LEUKOPLAKIA

DEFINITION

- Is a premalignant condition where areas of keratosis appear as adherent white patches on the mucous membrane of the oral cavity that cannot be characterized clinically or pathologically as any other disease.
- Leukoplakia may affect other gastrointestinal tract mucosal sites, or mucosal surfaces of the urinary tract and genitals.

CLINICAL TYPES

- Various classifications include

  By Sugar and Banoczy

  - Leukoplakia simple ➔ White slightly elevated homogeneous keratinizing lesion
  - Leukoplakia verrucosa ➔ Verrucous lesion with wrinkled surface
  - Leukoplakia erosiva ➔ White lesion with erythematous areas, erosions and fissures.

  By Pindborg and associates

  - Homogenous
  - Speckled or nodular

Histological Varieties

- Leukoplakia Simplex
- Papillary endophytic
- Papillomatous exophytic

INCIDENCE OF MALIGNANT TRANFORMATION

- 0.13 to 6%

RISK FACTORS

- Trauma
- Tobacco
- Smoking
- Alcohol
- Chronic Candida infection
- Syphilis
- Viruses
TREATMENT

- Remove causative factor
- Decision of elimination or observation of lesion depends on histological nature and site of lesion

HISTOLOGY:

- Mild
- Moderate
- High dysplasia
- Moderate to high dysplasia it is always recommended to eliminate the disease.
- Always eliminate a erythematous leukoplakia, nodular or speckled irrespective of histopath report.

SITE:

- Remove lesions irrespective of histopathology in lesions at:
  - Ventral surface of tongue
  - Floor of mouth.

METHODS OF ELIMINATING LEUKOPLAKIA

Medical

- Local cis retinoic acid and Cap Vit A
- Local Bleomycin
- Fibroblast interferons

Surgical Treatment

- Scalpel excision
- Cryotherapy
- CO₂ laser techniques
- Recurrence rate with all techniques is around 20%

SCALPEL EXCISION

- With few mm margin of normal mucosa around it, leukoplakia undermined upto depth of 2-4mm and excised as a whole.
- Repair of defect caused by excision:
  - Small lesion – primary repair
  - Free mucosal flap.
  - Split thickness skin graft
  - Use of pedicled buccal fat pad graft.
- No special equipment required and whole patch available for Histopath examination
- Bleeding, avoid injury to surrounding structures like Submandibular duct in floor of mouth, contraction and scarring possible during healing
CRYOTHERAPY

- Freeze area with cryoprobe for 1 to 2 min ➔ allow mucosa to thaw ➔ again freeze for 2 min has an advantage as a simple OPD procedure, well tolerated, no bleed, no scar, can be repeated.
- But problem is no surgical specimen available for HPE, inaccurate margins, marked soft tissue edema, delayed necrosis of treated area which sloughs out, Cryotherapy can itself induce dysplasia.

LASER

- Excision or Vaporization.
- ☺ Great visibility as small vessels are cauterized, little contraction or scarring, minimum swelling and inflammation.

OSMF (Oral Sub Mucosal Fibrosis)

SYNONYMS

- Atrophic Idiopathica, Tropica Mucosa, Idiopathica palatal fibrosis, Idiopathic scleroderma of mouth.

DEFINITION

- Chronic disease of unknown origin characterized by fibrous deposition in sub mucosa of pharynx, fauces, palate, cheeks, lips causing trismus.

AETIOPATHOGENESIS

- 40% of oral cancer patients have had OSMF.
- Pindborg told about precancerous nature of lesion.
- Higher incidence of leukoplakia in patients of OSMF.
  1. Hereditary predisposition
  2. Betel chewing, tobacco, spicy, chilled foods etc (chronic irritation)
  3. Poor oral hygiene
  4. Vit A, B Complex and Iron deficiency
  5. Infection (Streptococcal)
  6. Localized collagen disorder
  7. Latest theory ➔ Autoimmune response and antigenic reaction

PATHOLOGY:

Early Stages:

- Mucosa ➔ normal mucosa. Hydropic degeneration in the malpighian layers. Rete ridges are normal.
Sub mucosa ➔ Infiltration of Neutrophils, lymphocytes and histiocytes, proliferation of connective tissue, Increased acid mucopolysaccharide.

