

A DISSERTATION ON

**HEAD & NECK TUMOURS – RESECTION AND
PRIMARY RECONSTRUCTION
MASTER OF CHIRURGIE
(M.Ch.) Degree
BRANCH – III - PLASTIC SURGERY**



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**DEPARTMENT OF PLASTIC SURGERY
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CERTIFICATE

This is to certify that this dissertation entitled “**HEAD & NECK TUMOURS – RESECTION AND PRIMARY RECONSTRUCTION**” submitted by DR.C. EDWIN EMPEROR to the faculty of Plastic Surgery, The Tamil Nadu Dr. M.G.R. Medical University, Chennai, in partial fulfilment of the requirement in the award of degree of MASTER OF CHIRURGIE IN PLASTIC SURGERY, Branch – III, for the August 2006 examination is a bonafide research work carried out by him under our direct supervision and guidance.

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DECLARATION

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This is submitted to The Tamil Nadu Dr. M.G.R. Medical University, Chennai, in partial fulfillment of the requirement for the award of MASTER OF CHIRURGIE, M.Ch., PLASTIC SURGERY, degree Examination to be held in AUGUST 2006.

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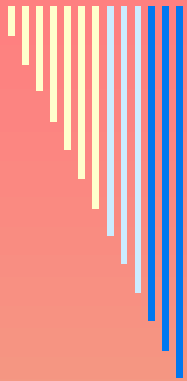
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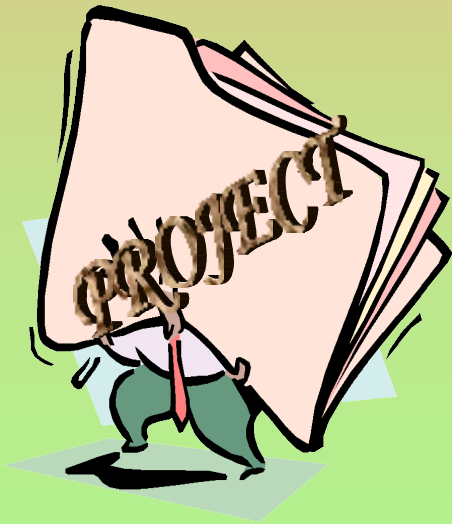
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INTRODUCTION



INTRODUCTION

Reconstruction after extirpation of Head and Neck cancers continue to be a surgical challenge. Majority of patients are debilitated and present with locally advanced disease. Poor long term survival and the need for adjuvant Radiotherapy demand that in most cases the reconstruction should be immediate and single stage, should allow a rapid restoration of function and should have a low morbidity.

Edgerton introduced the concept of immediate reconstruction after resection of Head & Neck Cancers in 1951.

We have reached an era in which we must deal with one stage, recurrence preventing operations and primary reconstructions with respect to surgeons pride but also considering justifiable economic concerns.

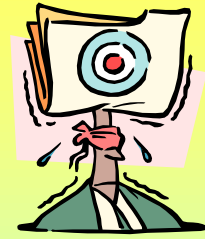
There are now individuals and teams with enormous experience in Head and Neck tumour surgery. Improvements in imaging techniques have resulted in better delineation of tumour extent, better selection of approach and more precise planning of reconstruction. Imaging modalities as axial and coronal two dimensional CT, Interactive three dimensional CT, MR imaging, Angiography, Spiral CT and software packages enabling interactive CT and MRI manipulation allow mock resections to be performed

on the screen.

If ablative surgery has been carried out elsewhere, the ability to use mirror imaging to superimpose the normal side as the deformed side provides real insight into the volume of hard and soft tissue needed to reconstruct the defect.

Approaches to particular types of tumours have been refined and applied consistently. Reconstruction is improving, using combinations of soft tissue and hard tissue replacement with an emphasis on appearance, function and the reduction of complications.

Thus surgery is becoming safer, operations shorter, the results are better both oncologically & reconstructively and boundaries continue to slowly extend.



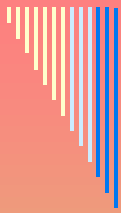
AIMS AND OBJECTIVES



AIM OF STUDY

The main objectives of this clinical study are

1. To discuss the age and sex incidence in our study.
2. To discuss the anatomical site of tumour.
3. To discuss the pathology and grading of tumour.
4. To discuss the type of resection done.
5. To discuss the previous modalities of treatment as chemotherapy and radiotherapy.
6. To study the type of reconstructions done.
7. To study the post operative complications.
8. To discuss the post operative management.



HISTORY

HISTORY

Evolution of Flap

- The history of development of flaps can be divided in the following phases.
- An **early period** spread over various centuries from Susruta 700 B.C. to the First (1917) and Second (1942) world wars.
- The **second period** during 1950s and 1960s – Discovery of regional axial pattern flaps.
- The **third period** during 1970s when muscle and musculocutaneous flaps were developed with simultaneous development of free tissue transfer
- Distinction between Axial and Random pattern flaps were studied elaborately during this period.
- The **fourth period** during 1980s when Fasciocutaneous flaps were scientifically developed and clinically applied extensively. During the same period there was further development and clinical application of wide range of Free flap transfers.
- The **fifth period** during 1990s when Neurocutaneous flaps were described in legs , improving complicated management of lower limb defects.

