional role includes the complex processes of speech expressing emotions, romantic interaction, ingestion of food and drink and maintenance of oral commissure. These roles are essential to the most basic patterns of human interaction and nourishment. Thus lips loss a major deformity produces a devastating alteration of normal life. In addition to this, lips are highly vulnerable to trauma and the contractile process of burns. Like eyelids and digits, they are delicately structured and easily distorted.

As plastic surgery has achieved sophistication, much more is expected from the plastic surgeon in the treatment of lip cancer.

Essential aesthetic and functional requirements place exceptional demands on techniques and tissues chosen for reconstruction. Few available donor sites can provide all of the requirements to restore missing skin cover, oral lining, appearance of a vermilion, a labial sulcus, commissure definition, adequate stomal diameter, sensation and a competent oral sphincter.

Meeting all of these requirements and achieving a high quality aesthetic and functional outcome requires exceptional technical skills, knowledge of functional anatomy and familiarity, with historic and contemporary techniques. Lip tumors if left untreated or even if not treated with a strict scientific protocol, give rise to complications like facial distortion, continued drooling and above all, a continuous bad odor from the mouth of the patient, hence making it difficult for the individual to move freely in society. He or she is unable to work among the co-workers. These problems arise on jobs and even results in loss of job. If he or she is the sole earner, then the whole family may suffer because of the illness.

Many techniques for lip reconstruction have been described and applied throughout history, particularly during the past 200 years. Which involves the local rotation flap and as well as free flap like radial forearm flap.

A more recent application is the use of the folded forearm flap to replace both the skin an inner lining, simultaneously, in full-thickness cheek and lip defects. The folded forearm flap solves the reconstructive problem for each patients in a single-stage procedure, providing good contour and a reasonable color match. The flap is easy to raise, has a long pedicle with large-diameter vessels, and has an acceptable donor site defect not associated with long-term morbidity.13,14,15,16

However these rarely have all of the requirements described above been met satisfactorily. Like Schuchardt or stepladder technique, could

Table 1: Numbers of patients in Two Techniques

<table>
<thead>
<tr>
<th>Technique</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gellies Fan Flap Technique</td>
<td>18</td>
<td>52.11</td>
<td>6.88</td>
</tr>
<tr>
<td>Karapandzic Technique</td>
<td>10</td>
<td>49.80</td>
<td>6.87</td>
</tr>
</tbody>
</table>

t=0.85, p>0.40 (Non-significant)

Table 2: Distribution of patients Gender in Two Techniques

<table>
<thead>
<tr>
<th>Sex</th>
<th>Gillies</th>
<th>Karapandzic</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>9</td>
<td>8</td>
<td>17</td>
</tr>
<tr>
<td>Male % within technique</td>
<td>50.0</td>
<td>80.0</td>
<td>60.7</td>
</tr>
<tr>
<td>Count</td>
<td>9</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Female % within technique</td>
<td>50</td>
<td>20</td>
<td>39.3</td>
</tr>
<tr>
<td>Total Count</td>
<td>18</td>
<td>10</td>
<td>28</td>
</tr>
</tbody>
</table>

Fisher exact test: Gender vs Technique = 0.23, p>0.12 (non-significant)

Table 3: Functional results

<table>
<thead>
<tr>
<th>Functional Class</th>
<th>Gillies</th>
<th>Karapandzic</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Poor % within technique</td>
<td>5.6</td>
<td>20.0</td>
<td>10.7</td>
</tr>
<tr>
<td>Count</td>
<td>8</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>Satisfactor % within technique</td>
<td>44.4</td>
<td>60.0</td>
<td>50.0</td>
</tr>
<tr>
<td>Count</td>
<td>9</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Good % within technique</td>
<td>50.0</td>
<td>20.0</td>
<td>39.3</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
<td>10</td>
<td>28</td>
</tr>
</tbody>
</table>

Fisher exact test: Gender vs Technique = 0.23, p>0.12 (non-significant)

Table 4: Site of Tumor among Study Group

<table>
<thead>
<tr>
<th>Site of Tumor</th>
<th>No. of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Left Lip</td>
<td>9 (39%)</td>
</tr>
<tr>
<td>Central Right Lip</td>
<td>9 (32%)</td>
</tr>
<tr>
<td>Central Lip</td>
<td>10 (36%)</td>
</tr>
<tr>
<td>Total</td>
<td>10 (36%)</td>
</tr>
</tbody>
</table>
be employed to reduce the size of the defect in preparation for the Estlander flap²,8,9.

In this study two procedures were selected among the best procedures like Webster Bernard, Estlander, Abbe , Mc Gregar . Two procedures are karapandzic and Gillies fan flap technique and their comparison of the functions after the surgery.

Gillies fan flap is an extended version of the Estlander flap. It carries the commissure and lower lateral lip in word for the more medially located lower lip defects. Like the Estlander procedure the resulting commissure is distorted and the lower lip is shortened. The flap has superiorly based pedicle that provides additional tissue to the lip so that microstomina is avoided. Because the re-orientation the orbicularis oris muscle, a lack of motor function and minimal return of sensation results in this portion of the flap. Buccal advancement is often necessary to recreate the border between the vermilion and the red and white portion of lip. The Gillies fan flap rotates into position with the resected lip margin sutured to the residual medial lip. The advancement of the flap rotates the angle of the mouth with the flap.

Karapandzic technique restores the sensation and function and has the principal advantage in the successful reconstruction.

In 1974 Karapandzic described the standard procedure that functionally reconstructed the larger defect of the lower lip. This method is based on the principal that the best form of reconstruction comes from tissues that most closely resemble, the tissue being replaced, in this case lip and cheek. Musculo cutaneous flaps with a width equal to the height of the defect are formed on both side of defects.

This technique redistributes the remaining lip tissue and allows the neuro vascular supply to remain intact. This procedure utilizes lip tissue by the use of advancement and rotation segment of skin, orbicularis muscle and mucosa following the division of the other supporting muscles. The flap is slide and rotated into position while an intact neurovascular pedicle is maintained.

Accordingly, sensation and circulation of the lip is preserved and function of the orbicularis oris muscle is maintained¹⁰,¹¹.

The Karapandzic technique is easy to perform and provides excellent results for full thickness defects larger than one third of the lower lip which may include nearly the entire upper lip¹². Its advantage is to preserve the motor and the sensory function. The disadvantage includes microstomia in larger defects and the need for extensive circumoral incision and dissection.

**Conclusion:**
Successful reconstruction depends on proper planning, gentle handling of tissues, fine instrumentation, and use of proper suture material. Our department is a tertiary unit and it caters the patients from all over the Pakistan. Surgeon experience is the most critical factor for a positive out come in treating such patients. It is the need of time that the awareness program should

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Figure 1: (A) Pre-operative sq-cell ca lower lip; (B) Postoperative Gillies procedure

Figure 2: (A) Pre-operative Squamous cell carcinoma; (B) Postoperative Karapandzic procedure for reconstruction
be under taken to educate the masses about the hazards of pan, betel nuts, ghutka and tobacco through the media and also encourage to go to the right physician and surgeon at the early stage so that early medical intervention is possible.

References:
12. Lentrot J. contribution to the reconstruction of the lower lip after resection combined with rule dissection tumor J. Macillo fac surg. 1975; 3:139