**Moderately advanced Stage :**
- Mucosa ➔ Thinning of epithelium, Rete ridges flatten and basal layer proliferation reduced.
- Submucosa ➔ Inflammatory and fibrotic components seen, hyalinization occurs.

**Advanced Stage :**
- Mucosa ➔ Epithelium flattened, Atrophic changes.
- Submucosa ➔ Hyalinised appearance and poor cellularity, less blood vessels, fibrosis around mucous glands, abnormally large amount of debris. Increase in PAS positive material.

**CLINICALLY :**

**STAGE I ➔ STAGE OF STOMATITIS AND VESICULATION**
- Patient complaints of recurrent stomatitis and burning sensation difficulty in eating spicy foods.
- Signs – Vesicles present on palate which rupture with superficial ulcerations. Occasional granular red spots seen.

**STAGE II ➔ STAGE OF FIBROSIS**
- Inability to open mouth, difficulty in blowing and difficulty in protruding tongue. Speech becomes muffled.
- Signs –
  - Blanching of mucosa which becomes white in appearance.
  - Lips and cheeks become stiff, Shortening and disappearance of uvula due to fibrosis.
  - Fibrotic bands from palate to tonsils causes strangulation of tonsils and causes difficulty in visualization of buried tonsil.
  - Atrophy of papillae on dorsum of tongue.
  - Poor orodental hygiene noted
  - The vesicles seen in stage I rupture and heal by fibrosis.

**STAGE III ➔ STAGE OF SEQUELE AND COMPLICATIONS**
- Marked trismus. Difficulty in protruding tongue, difficulty in blowing and muffled speech.
- Signs – signs of stage II plus marked trismus, leukoplakic patches in the mucosa.

**MANAGEMENT**
- Prevention mainstay
- Biopsy to detect early dysplasia
- No dysplasia – long term follow up, if present should be managed like Ca in situ
MEDICAL:

- Hyluronidase, Collaginase, Hydrocortisone, Placental extracts, triamcinolone, fibrinolysin, Gold, Vit A and E, Lycopene drug therapy have been tried recently.
- Placental Extracts consist of amnion, chorion, placental villi, decidua basalis. Contains chorionic gonadotropins, Oestrogen, progesterone, cortisone, hydrocortisone, Vitamins, ACTH like substances, Trace elements etc.

SURGERY:

- Surgical excision of fibrotic bands with:
  - Placement of fresh human placental grafts.
  - Split skin thickness graft
- Above can be combined with bilateral temporalis myotomy and coronoidectomy.
- Daily mouth opening exercises and nocturnal props are used for 4 weeks.
- Excision of fibrotic bands with reconstruction of bilateral full thickness nasolabial flaps.

GRADING OF TRISMUS

- Grade I  – 2.5 to 4cm
- Grade II  – 1 to 2.5cm
- Grade III  – < 1cm
- Grade IV  – Total trismus
- Trismus can be reflex, spastic, inflammatory, Cicatrical, Bony (BRISC)
- Functional counterparts include – Myogenic, Dermogenic, Arthrogenic, Neurogenic, Psychogenic. (DAMP Neuro)

Lip Carcinoma

- Lip begins at the vermillion border with skin and from anterior boundary of oral vestibule. Lips include only vermillion surface or that portion of the lip which comes in contact with opposite lip.
- Develops from 2nd Arch
- Nerve supply –
  - Sensory ➔ Upper lip (Maxillary branch of trigeminal), Lower lip (Mandibular branch of trigeminal)
  - Motor ➔ Facial nerve.
- Blood supply – facial artery via labial artery.
- Covering – Stratified squamous non keratinizing epithelium.