Early Period

- From 700 B.C. to I & II world wars (1917 & 1942)
- Nasal reconstruction played central role in the evolution of skin flaps

- 700 B.C. – Susruta samhita - ? Graft or Pedicled forehead flap (India)
- 1440 A.D. – Kangra of Kanghiara family from near Pune of India – Pedicle forehead flap for Rhinoplasty. Kakim DinanathKanghiara, the last surviving descendent of the family who secretly performed rhinoplasty, claimed that his family has been practising the art since 1000B.C
- 1595 – Taglicozzi used distally based upper arm flap for nasal reconstruction
- 17th & 18th century – period of decline and neglect of Plastic surgery
- 1797 – Carpus, Graefe & Dieffenbach – Random cutaneous flap
- 1842 – Mutter (USA) – correction of burn scars of the neck with flap
- In the late 19th & early part of 20th century the scope of plastic surgery widened rapidly. It was this period when **PRINCIPLES OF PLASTIC SURGERY** was conceived laying down the **FOUNDATION OF MODERN PLASTIC SURGERY.**
- Pioneers who published papers in this field are GERSUNY – 1887 , MORAX – 1908 , SNYDACKER – 1906 .
- 1913 – Trotter – Delayed flaps.
- Next milestone – Tubing the pedicle of the flap and effectively axialising the flow in the flap
- 1917 – V.P.Filato (Ophthalmologist at Oddessa)

Dr. Hugo Ganzer (Berlin)

Sir. Harrold Gillies (Queen's Hospital, Sidcup, England)

- Captain. Aymard performed tubed flap transfer from shoulder to nose in late 1917.
- Ganzer – Tubed pedicle of arm for repair of palatal defect in 1917.
- **Gillies** - First Tube pedicle in 1917

Second Period :

- The second major period of discovery was in 1950s and 1960s when Axial pattern flap was created.
- McGregor, Owens, Shaw, Wilson, Wookey and Zovickian described variety of flaps from scalp, forehead, neck, chest, supraclavicular area and upper back.
- Pioneers in defining distinction between axial and random pattern flaps were McGregor and Morgan.
- To start with, axial pattern flaps were executed in head and neck region.
- Later on new axial pattern flaps were created in groin, abdomen, thigh and dorsum of foot.

Third Period

- Until 1960s, only skin and subcutaneous tissue were used as flaps.
- In 1968, GER described muscle flap.
- Later, Zukriwich, McCraw, Dibbel, Furlow, Vasconez, Mathes & Nahai, Bostwick, Maxwell, Daniel, Ariyan, Orticochea and Seratin contributed much to

the understanding of blood supply to the muscle and overlying skin, facilitating the use of musculocutaneous flaps as local and free flaps from head to foot.

- In the same period advances in operating microscope, smaller needle and finer sutures made possible the transfer of free flaps.
- First successful reimplantation of completely severed thumb was done by Komatsu & Tamai in 1965.
- Improvement in Microvascular techniques were developed by Buncke et al (1965,1966) and Cobbett (1967) conferring reliability to both Replantation and Free flap surgery.
- Harii et al carried out the first completely successful FREE FLAP in September 1972, followed by Hayhurst in 1973.
- Taylor and Daniele with O'Brien in 1973.
- Acland (1973) and others helped to solve some of the problems of thrombus formation in microvascular surgery.
- Chinese surgeons were doing Hand replantation (1963), 2nd Toe Transfer (1966), and free Groin flap (1973) but these were known to the rest of the world only in 1982 (Chen et al , 1982).

Fourth Period :

- It is the era of Fasciocutaneous flap – 1980s.
- It is the third system of blood supply to the skin consisting of perforators passing

along the fascial septum between certain muscles and spreading out at the level of deep fascia to supply the skin.

- It was first done by Ponten in the leg in 1981.

Fifth Period

- It is the era of Neurocutaneous flap – 1990s.
- Another system of blood supply to the skin.
- Eg: Proximally based Saphenous artery NC flap.

Distally based Sural artery NC flap.



*REVIEW
OF
LITERATURE*



REVIEW OF LITERATURE

FLAPS

Flaps are vascularised tissue possessing an arterial and a venous system. They remain attached to one or other parts of the body (retain their vascularity) during its transfer or transplant from the donor to the recipient area.

Indications:

1. To resurface avascular recipient beds.
 - a. Bare bone, bare cartilage, exposed facial and cranial bones ear, nose and laryngeal cartilages etc.
 - b. Irradiated bed in face
2. Exposed joints or exposed implants.
3. To reconstruct full thickness defects of cheeks, ears, eyelids , lips and nose.
4. For providing durable cover over pressure ulcers in occipital bones
5. For cosmetic reasons. eg. local flaps over face.

Disadvantages:

Flaps are usually bulky, carry hairs in non hairy areas, leave scars over donor area and often require multiple operations to achieve final results.

Blood supply to skin.

Skin receives its blood supply via three different vascular system.

1. Direct cutaneous system.

2. Musculocutaneous system.
3. Fasciocutaneous system.
4. Neurocutaneous system

1. *Direct cutaneous system.*

The direct cutaneous system of vessels (artery accompanied by veins) runs in the subcutaneous fat parallel to the skin, often supplying for a considerable distance. Axial pattern flaps with impressive, length to breadth ratios are based on the direct cutaneous system of vessels.

- a. *Anatomical territory:* Anatomical territory of a vessel is the area occupied by the vessel and its ramifications before anastomosing with adjacent vessels. It is defined on the basis of anatomical dissection.
 - b. *Dynamic territory:* Dynamic territory of a vessel is the area supplied by the vessel after the surrounding anastomosing vessels are divided and ligated. It is always greater than the anatomical territory.
 - c. *Potential territory:* Potential territory is the area of skin which can be raised with an axial pattern flap beyond the dynamic territory as random extension. This requires preliminary delay of potential territory 7 – 10 days prior to raising the flap.
2. *Musculocutaneous system:* The musculocutaneous system of vessels arises as perforators from the arteries supplying the muscle. These perforators run

perpendicular to the skin surface and spread out in the subcutaneous tissue. They freely communicate with the adjacent musculocutaneous perforators. Each perforator supply a small area of skin. Direct cutaneous vessels and musculocutaneous perforators ramify into the subcutaneous tissue and feed the intradermal, subdermal and subcutaneous vascular plexus.

Classification of vascular anatomy of muscles

Dominant vascular pedicle: The pedicle which sustains the circulation of muscle after mobilization as flap is called dominant vascular pedicle. A muscle can have more than one dominant vascular pedicle.

