Lip Cancer and Reconstruction

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Overview

- Anatomy
- Function
- Lip Cancer
  - Brief Facts
  - Pathology/Staging
  - Treatment
- Key Flaps for Reconstruction
Anatomy
Melolabial crease
Labiomandibular crease
Red Lip
White Lip
Vermillion Border
Mental Crease
Philtral Ridge
Anatomy

Superior labial artery
Buccal artery
Buccinator muscle and parotid duct (cut)
Inferior labial artery
Mental branch of inferior alveolar artery
Facial artery
Arterial Details

• Course of Facial Artery:
  – Branches off External Carotid Artery
  – Courses across the mandible to the oral commissure
  – Deep to Risorius and Superficial to Buccinator
  – Can be found approximately 1 – 2 cm from oral commissure

\(^2\)
Further Arterial Details

- **Superior Labial Artery:**
  - Deep to Zygomaticus Major
  - Gives of Angular artery then enters orbicularis oris
  - Runs along upper lip and anastamoses with opposite side

- **Inferior Labial Artery:**
  - Branches from Facial Artery near the commisure
  - Deep to Depressor Angularis Oris
  - Enters Orbicularis Oris and runs along lower lip to anastamose with opposite side
Anatomy

• Subunits
Functional Importance

- **Roles:**
  - Oral Competence
  - Deglutition
  - Expression of Emotions
  - Speech – required for 6 consonants
    - Purely Labial – “b”, “m”, “w”, “p”
    - Labial-Dental – “f”, “v”
Functional Importance

• Another key factor to consider prior to reconstruction is the patient’s dentition.

• Edentulous patients pose an important challenge to reconstruction as only a mild degree of microstomia may be acceptable if dentures are worn.
Lip Cancer Staging and Treatment
Lip Cancer Facts

• Lip Cancer Incidence – 1-2 %\textsuperscript{1}
• Most Common Oral Cavity Cancer
• Risk Factors:
  – Prolonged Sun Exposure
  – Male
  – Pipe-smoking/Tobacco Chewing
  – Alcohol consumption
Lip Cancer

• > 90 % is on red lip
• 90 % is on Lower Lip
• 90 % is Squamous Cell Carcinoma
• Basal Cell Carcinoma occurs more commonly on Upper Lip
• Excellent 5-year prognosis if < 2 cm
Lip Cancer

• Squamous Cell Carcinoma
  – Mainly on Red Lip

• Basal Cell Carcinoma
  – Mainly on Cutaneous White Lip

• Rarer Types:
  – Adenocarcinoma – secondary to minor salivary gland presence
  – Melanoma
  – Lymphoma
  – Sarcoma
Lip Cancer

- Upper Lip spreads to ipsilateral lymph nodes – Levels I – III
  - Embryologic fusion in the midline prevents contralateral spread
- Lower Lip spreads to ipsilateral and contralateral lymph nodes – Levels I - III
Staging of Lip Cancer

- **T1:** primary tumor <2 cm
- **T2:** primary tumor 2–4 cm
- **T3:** primary tumor >4 cm
- **T4:** primary tumor invades adjacent structures (e.g., through cortical bone, skin, through floor of mouth)
Treatment of Lip Cancer

• Surgical Treatment is Mainstay
  – Need 0.5 cm margins around tumor

• Neck Dissection is often performed in conjunction especially if lower lip cancer
  – Elective Supraomohyoid neck dissection for N0 necks
  – Levels I-IV neck dissection for N1-N3 disease
Radiation Therapy for Lip Cancer

• Radiation Therapy
  – May be used as primary treatment if T1 or non-operable patient
  – Also used for:
    • post-operative XRT for advanced stages
    • close margins
    • extracapsular extension
    • perineural/intravascular invasion
Reconstruction
Upper Lip Algorithm

Figure 9. Upper lip reconstruction. (From Baker S: Reconstruction of the lip. In Baker SR, Swanson NA (eds): Local Flaps In Facial Reconstruction. St. Louis, Mosby, 1995; with permission.)
Lower Lip Algorithm

Figure 17. Lower lip reconstruction. (From Baker S: Reconstruction of the lip. In Baker SR, Swanson NA (eds): Local Flaps in Facial Reconstruction. St. Louis, Mosby, 1995; with permission.)
Reconstruction Options

• Small Defect
  – Wedge Excision – Primary closure
  – Local V-Y flaps can also be used for very small defects
Full Thickness Excision: Wedge Resection

• Best suited for Lesions smaller than ½ the lip
• Can be closed as a V or W
• Good functional and aesthetic outcome
• Key is to re-approximate the vermillion border appropriately
Full Thickness Excision: Wedge Resection