EPIDEMIOLOGY

- Oral malignancies are most common in males of which lip carcinoma is commonest
- Lower lip malignancy – 90%, Upper lip – 4% and commissural is only 6%
M:F = 14:1
SCC commonest followed by BCC (Spindle cell variant (ulcerative or polypoidal) of SCC is found more frequently on lower lip and has poor prognosis)
Non squamous cell Ca more common in minor salivary glands and upper lip > lower lip.

PREDISPOSING FACTORS
- Sun exposure (UV rays) leads to hyperkeratosis (less common in dark skinned individuals as melanin prevents absorption of UV rays.)
- Pipe smokers
- Syphilis
- Poor dental hygiene
- Chronic Alcoholism
- Immunosuppressed patients
- Chronic chelitis
- Senile Elastosis
- Hyperkeratosis

PREMALIGNANT CONDITIONS
- Leukoplakia
- Erythroplakia
- Keratoacanthoma (Elevated umbilicated lesion filled with keratin)

CLINICAL CHARACTERISTICS
- SCC
  - Exophytic is commonest
  - Verrucous rare
  - Ulcerative (Spindle cell Variant)
- A slow growing painless exophytic crusted lesion with variable invasion into underlying muscle. The adjacent lip often shows features of actinic sun damage such as crusting) colour change, thinning of the lip and various associated areas of leukoplakia.
- Carcinoma of upper lip and commisure grows more rapidly and ulcerates sooner and metastasize earlier than lower lip.

SPREAD OF TUMOUR
- Advanced lip cancers can spread along mylohyoid muscle to the floor of mouth and medial pterygoids muscles to pterygoids fossa, to the intrinsic muscles of tongue, perineural spaces of hypogossal or lingual nerve, to MIDDLE CRANIAL FOSSA via mental nerve and inferior alveolar nerve, direct spread to mandible in advanced cases.

PROGNOSTIC FACTORS
- Mandibular invasion or fixation
- Floor of mouth involvement
Spread along mental nerve

**INVESTIGATIONS**

- Biopsy
- Orthopentogram
- CT or MRI for staging
- VDRL

**TREATMENT**

- Early stage – Equally well with surgery and radiotherapy.
- Surgery followed by radiotherapy is recommended for T2 and T3 lesions.

**REPAIR OF LIP DEFECTS**

**LIP SHAVE AND MUCOSAL ADVANCEMENT**

- Leukoplakia or actinic keratosis of vermillion border, are best managed by a lip shave and mucosal advancement.
- Exposed vermillion is stripped from angle to angle and the mucosa lining the lip is advanced to close the defect and resurface the lip margins.
- An application of chloramphenicol ointment prevents scaling of the lip during healing and irritation from the sutures.
- Initial loss of sensation will return over the course of a few months.

**WEDGE EXCISION / W plasty or Half W plasty**

- 5mm margin
- <1/3rd lip involved then only done
- Excised as V and closed directly in two layers
- 1/3rd to 2/3rd defect

**ABBE ESTLANDER FLAP**

- The Abbe-Estlander staged reconstruction requires the development of a triangular full thickness flap from the upper lip. The width of the flap is ½ to 2/3rd the horizontal length of the lower lip defect and same vertical dimensions.
- The flap is pedicled on the labial artery with the full thickness incision extending within 2-3 mm of the vermilion border.
- Abbe’s Flap rotated to reconstruct the defect. Two to three weeks after the harvest of the flap, the pedicle is divided and the final insetting of the flap’s completed.
- Estlander flap is a laterally based Abbe flap that is used when defects affect the commissure.
SO ABBE’s flap for lip to lip reconstruction and ABBE ESLANDER is for commisure reconstruction.