Minor vascular pedicle: Flaps based on minor vascular pedicles are defined as distally based flaps

- a. Type I : One vascular pedicle. e.g : tensor fascia lata.
- b. Type II : One or more dominant vascular pedicle (s) and minor vascular pedicle (s) e.g: gracilis.
- c. Type III : Two dominant vascular pedicles eg: gluteus maximus.
- d. Type IV : Multiple segmental vascular pedicles , each providing circulation to a segment of muscle. eg: sartorius.
- e. Type V : One dominant vascular pedicle and secondary segmental vascular pedicles. These muscles can be elevated as a flap on either dominant or segmental pedicles. eg: latissimus dorsi, pectoralis

major.

3. Fasciocutaneous system:

The fasciocutaneous system consists of septocutaneous perforators which pass up to the surface along the fascial septa between adjacent muscle bellies and then fan out at the level of the deep fascia to form prefascial, intrafascial and subfascial plexus from which branches are given off to supply the overlying skin and subcutaneous tissue. Though there are three different fascial plexus, the blood supply of fascia is essentially from the prefascial plexus. Various communicating vessels connect prefascial plexus to the subdermal plexus. In the skin territory nourished by fasciocutaneous perforators, a flap with underlying fascia will survive to a greater length for a given width, if the long axis of the flap lies in the same direction as the dominant direction of the fascial plexus.

Classification :

These flaps have been classified as type A, B, C and D.

1. *Type A* : A pediculated fasciocutaneous flap dependent on multiple septocutaneous vessels at the base. eg : fasciocutaneous flaps of leg described by Ponten.
2. *Type B* : Type B flap is based on a single , sizeable and consistent septocutaneous perforator. This can be used as a pedicled flap or free flap.eg : medial arm flap.
3. *Type C* . : The Type C flap is supported by fascial plexus that is supplied by multiple small septocutaneous perforators along its length which reach it from a deep artery running along the intermuscular septum. The vascular arrangement

resembles a ladder. This flap is used as island flap or free flap. eg : radial artery forearm flap.

4. *Type D* : The type D flap is an osteomyofasciocutaneous flap. This is an extension of type C flap. The fascial septum is taken in continuity with adjacent muscle and bone which derive their blood supply from the artery running in the septum. eg. radial artery forearm flap and peroneal flap.

4. Neurocutaneous system

- Sensory superficial nerve is supplied by vascular network. The nerve along with vascular network contribute greatly to the vascularisation of skin.
- Neurocutaneous flap can be considered as an Axial pattern flap.
- Greatest advantage is the absence of sacrifice of the main artery.

CLASSIFICATION & CLINICAL APPLICATIONS OF FLAPS:

Flaps are broadly classified into two groups.

1. Pedicled flaps.
2. Free flaps.

1. *Pedicled flaps:*

Pedicled flaps have a pedicle or base which remains attached to one or the other parts of the body during its transfer to the recipient area. Pedicled flaps can be classified as

follows:

- A. Skin flaps
- B. Muscle flaps
- C. Fascial flaps.
- D. Adipofascial flaps
- E. Omental flaps
- F. Compound flaps
 - Fasciocutaneous flaps
 - Myocutaneous flaps
 - Osteocutaneous flaps
 - Osteomyocutaneous flaps.

A. Skin flaps

A skin flap consists of skin and subcutaneous tissue. It can be classified as follows

1. Depending upon the *blood supply* of the flap.
 - a. Random pattern flap.
 - b. Axial pattern flap
 - I. Depending on the anatomy of the pedicle, axial pattern flaps can be classified into
 1. Peninsular flap.
 2. Island flap.

- II. Depending on the site of pedicle, axial flaps can be classified into
1. Proximally based flap.
 2. Distally based flap.
2. Depending on the *location* of the donor site –
- a. Local flaps b) Distant flaps
 - i) Flaps that rotate about a pivot point
 - Rotation flap.
 - Transposition flap.
 - Limberg flap.
 - Dufourmental flap.
 - Bilobed flap.
 - Interpolation flap.
 - ii.) Advancement flaps –
 - Single pedicled advancement flap.
 - Bipedicled advancement flap.
 - Y – V advancement flap / V – Y advancement flap.
 - Cresentric advancement flap.
3. Sometimes flaps are classified and named based on their anatomical location eg. scalp flap, nasolabial flap, medial arm flap, abdominal flap,

subaxillary flap, thigh flap etc.

Random Pattern Flap :

Random pattern flap does not have any cutaneous vessels running along it. It is dependent on the subcutaneous, dermal and subdermal plexus, which are supplied by musculocutaneous perforators. Since their blood supply is random in nature, their length to some extent, depends on the width. Their safe length to width ratio is 1 : 1 except over head and neck where skin vascularity is excellent. Over head and neck the length to width ratio can be kept up to 1.5 : 1 . By increasing the width of the flap beyond certain limits, the length cannot be increased because the surviving length of a random pattern flap depends on the vessel perfusion pressure.

Axial pattern flap:

Axial pattern flaps are used on direct cutaneous vascular system which runs along the length of the flap. They have an impressive dimension which depends on the anatomical, dynamic or potential territory of the cutaneous vessels. They can be subdivided into the following:

Peninsular flap:

Just like a peninsula it is attached to the body on one side at the pedicle. Examples are forehead flap, deltopectoral flap, groin flap.

Island flap:

In island flaps, the pedicle consists of only vessels with out skin bridge. It has greater mobility about its pivot point. Examples are superficial temporal artery island flap with island of scalp for eyebrow reconstruction and neurovascular island flap from the ulnar side of the ring finger to provide sensory cover to the thumb..

Proximally or distally based flaps:

Proximally based flaps have antegrade blood flow while distally based flaps have retrograde blood flow. Proximally or distally based abdominal flaps are used to cover the defects of the fore arm.