Pictures courtesy of Dr. Etai Funk
Full Thickness Excision: 
Wedge Resection

Pictures courtesy of Dr. Etai Funk
Full Thickness Excision: Wedge Resection

Pictures courtesy of Dr. Etai Funk
Reconstruction Options

• Large Defect
  – Mucosal Advancement Flap
  – Abbé Flap
  – Estlander-Abbé Flap
  – Karapandzic Flap
  – Gilles Fan Flap (Nasolabial)
  – Radial Forearm Free Flap
Mucosal Advancement Flap

• For use only in lesions of the red lip
• Favored method for restoration of the vermillion
Mucosal Advancement Flap

• Key Surgical Step:
  – Undermine labial mucosa deep to minor salivary glands and superficial to the posterior aspect of the orbicularis oculi

From Baker – Local Flaps in Facial Reconstruction
Mucosal Advancement Flap

• Concerns:
  – Advanced mucosa may display a deeper red color than natural vermillion
  – Difficult to approximate vermillion line if lip skin is involved
  – Contracture of flap can lead to inversion of lip
Mucosal Advancement Flap

Pictures Courtesy of Dr. Athre
Mucosal Advancement Flap

Pictures Courtesy of Dr. Athre
Mucosal Advancement Flap

Pictures Courtesy of Dr. Athre
Abbé Flap

- Flap is based on the principle of creating a pedicle from the lip without the lesion to the area of the defect.
- Based on the arterial supply of the labial artery – either superior or inferior
- Ideal for lesions involving 1/3 – 2/3 of the lip
- Lesions must not involve the commissure
Abbé Steps (Cross Lip Flap)

- Surgical Steps:
  - 1. Draw defect on affected lip
  - 2. Draw the flap on the opposite lip to be half the width of the defect
  - 3. Make the full-thickness incision
  - 4. Rotate the flap 180 degrees
  - 5. Suture flap with each individual layer
  - 6. Dress wound to minimize tension
  - 7. Divide pedicle at 14-21 days
Abbé Flap
Abbé Flap
Abbé Flap
Estlander Flap

• Similar to Abbé Flap
• Key is that the Estlander Flap involves the commissure
Estlander Flap

Pictures courtesy of Dr. Patt
Estalander Flap
Estlander Flap
Estlander Flap
Karapandzic Flap

RECONSTRUCTION OF LIP DEFECTS BY LOCAL ARTERIAL FLAPS

By Miodrag Karapandzic, M.D.
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Karapandzic

• Indications:
  - Defects less than $\frac{1}{2}$ of upper lip
  - Defects less than $\frac{2}{3}$ of lower lip
  - Full thickness defects
  - Best suited for rectangular defects of the central lower lip
Karapandzic

• **Key Surgical Steps**
  - Superiorly, continue the incisions into the nasolabial fold
  - Raise only skin and mucosa
  - May selectively cut portions of the orbicularis oris near the original commissure

• **Advantage**
  - Preserves perioral sensation and function of the orbicularis oris by saving CN V₃ and VII

• **Disadvantage**
  - Risk of Microstomia (directly proportional to size of defect)
Karapandzic Flap

PicturesCourtesy of Dr. Moody and Dr. Lies
Karapandzic Flap

Pictures Courtesy of Dr. Moody and Dr. Lies
Karapandzic Flap

Pictures Courtesy of Dr. Moody and Dr. Lies
Nasolabial Transpositional Flap

• Aka Gilles Fan Flap
• Rotation-Advancement Flap
• Rotate the flap around the commissure to create a neo-commissure
• Useful with upper lip lesions
Gillies Flap

• Surgical Steps:
  – 1. For lower lip, start with full thickness incision medial to defect
  – 2. Then, continue the full thickness incision laterally and around the commissure
  – 3. Then, follow the melolabial fold
  – 4. Then, carry the incision down to the superior vermillion border
  – 5. Advance flap and suture individual layers together
Nasolabial Flap
Nasolabial Flap
Radial Forearm Free Flap

- Selected for Large Full-Thickness Defects
- Can be performed with the Palmaris Longus Tendon
- Skin Paddle is used to cover both the lip skin and oral mucosal defect
- Palmaris Longus Tendon is transected within 5 cm of either end of the flap
- Secure the Palmaris Longus Tendon into the Orbicularis Oris Muscle

Pictures courtesy of Dr. Athre
Radial Forearm Free Flap

Pictures courtesy of Dr. Athre
Radial Forearm Free Flap

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Pictures

Thanks to:

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Other pictures and drawings were taken from Baker.
Bibliography