**KARAPANDZIC FAN FLAP (Neurovascular fan flap)**

- The main advantage of the Karapandzic flap is that the nerve and blood supply to the underlying orbicularis oris muscle is retained and the underlying orbicularis muscle is rotated so that a sensate functional lip reconstruction occurs.
- The tissue is rotated from the nasolabial region and this tissue is shifted medially and rotated into the lower lip.
- The lateral incisions of the Karapandzic flap follow the nasolabial skin creases.
- The larger the defect, the tighter the reconstructed lip will be, and thus a certain amount of microstomia can be present following Karapandzic flap reconstruction.
- The restricted oral aperture will stretch gradually over the course of a few months and the stretching can be augmented by physiotherapy.

![Fig. 80.3 Neurovascular fan flap](image)

- >2/3rd Defects:
  - Webster Bernard cheek flap reconstruction
  - Gille’s fan flap.
  - Free Flaps (where adjacent rotated tissue is insufficient)
  - Free flaps can be radial forearm free flap.

**UPPER LIP**

- <1/3rd defects – wedge reconstruction
- 1/3rd to 2/3rd – Perialar crescentric Reverse Karapandzic free flap, Abbe estlander flap
- >2/3rd – Burrow diffenbach.
- Margins of lesion – Smaller lesion margins should be around 5mm whereas larger lesions the margins should be minimum 1 cm.
- Margins checked using frozen sections.

**NECK DISSECTION IN LIP CANCER**

![Image](image)
Squamous cell carcinoma of the lip does not appear to be as lethal as squamous cell carcinoma at other sites in the oral cavity. Neck dissection is generally not performed in the absence of clinically suspicious cervical lymph nodes as less than 5 percent of patients are likely to develop recurrence in the neck following treatment of the primary lesion.

**Indications for bilateral supraomohyoid neck dissection includes:**

- Tumours of commisure of upper lip
- Recurrent tumours
- Aggressive and infiltrative pathology
- Palpable lymph nodes

**RADIOThERAPY TECHNIQUES**

- Cosmetic results usually unsatisfactory.

**EXTERNAL BEAM THERAPY**

- 50Gy in 15 fractions over 3 weeks.

**BRACHYTHERAPY**

- Patients can be treated twice a day for four to five days with a total radiation dose between 40 and 45 Gy. Iridium 192 brachytherapy.

**PHOTODYNAMIC THERAPY**

- Can be used to treat primary lip lesions also with very good response
- A light sensitizing drug such as PHOTOFRIN is given intravenously followed 4 days later by non thermal illumination of the tumour.
- As this treatment works by a cold photochemical process producing apoptosis and vascular shutdown, less scarring should occur compared to radiotherapy and surgery.
- **SURVIVAL RATE** – If tumour thickness < 1cm then 5 yr survival rates are >94%.

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**ORAL CAVITY CANCER**

**EPIDEMIOLOGY**

- Tobacco
- Beetle Nut
- Alcohol
- M > F
- Low socio economic status
Dietary deficiencies of vitamin A, vitamin C, vitamin E, Iron, Selenium, Folate and other trace elements
Viruses – HPV, EBV, HSV
Poor oral hygiene and ill-fitting dentures may also play a role

PRE CANCEROUS LESIONS

- Leukoplakia
- Erythroplakia
- Keratosis Obturans

PATHOLOGY

- Over 90 percent of primary malignant tumours of the oral cavity are squamous cell carcinomas. Approximately 5 percent of tumours are those arising from the minor salivary glands, with less than 1 to 2 percent of tumours being melanoma, lymphoma or sarcomas.