Local flaps:

Donor area of a local flap lies adjacent to the recipient area.

i) Local flaps that rotate around a pivot point:

- *Rotation flap:* Rotation flap is a semicircular flap which is rotated around a pivot point till the defect is closed. It is used for triangular defect. If the defect is not triangular it is first triangulated.
- *Transposition flap:* The transposition flap is rectangular in shape and like rotation flap, it is used for triangular defect. If the defect is not triangular, it should be triangulated before planning a transposition flap. The base of the transposition

flap lies towards the apex of the triangle.

- *Limberg flap* : Limberg flap is used for rhomboid defect with 60° and 120° angle. It is like a transposition flap, but in this flap the secondary defect is closed primarily. Hence, the cosmetic result is superior to the transposition flap.
- *Dufourmental flap*: Dufourmental flap is similar to Limberg flap except that it can be constructed for a rhombic defect of any angle.
- *Bilobed flap*: Bilobed flap consists of two flaps – primary flap and secondary flap. The optimal angle between these two flaps is 90 degrees but it may vary from 45 to 180 degrees. The larger the angle, the greater is the chances of dog ear at the point of rotation. The primary flap is planned slightly smaller than the defect and the secondary flap slightly smaller than the primary flap. The secondary flap is made triangular to facilitate closure of the donor defect primarily. Bilobed flap is rotated in such a way that the primary flap covers the defect, secondary defect is closed by secondary flap and the tertiary defect is closed primarily.
- *Interpolation flaps*: The donor area of the interpolation flap does not lie immediately adjacent to the defect (unlike other local flaps.) Hence the pedicle of this flap passes over the intact skin or under the skin (as in subcutaneous pedicled or island flaps). Unlike distant flaps, the donor area lies in the same region. Example: forehead flap for nose defect.

ii. *Advancement flaps*: Advancement flaps directly move forward into the defect without

any rotation or lateral movement. Various advancement flaps are:

- *Single pedicle advancement flap*: Single pedicle advancement flaps are moved forward by
 - i.) Using the property of skin elasticity.
 - ii.) Excising Burrow's triangle on either side of the flap.
 - iii) Pantographic expansion: The base of the flap is kept wide and by making back cut incisions at the base, the flap is moved forward. The defect produced by this movement is closed by medial movement of surrounding skin.

- *Bipedicle advancement flap*: Bipedicle advancement flap is planned parallel to the long axis of the defect. The defect is closed by the lateral movement of the flap and donor defect is closed by split thickness skin graft.

- *V- Y / Y- V advancement flap*.

- *Crescentic advancement flap*: For defects of the upper lip, perialar crescent can be excised to advance the cheek skin into the defect.

DISTANT FLAPS.

When the donor area is situated at a distance from the primary defect i.e over other parts of the body, the flap is called distant flap. Distant flap can be single pedicle flap or tube pedicle flap.

Methods of transfer of distant flaps to the primary defect:

- a. Direct flap transfer.
- b. Indirect flap transfer.

a. *Direct flap transfer:*

Direct flap transfer of distant flap is possible in two ways,

By bringing the primary defects near the flap like transfer of subaxillary flap or transfer of groin flap over hand defect.

By bringing both flap and the defect near each other like cross leg flap.

b. *Indirect flap transfer:*

Indirect flap transfer takes longer time to transfer the flap to the distant site.

i. By wrist carrier.

ii. By migration.

ii. *By wrist carrier:* By wrist carrier, the flap is transferred to a distant site in two stages.

- Stage I : Flap is tubed and end of the tube is attached to the wrist on radial side.
- Stage II : After 4 weeks of attachment on the wrist the flap is divided from its donor site attachment and carried to its destination with its vascular

attachment over wrist.

iii. *By migration*: During transfer of flap by migration – flap is tubed and in each stage, it does not move more than the length of the flap. Usually, it requires multiple stages to reach the destination. The gap after each stage is usually 3 – 4 weeks. The various ways of migration are:

- Waltzing
- Caterpillar method
- Tumbling

PLANNING OF THE FLAP:

- Dimension of tissue loss – skin, muscle , bone and / or mucosa is assessed first.
- Decide about the type of reconstructive procedure required.
- Planning of the flap is done in reverse method.
- A flap should always be planned 10 – 20 % larger than required size.

TECHNIQUE OF THE SKIN FLAP ELEVATION:

- Flaps are handled as gently as possible.
- Flaps are raised at different planes in different areas:
 - Scalp – In loose areolar tissue deep to galea.
 - Chest & Limbs – with deep fascia.

- Abdomen and groin – superficial to abdominal muscles in loose areolar tissue plane.
- Face – Skin with underlying fat is raised without including the muscle or facial nerve.
- Aggressive thinning of subcutaneous tissue from a flap is avoided as it may jeopardise the vascularity of the flap.
- Depending on the size of the defect and available surrounding defect, the donor area is either closed primarily or covered with split thickness skin graft.
- The raw area of the pedicle is covered by split thickness skin graft or tubed to avoid infection.

Immobilization :

All distant pediculated flaps need immobilization in a particular position in post operative period. This is achieved by appropriate splints.

B. MUSCLE FLAPS:

Vascular supply of the muscle is usually consistent in location, the size of the vessel makes it resistant to the effect of radiation and the deepest location makes it resistant to superficial trauma. Therefore, the muscle and musculocutaneous flaps have now become well established flaps in reconstructive surgery.

C. *FASCIAL FLAPS:*

Fascial flaps provide thin, durable cover with minimal donor site morbidity. Fascial flaps are very pliable. Temporoparietal fascial flap (TPF) is an example of fascial flap.

D. *ADIPOFASCIAL FLAPS:*

Fascial flaps, adipofascial flaps and fasciocutaneous flaps are supplied by fasciocutaneous vascular system.

Advantages :

1. Since skin is not incorporated in the adipofascial flap, it becomes more pliable. As a result the dog ears are less pronounced and it can easily be tailored to fit any wound.
2. Adipofascial flaps are turned over and the under surface is grafted. The major vessels of the extremities are preserved.
3. Donor site skin is preserved, thus preventing unsightly donor site defect.