CARCINOMA OF THE TONGUE AND FLOOR OF MOUTH

CLINICAL PRESENTATION

- Carcinoma of the tongue accounts for 35 percent of squamous cell carcinoma of the oral cavity and the floor of mouth accounts for a further 30 percent.
- These tumours may present as ulcerative, exophytic or endophytic tumours and may be associated with pre-existing or adjacent areas of leukoplakia or erythroplakia.
- Usually a raised hard indurated edge.
- Exophytic may be verrucous or cauliflower like.
- MC site – Lateral or ventral surface. (very rarely dorsal surface and tip.)
- Can continue with floor of mouth carcinomas.
- Carcinoma of the floor of mouth normally presents in the anterior floor of mouth or in the lateral floor of mouth between the tongue and the alveolar process.
- Pooling of saliva and carcinogens in the floor of mouth and lateral border of the tongue explain these sites being the commonest sites of oral carcinoma.
- Carcinoma of the tongue appears to have a higher risk of metastases to the regional lymph nodes and subclinical nodal metastases may be found in up to 30 percent of T1 and T2 oral tongue carcinomas.
- Patients with tumour thickness >1cm have 50% risk of nodal metastasis.

SPREAD

- Local
- Lymphatic (Submandibular nodes)
- Distant

INVESTIGATIONS

- Incisional Biopsy
- IMAGING – MR scanning (with T1 and T2 scanning with fat suppression and STIR sequences) is the imaging mode of choice for soft tissue lesions of oral cavity.
Spiral CT
PET for recurrent disease
Orthopentogram for state of dentition and mandibular invasion.
Tc99 bone scans.

MANAGEMENT OF CA TONGUE

STAGE I & II ORAL TONGUE CARCINOMAS

- Extended supraomohyoid neck dissection recommended.

BRACHYTHERAPY

- Brachytherapy in the oral cavity is limited to the anterior 2/3rd of the mouth, as the insertion of the radioactive wires elsewhere is difficult due to access.

STAGE III IV ORAL TONGUE CARCINOMA

- Only 20 to 30% survival rates.
- The functional outcome of reconstruction after subtotal glossectomy often relates to the amount of functioning base of tongue muscle that remains after reconstruction.
- Partial to subtotal glossectomy:
  - Modified radical neck dissection type III of N positive neck
  - Ipsilateral selective level I-IV for No neck.
  - Postoperative radiotherapy of oral cavity and neck.
  - Postoperative radiotherapy for stage I and II tongue carcinoma is also required in the presence of positive surgical margins, extracapsular spread of nodal metastases at neck dissection and the presence of multiple nodal metastases.

CARCINOMA OF BASE OF TONGUE

- The base of tongue appears to be more sensitive to chemo radiotherapy than oral carcinoma.
- As mobility of base of tongue important for speech, deglutition etc its surgical excision is avoided.
- Stage I – II: Radio therapy or wide local excision if exophytic and well-localized via lateral pharngectomy or labio mandibulotomy.
- Stage III – IV: Synchronous Chemo radiotherapy.

SURGICAL RESECTION TECHNIQUES OF TONGUE CARCINOMA

- Transoral resection and primary closure is the treatment of choice for small tumours of the mobile tongue, mainly of the lateral border and floor of mouth.
- When tumours spread from the tongue to the adjacent floor of mouth (or from floor of mouth to the adjacent tongue or mandible), the surgical defect often requires free flap reconstruction to maintain tongue mobility.
- A 1.5 cm margin is marked around the clinical tumour site.
1.5 cm is recommended for tumours less than 4 cm in largest diameter and less than 1 cm thick lesions, although the margin should be increased to 2 cm for larger or thicker tumours.

Confirmation of margins using frozen section

Superficial lesions can be left to granulate and epithelialized by secondary intention, especially if the surgery of superficial lesions is carried out by CO₂ laser therapy.

**RECONSTRUCTION TECHNIQUES**

- Primary closure is adequate for partial glossectomy of up to half of the tongue when there is no resulting tension on the wound or decreased mobility of the tongue.
- Mucosal resurfacing and replacement of tongue volume becomes the method of choice if >1/2 of tongue involved.
- Earlier PMMC was used but were extremely bulky and led to poor tongue mobility.
- The free radial forearm fasciocutaneous flap is a suitable choice of thin flap for resurfacing of the tongue. (Best reconstructive option till now)
- For moderate soft tissue volume replacement – anterolateral thigh flap is used.
- Quality of speech following significant tongue reconstruction is worse 6 to 12 months post op then preop.
- The reconstruction of subtotal glossectomy defects is controversial.
- In appropriate patients, an organ preservation regime using synchronous chemo radiotherapy may be appropriate but overall cure is often reduced as the target volume of tissue to be treated is very large.
- 2 schools of thoughts – one is to replace bulk of tissue with immobile muscle just to press bolus against palate and facilitate oral phase of swallowing.
- The other school of thought, outcome is bad and thus only thin radial forearm flap to replace floor of mouth is sufficient.
- A temporary tracheostomy is necessary for patients with flap reconstruction and nasogastric or gastrostomy tube feeding for up to a week is necessary.
- Brachytherapy cannot be tried near dentate mandible as there is high rates of osteoradionecrosis.

**FLOOR OF MOUTH TUMOURS**

**PRESENTATION**

- The floor of mouth and lingual gutter is one of the most common sites of oral carcinoma due to pooling of saliva and carcinogens in this area
- The tumours are often exophytic and are often found in the region of the opening of the Submandibular ducts.
- In the dentate patient, an endophytic tumour presents as ulceration with craggy borders, often infiltrating into the adjacent mandible.

**INVESTIGATIONS**
Biopsy
CT scan, Tc99 bone scan for spread.

MANAGEMENT

- Superficial lesions – peroral excision and leaving the raw surface to heal by secondary intention.
- However, when such an area is likely to cause fibrosis and contracture due to secondary healing, then reconstruction of the surgical defect with a skin graft or fasciocutaneous free flap should be considered.
- Lesions of the anterior floor of mouth can be excised with a 1-1.5 cm margin.
- It is often necessary to include the underlying sublingual glands in the resection as invasion is usually found.
- Where possible, Wharton’s ducts are preserved.
- In the elderly, bilateral nasolabial flaps may be used to repair small or moderate defects in the anterior floor of mouth. However, this tissue is thick and not as pliable as the radial forearm flap and in the younger patient the scar in the nasolabial fold is more prominent.
- Pedicled flaps like
  - Submental Island flap.
  - Facial artery myomucosal flap proven to be reliable.

MANDIBULAR TUMOURS

PRESENTATION

- In dentate patient – insidiously as loosening of tooth.
- Alveolar tumours often present as discrete cauliflower-like lesions on the attached gingiva.
- In the edentulous patient, the alveolar process is often resorbed and tumours arising from the alveolar crest often invade into the adjacent cortical bone by direct extension.
- The underlying periosteum is, however, a useful barrier to ingress of tumour into the alveolar process of the mandible or maxilla.

INVESTIGATIONS

- Tc99 bone scintigraphy is most sensitive
- CT scan
- OPG (Orthopentogram) (as Routine radiographs are unable to detect initial bone invasion until 30 percent of the mineral has been lost.)
- MRI

MANAGEMENT

- Small tumours of dentoalveolar origin can be considered for a TRANSORAL ALVEOLECTOMY.
2 PATTERNS → Expansive and infiltrative patterns.

In the infiltrative pattern the tumour invades the mandible through defects in the cortical bone or periodontal space. In these cases, tumours are often found to invade the periosteum and the inferior alveolar nerve.

In the expansive pattern there is no tumour invasion in relation to the periodontal space, the neurovascular canal or the periosteum. Thus the expansile pattern can be excised successfully by marginal mandibular resection.

If mandibular involvement is superficial on the alveolar crest, then marginal resection rather than segmental resection of the mandible may be adequate.

Segmental resections requiring osseocutaneous free flap reconstruction have a high degree of morbidity and increased free flap failure compared to soft tissue replacement alone.

Marginal resection can be planned regardless of the dentition, as long as a 1 - 1.5 cm residual bone at the lower border can be maintained to allow structural integrity from the forces of mastication.