E. *OMENTAL FLAPS:*

As free flap, it can be used to cover distant defects.

G. *COMPOUND FLAPS:*

When two or more different types of tissues are raised as flap, it is termed as

compound flap. Musculocutaneous flap incorporates muscle and skin, osteomyocutaneous flap includes muscle, skin and bone and osteocutaneous flap includes skin and bone.

NEUROSENSORY FLAPS:

Restoration of sensation is desirable in certain circumstances in reconstructive surgery like during resurfacing pressure sores, palm, sole and during reconstruction of penis.

II - Free flaps:

These are completely detached from the donor area before being transferred to the recipient area. The vascular supply at the recipient area is restored by anastomosing the vessels of the flap to the vessels of that area using microvascular technique.

Advantages

- It is an one stage procedure.
 - The patient position in the post operative period is more comfortable.
 - Required period of immobilization is shorter.
 - It provides option for single stage reconstruction with restoration of sensation , incorporation of vascularized bone graft or functional muscle.

Disadvantages:

- It is technically a difficult operation. Specially trained personnel and microvascular set up is required.
- Duration of operation is longer.

Radial artery forearm flap:

Radial artery forearm flap with the lateral and medial antebrachial cutaneous nerve can act as neurosensory flap.

FLAP NECROSIS:

Flap necrosis occurs due to problems in arterial supply, venous drainage of skin or in both.

CAUSES OF FLAP NECROSIS:

- i. Inadequate vasculature
 - Inadvertent damage to vascular pedicle.
 - Damage to vascular pedicle by previous surgery, trauma, radiation or underlying disease (eg. atherosclerosis)
- ii. Tension
 - Inaccurate flap design.
 - Faulty post operative position in case of distant flaps.
- iii. Kinking

- Faulty flap planning
- Faulty post operative position.
- Oedema due to dependent position.

iv. Pressure

- Tight dressing, especially over pedicle.
- Tight subcutaneous tunnel for pedicle.
- Patient lying over flap in post operative period. Mild pressure may cause inadequate drainage. Excessive pressure will occlude the artery too.

v. Haematoma

- Failure to achieve perfect haemostasis.
- Non functioning drain.

vi. Infection

- Aggressive debridement of necrosed tissue.
- Antibiotics.

vii. Rough handling of flap

- Excessive use of forceps or rough manipulations during elevation of flap can lead to necrosis. Rough manipulation may damage the septocutaneous or musculocutaneous perforators.

METHODS FOR ESTIMATING FLAP VIABILITY.

1. Fluorescein Test.
2. Laser Doppler Flowmeter.
3. Photoplethysmography.
4. Transcutaneous PO₂ measurement.
5. Other tests: Measurement of skin temperature, histamine wheal test, radioisotope study,
6. Atropine injected at the tip of flap and watch for signs of absorption.

Usually a pink and brisk dermal bleeding at the time of flap elevation indicates good vascularity.

THE DELAY PHENOMENA:

The delay is a surgical procedure that augments the blood supply of the flap.

Stage I :

Delay the flap by cutting it from three sides and elevating the extra length / full length from the bed.

Stage II :

Elevation of the flap after 10 – 14 days.

IMPROVING COMPROMISED CIRCULATION OF THE FLAP.

1. Find out causes of flap necrosis like haematoma, kinking, necrosis, infection and treat accordingly.
2. Following desperate measures are taken, though these measures do not seem to benefit much.
 - Proper positioning to assist venous drainage.
 - Massage of the flap to improve venous drainage.
 - Intravenous transfusion of low molecular weight dextran in saline solution (500 ml / day for 3 days at a rate of 30 ml / hour) to reduce rouleaux formation.
 - Antiplatelet drug like aspirin (50 – 100 mg once a day) to increase capillary circulation.
 - Cooling of the flap (0^o to 20^o C).

TREATMENT OF FLAP NECROSIS:

In spite of all possible measures, if the flap necrosis occurs, an aggressive approach is preferred for its management. If adequate viable length of the flap is available, the necrosed tissue is excised and reinserted. If this is not possible due to short flap, a more conservative method is required. We wait till flap necrosis is well demarcated and then necrosed tissue is excised. The defect produced due to excision is resurfaced by skin graft / flap later on.

HEAD AND NECK CANCERS

The commonest Head and Neck cancers are Basal Cell Carcinoma and Squamous Cell Carcinoma.

Basal Cell Carcinoma

Basal Cell Carcinoma arises from the pluripotential cells of the basal layer of the epithelium. 93 % occurs in the head and neck region.

Types of carcinoma

- Nodular ulcerative carcinoma.
- Superficial basal cell carcinoma.
- Sclerosing basal cell carcinoma.
- Pigmented basal cell carcinoma.
- Trabecular (Merkel cell carcinoma).
- Adnexal carcinoma.

Histological diagnosis are done by

- Curettage.
- Shave biopsy.
- Punch biopsy.
- Excisional biopsy.
- Deep wedge biopsy.

High risk area for Basal Cell Carcinoma recurrence

High risk areas for tumor recurrence include the centre of the face (periorbital region, eyelids, nasolabial fold, nose - cheek angle), post auricular region, pinna and forehead. Recurring lesions are most common in young women.

Squamous Cell Carcinoma :

Squamous Cell Carcinoma originates from the keratinizing or malphigian (spindle) cell layer of the epithelium.

Types of Squamous Cell Carcinoma

The first is a slow growing variety that is verrucous and exophytic ; though this type may be deeply locally invasive, it is less likely to metastasize. The second type is more nodular and indurated, with rapid growth and early ulceration combined with local invasiveness and increased metastatic tendency.

Surgical excision and Moh's micrographic surgery are the mainstay of treatment. A recurrent lesion is best treated by excision. Radiation therapy can be used effectively in patients over 55 years of age, particularly around the eyelids, nose and lip.

Perineural, lymphatic and mucoperiosteal invasion usually indicate advanced disease and worsen the prognosis for local cure. The patient should be clinically examined for 6 months to 5 years.