Medullary invasion or absence of free margin necessitates Segmental resection.

Reconstruction can be performed using free flaps or plates.

RIM RESECTION OF MANDIBLE

The soft tissue margins of the tumour to be excised are marked using monopolar diathermy. This is an incision taken directly down to the underlying bone.

The periosteum is lifted off the adjacent bone to expose the bone for resection.

The resection margin will usually be superior to the inferior alveolar nerve unless it is involved.

Marginal resection done with soft tissue reconstruction with fasciocutaneous free flaps.

As most of these patients will require postoperative radiotherapy, simple split skin grafts or pedicle flaps in this area lead to a high incidence of bone exposure and osteoradionecrosis following the subsequent radiotherapy.

MAXILLARY ALVEOLECTOMY

A 1.5 cm margin of incision in the mucosa around the palpable tumour is made down to the underlying bone. The underlying bone can be resected with the soft tissue tumour via a segmental resection of the alveolus.

With a small fenestration or alveolectomy procedure posteriorly in the maxilla, the defect can be closed by the use of an advancement flap utilizing the buccal fat pad.

If a more extensive defect is created, then a temporalis flap can be rotated to close over the oroantral communication.

Obturators if used, no further reconstruction required.

BUCCAL CARCINOMA

CLINICAL PRESENTATION AND EPIDEMIOLOGY
More common in elderly males. Depth of invasion/tumour thickness important i.e. patients with tumours less than 6 mm in thickness had a significantly better survival rate compared with those with tumours greater than 6 mm in thickness, regardless of the tumour stage. The buccal mucosa includes all the intraoral mucosal lining of the inner surface of the cheeks and lips. The addition of postoperative radiotherapy in stage III and IV tumours has been shown to produce an increase in overall survival from 40 percent (with surgery alone) to 68 percent after combined therapy.

**TREATMENT**

TI carcinomas of the buccal mucosa can be excised with a suitable margin via a peroral excision. Small defects can be left to granulate, whilst more moderate defects can be reconstructed by advancing the buccal fat pad of tissue. Split skin grafts, Local flaps, such as the facial artery musculo myocutaneous flap, can be used to reconstruct larger defects, fasciocutaneous free radial forearm flap.

If there is any suggestion that the overlying external cheek skin is involved and fixed by the buccal carcinoma, then a through and through defect needs to be created and reconstruction with a bipadded radial forearm flap using skin for external cheek and internal cheek reconstruction.

The buccal mucosa is sometimes affected by verrucous carcinoma, which is a slow growing, well-differentiated carcinoma that is chiefly exophytic but invades locally. It presents as an extensive white warty lesion of the buccal mucosa.

Large area reconstruction can also be done using pedicled temporoparietal facial flap. Superficial but widespread lesions may be suitable for photodynamic therapy.

**CARCINOMA OF THE HARD PALATE**

- Only 2/3rd are SCC.
- Rest mainly salivary gland tumours.
- A submucosal lump is the more common presentation with tumours of salivary gland origin.
- Over 50 percent of lesions extend beyond the anatomical confines of the palate at the time of presentation.

**TREATMENT**

**PARTIAL LATERAL MAXILLECTOMY**

- This surgical approach is tailored for small tumours of the lateral maxillary alveolar ridge and hard palate.
- Margins of at least 1 cm
Gingivo buccal and palatal incisions may be made with scalpel or cautery and carried to the bone of the maxilla. The anterior and lateral walls of the maxillary sinus are then exposed with a heavy periosteal elevator. Providing that the maxillary sinus is not invaded, the maxillary sinus is entered with an anterior osteotomy, inferior to the infraorbital rim.

- The osteotomy is carried through the lateral wall of the maxilla past the area of cancer involvement.
- The hard palate is transected lateral to the midline and into the maxillary sinus, thus avoiding the lateral nasal wall and nasal cavity.
- The soft palate is transected, if necessary, with electrocautery.
- The posterior osteotomy is performed with an osteotome, if possible preserving the posterior wall of the maxillary antrum.
- Stage I tumours excised per orally.
- If preoperative imaging suggests destruction of underlying palatal bone then the fenestration procedure should be performed as part of surgical excision.
- If the preoperative investigations show extension of the tumour into the maxillary antrum or floor of nose, then a formal maxillectomy approach via a Weber-Ferguson cheek flap should be undertaken.

RECONSTRUCTION

- Depends on the size of the defect. Small fenestration cavities can be closed directly by a transposed muscle flap, such as a temporalis flap. Larger defects can be closed using a radial forearm fasciocutaneous flap suspended across the palate using the Palmaris longus tendon. In the edentulous elderly, a simple addition to the denture (to act as an obturator) is satisfactory.

NODAL DISSECTION IN ORAL CAVITY CANCER

- Dissection for NO or limited N+ disease is a level I-III or supraomohyoid neck dissection.
- There may be some fast tracking to level IV in some tongue cancers
- NO disease with requirement of clearance ➔ All stage T3 and many T2 oral cavity carcinomas and carcinomas of the tongue thicker than 3 mm.

SURGICAL APPROACHES TO THE ORAL CAVITY

- Oral cavity tumours can be accessed via peroral, mandibulotomy, lower cheek flap, visor flap and upper cheek flap approaches.

LABIOMANDIBULOTOMY

- A paramedian mandibulotomy utilizes a mandibular osteotomy technique to gain access to the oral cavity or oropharynx.
- A midline incision splits the lower lip and extension of this incision meets the anterior part of the neck dissection incision along an upper neck skin crease
- Mental nerve, which is always found between the roots of the lower first and second premolar teeth.
- In the dentate mandible, the mandibulotomy is often placed between the lower second incisor and the canine teeth. However, when there is not enough space between the roots of the teeth to place the
mandibulotomy, the first premolar tooth is normally extracted and the mandibulotomy performed through this tooth socket.

- The mylohyoid muscle attached to the mandible has to be divided to permit the mandibular swing.

**VISOR FLAP**

- A visor flap, rather than a labiomandibulotomy, should be considered when a bilateral neck dissection performed or a subtotal glossectomy is necessary.
- Utilizes a single transverse skin incision extending from one mastoid process to the other along an upper neck skin crease
- **Main disadvantages** of Visor flap is
  - Both mental nerves need to be resected.
  - Exposure of the retromolar and tonsillar area is not as effective as in a labiomandibulotomy approach.
  - The division of the soft tissues on the lingual aspect of the mandible to drop the floor of mouth into the neck can compromise swallowing and lingual function postoperatively.

**UPPER CHEEK FLAP**

- This requires a Weber-Ferguson incision with either a Lynch or Diffenbach extension.
- Where possible, the posterior aspect of the hard palate and pterygoid plates should be left in situ (if this does not compromise tumour removal) as the origin and insertion of many of the palatal muscles occur in this area.

**RECONSTRUCTION OF THE ORAL CAVITY**

**PRIMARY CLOSURE**

- Primary closure can be used in small defects of the buccal cavity or tongue

**SPLIT SKIN GRAFTS**

- Rarely used now.

**LOCAL FLAPS**

- Vascularized buccal fat pad.
- Transposition flaps of the hard palate based on the greater palatine vessels
- Bilateral nasolabial flaps
- Facial artery based flaps

**DISTANT PEDICLED FLAPS**

- PMMC
- Lattisimus Dorsi Myocutaneous flap

**MICROVASCULAR FREE TISSUE TRANSFER**

- Radial forearm free flap
- Anterolateral thigh flap
- Rectus abdominus flap

Free flap options for mandibular reconstruction include the radius, scapula, ilium and fibula.

OSTEORADIO NECROSIS

- Osseous free flaps are also used as reconstructions in the presence of extensive osteoradionecrosis.