Staging of primary carcinoma in the oral cavity

The American Joint Committee on Cancer Staging (AJCC) proposed the following system for staging of primary tumors (T):

T x Primary tumor cannot be assessed.

T 0 No evidence of primary tumor

Tis Carcinoma in situ.

T 1 Tumor ≤ 2 cm in greatest dimension

T 2 Tumor > 2 cm but < 4 cm in greatest dimension

T 3 Tumor > 4 cm in greatest dimension

T 4 Tumor invades adjacent structures (e.g : through cortical bone, into deep muscle of tongue, maxillary sinus, skin.) Superficial erosion of bone / tooth socket by gingival tumor is not sufficient to classify as T 4.

AJCC staging for regional lymph node metastasis (N) from oral cavity carcinoma

N x Regional lymph node cannot be assessed.

N 0 No regional lymph node metastasis.

N 1 Metastasis in a single ipsilateral lymph node ≤ 3 cm in greatest diameter.

N 2 Metastasis in a single ipsilateral lymph node > 3 cm but < 6 cm in greatest dimension. In multiple ipsilateral lymph nodes, none > 6 cm in greatest dimension, or in bilateral or contralateral lymph nodes, none > 6 cm in greatest dimension.

N 2a Metastasis in a single ipsilateral node > 3 cm but < 6 cm in greatest dimension.

N 2b Metastasis in multiple ipsilateral lymph nodes, none > 6 cm in greatest dimension.

N 2c Metastasis in bilateral or contralateral lymph nodes, none > 6 cm in greatest dimension.

N 3 Metastasis in a lymph node > 6 cm in greatest dimension.

AJCC staging for distant metastasis (M) from oral cavity carcinoma.

M x Distant metastasis cannot be assessed.

M 0 No distant metastasis.

M 1 Distant metastasis.

Defects of head and neck are classified as :

Three categories of head and neck defects have been identified by Hanna. The type of defect must be defined before choosing a reconstructive modality.

Class A :

Defects requiring mandatory cover. Class A defects include exposed bone and / or dura, ocular structure, great vessels of the neck, upper mediastinum and lungs, and / or bone (calvarial or facial bones). Coverage of these structures is critical for wound healing and survival, reinforcing the need of a reliable and expedient method. Flap failures may be life threatening in such situations.

Class B :

Defects yielding significant functional deficits. Class B defects include those involving the mucosa and soft tissue of the oral cavity, mandible, lips and cheeks and / or facial nerve. Reconstruction of these structures is not critical for survival : however,

marked functional deficits occur without adequate reconstruction. In particular oral continence must be maintained.

Class C :

Defects yielding significant aesthetic deficits. Class C defects involve specialized structures such as the nose, ears, eyes, hair bearing areas (e.g., moustache, eye brows), and / or external skin contours (without exposed bone). Although loss of these structures may result in a significant loss of cosmesis and quality of life, the timing of reconstruction is less important, than with class A and B defects. Immediate reconstruction is often imperative. Temporized wound coverage with simpler reconstructive methods may be used. Definitive construction may be postponed until adjuvant therapy has been completed.

Reconstructive options for oral malignancies:

Alternatives for surface and volume reconstruction of intra oral defects.

Basal approaches

Secondary healing.

Primary closure.

Grafts

Split thickness skin grafting.

Full thickness skin grafting.

Local flaps

Mucosal flaps.

Lingual flaps.

Palatal flaps.

Regional flaps

Platysma flaps.

Nasolabial flaps.

Temporalis muscle and fascia flaps.

Forehead flaps.

Posterior auricular flaps.

Cervical rotation – advancement flaps.

Sternocleidomastoid muscle flaps.

Trapezius muscle flaps.

Latissimus dorsi muscle flaps.

Pectoralis major muscle flaps.

Free flaps

Jejunum flaps.

Gastro- omental flaps.

Radial forearm flaps.

Lateral arm flaps.

Ulnar flaps.

Scapular flaps.

Groin flaps.

Rectus abdominis muscle flaps.

Dorsalis pedis flaps.

MANDIBLE RECONSTRUCTION

Andy Gump deformity results from loss of height, width and projection of the lower third of the face due to resection of the anterior mandibular arch with anterior and medial deviation of the lateral mandibular segments by the residual mylohyoid muscles and superior displacement by the medial pterygoid, masseter and temporalis muscles. Loss of the anterior mandible results in impairment of oral competence, speech, deglutition and mastication. Loss of support for the hypomandibular complex contributes to aspiration, dysphagia, oral incompetence, and difficulty with mastication.

Conventional techniques for mandibular reconstruction are

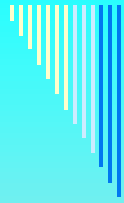
- Free bone grafts.
- Alloplastic materials (metallic implants, metal or Dacron trays packed with cancellous bones).
- Freeze-dried, autoclaved, or irradiated bone grafts.
- Pediculated flaps.

These techniques have poor or, at best, unpredictable results due to variability of the traumatized, irradiated or avascular recipient beds. Reconstruction often requires multiple staged procedures with long hospitalization; patients often succumb before completion of reconstruction.

Disadvantages of reconstruction plates with or without soft tissue reconstruction

are :

- Lack of long term reliability.
- Stress on mandibular fragments may cause screw loosening , plate fatigue and fracture.
- Inadequate soft tissue coverage or radiated tissues result in plate extrusion in many anterior reconstructions.
- No bone stock for osseointegrated dental implants.



MATERIALS AND METHODS



MATERIALS AND METHODS.

Materials

This work includes the study of 50 patients with a diagnosis of tumour of the head and neck region who were subjected to surgical extirpation of the disease either curative or palliative and the defect was reconstructed primarily.

The patients who were admitted in Government Rajaji Hospital, Madurai Medical College , Madurai to Plastic Surgery, Surgical Oncology and General Surgery wards were studied between August 2003 – October 2005.

Methods

The methods include obtaining information from patients, thorough clinical examination and doing necessary investigations for management. All informations were entered in a proforma specially designed for this study.

Methodology

The patient's name,age, sex, symptoms and its duration were obtained. Personal history like smoking, alcohol consumption and diet pattern were obtained.

Patients were examined in detail for secondaries and operability. Basic investigations like blood Hb estimation, urine examination, blood sugar and renal parameters like urea, creatinine were done. Serum protein levels were assessed.

X ray chest and ECG were taken. The extent of the disease is noted by X ray of

the local region, CT scan and MRI as indicated. Tissue diagnosis and its grading were assessed.

Cardiac status was examined by specialist of our institution. Diabetic patients were treated on Diabetologist opinion.

Based on the above investigations, patients were assessed for general anaesthesia and managed surgically. Intraoperative, post operative complications were noted and managed accordingly. All the patients were reviewed in our OP department.

Management

All the patients were informed about the surgical procedures, the nature of the disease, the stage of the disease, the intraoperative, post operative complications and the post surgical adjuvant radiotherapy, chemotherapy according to the nature of the disease.

All the patients were operated under general anaesthesia only by endotracheal, oral or through tracheostomy port.

Preoperative preparations were done and preoperative antibiotics were given.

The patients who were planned for surgery were prepared on the previous day. A detailed informed consent regarding the procedure and its complications was obtained.

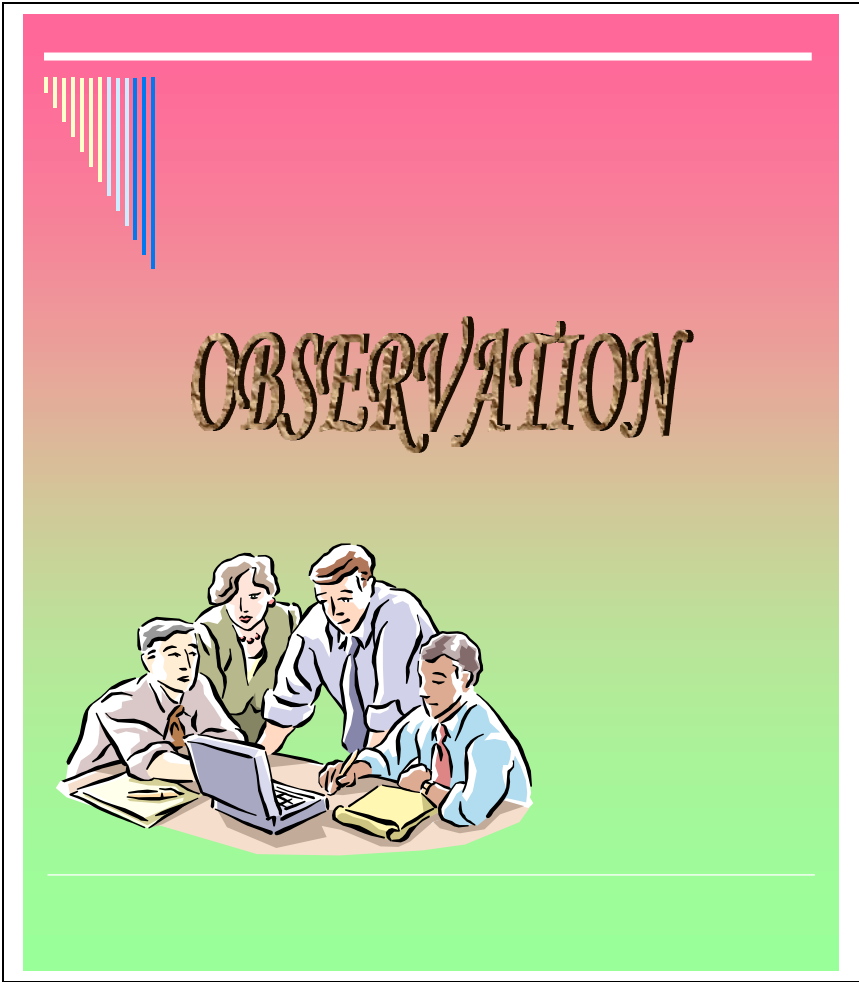
The patients were taken up for surgery in the morning in the respective theatre by the plastic surgeons, surgical oncologist, general surgeons and post excisional defect was reconstructed by the plastic surgeons.

Postoperatively all the patients were managed by plastic surgeons until recovery of the patient. Blood transfusion was given. If necessary patients were observed in the intensive respiratory unit for a couple of days.

After surgery patients were discharged and advised for follow up. If necessary adjuvant treatment was advised.

Follow up

The patients were followed up every fifteen days, one month, two months, three months, six months and one year. The maximum follow up was for two years.



OBSERVATIONS

Total of 1508 cases of cancer were admitted in our hospital.

Out of this 151 cases were head and neck malignancies.

50 of this cases were taken up for study.

Table I

Age Vs gender

Gender	1-15	16 – 30	31—45	46 – 60	61 – 75	> 76	Total
Male	2	2	7	9	3	1	24
Female	1	2	4	14	4	1	26
Total	3	4	11	23	7	2	50

All cases were in the age group from 6 – 80 years.

48 % cases were male and 52 % were female in our study.

Table II

Anatomical sites

Site	No. of cases	%
Scalp	2	4
Forehead	1	21
Eyelid	7	14
Eye	1	2
Nose	6	12
Lip	5	10
Oral cavity	6	12
Cheek	19	38
Submandible	1	2
Neck	2	4
Larynx	1	2
Radio necrosis mandible	1	2

In this study, 4 % of cases had lesions over scalp, 2 % in forehead, 14 % in eyelid, 2 % in the eye, 12 % in the nose, 10 % in the lip, 12 % in the oral cavity, 38 % in the cheek, 2 % in the submandibular region and 4 % in the neck region. Most of the lesions were in the cheek.

Table III

Histo- pathology report

Report	No of cases	%
Squamous Cell Carcinoma	25	50
Basal Cell Carcinoma	14	28
Meibomian Carcinoma	3	6
Haemangioma	2	4
Neurofibroma	2	4
Retinoblastoma	1	2
Papilloma	1	2
Adamantinoma	1	2
Rhabdomyo sarcoma	1	2

In this study 52 % were squamous cell carcinoma, 28 % were basal cell carcinoma, 6% were meibomian carcinoma, 4 % were haemangioma, 4% were neurofibroma, 2 % were papilloma, 2% were adamantinoma , 2 % were retinoblastoma and 2% were Rhabdomyo sarcoma.

Table - I V - Grading

Grade	No. of cases	%
Well differentiated	41	82
Poorly differentiated	9	18

In this study, 82 % were well differentiated and 18 % were poorly differentiated tumours.

Table V - Results

	No. of cases	%
Cure	28	56
Palliative	22	44

In this study, 56 % of cases were cured and 44 % were given palliative treatment.

Table VI Specialist opinion

Speciality	No. of cases	%
Cardiology	15	30
Ophthalmology	6	12
Neurosurgery	2	4
Vascular surgery	2	4
Diabetology & Cardiology	2	4
Cardio – Thoracic surgery	1	2
Radiotherapy	1	2

Dental	1	2
ENT	1	2

Out of 50 cases 34 % had cardiology opinion before surgery. Patients on antihypertensive / anti anginal drugs were examined for cardiac status by clinical outlook, ECG and ECHO.

4 % had diabetologist opinion, 12 % had opthal opinion, 4 % had neurosurgery opinion, 2% had cardiothoracic, 2 % had radiotherapist opinion and 2% had ENT opinion.

Table VII Flap Details

Procedure	No. of cases
SSG	4
Buccal mucosal graft	1
Fore head flap	15
Local – Transposition flap	6
Rotation flap	1
Deltopectoral flap	8
Limberg’s flap	3
PMMC	4
PMOMC	2
Mustarde’s cheek advancement flap	2
Mustarde’s Lid switch flap	1
Island forehead flap, median forehead	1
Radial free flap	1
Slide swing flap	1
Nasolabial flap	1
Double ‘Z’ Rhomboid	1

Superficial temporal artery island flap posterior division	1
Narayanan's Flap	1

In this study, SSG was done for 4 cases, forehead flap for 15 cases, local transposition flap for 6 cases, rotation flap for 1 case, deltopectoral flap for 8 cases, Limberg's flap for 3 cases, PMMC for 2 cases, PMOMC for 2 cases, Mustarde's cheek advancement flap for 2 cases and Mustarde's Lid switch flap, Radial free flap, Slide swing flap, Nasolabial flap, buccal mucosal graft double Z'' Rhomboid, superficial temporal artery island flap from posterior division and Naryanan's flap for one case.

Table VIII Treatment modalities -I

Region	Single flap	Double flap	SSG	Buccal mucosal graft
Scalp	1	0	1	0
Forehead	0	0	1	0
Eyelids	3	1	0	1
Eye	0	0	1	0
Nose	6	0	0	0
Lips	3	2	0	0
Oral cavity	4	5	0	0
Cheek	11	2	1	0
Submandible	1	0	0	0
Neck	2	0	0	0
Larynx	0	2	0	0
Mandible	0	2	0	0
Total	31 (62 %)	7 (14 %)	4 (8 %)	1 (2 %)

In this study 62 % of cases were reconstructed with single flap, 14 % with double flaps, 8 % with SSG and 2 % with buccal mucosal graft.

Table IX Treatment modalities II

Region	SSG	Primary closure	Local flap	Regional flap	Free flap
Scalp	1	0	1	0	0
Forehead	1	0	0	0	0
Eyelid	0	3	1	3	0
Eye	1	0	0	0	0
Nose	0	0	2	3	1
Lip	0	0	0	5	0
Oral cavity	0	0	1	5	0
Cheek	1	3	4	11	0
Submandible	0	0	0	1	0
Neck	0	0	1	1	0
Total	4 (8 %)	6 (12 %)	10 (20 %)	29 (58 %)	1 (2 %)

In this study, 12 % were reconstructed with primary closure, 8 % with SSG, 20 % with local flaps, 58 % with regional flaps and 2 % with free flaps.

Table X

Bone reconstruction

Region	Resection done	Reconstruction done	Not done
Mandible	10	4	6
Maxilla	2	0	2
Occipital bone	1	0	1

For mandible 3 cases underwent reconstruction with rib and one with spacer. The bones were fixed with mandibular plate, miniplate and screws. For maxilla one case underwent medial maxillectomy and the other total maxillectomy and was reconstructed with soft tissue only. For occipital bone, reconstruction with soft tissue cover was done.

Table XI

Reconstruction done in stages

Stages	No. of cases	%
Single stage	24	48
Double stage	23	46
Multiple stages	3	6

In this study, 48 % of cases had reconstruction in single stage, 46 % in double stage and 6 % in multiple stages.

Table XII

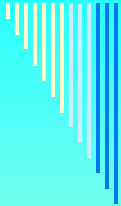
Complications

Complications	Immediate		Late	
	No. of cases	%	No. of cases	%
Orocutaneous fistula	8	16	5	10
Corneal adhesions	0	0	1	2
Loss of vision	0	0	1	2
Flap returned	0	0	1	2
Wound dehiscence	0	0	1	2
Flap dehiscence	4	8	0	0
Wound infection	4	8	0	0
Bone nonunion	2	4	0	0

Delayed healing	1	2	0	0
No complications	34	68	41	82

In this study, 16 % had orocutaneous fistula , 8 % had flap dehiscence at business end, 8 % had wound infection, 4 % had bone nonunion and 2 % had delayed healing as immediate complications. 68 % had no complications.

As late complications, 10 % had orocutaneous fistula, 2 % had corneal adhesions, 2% had loss of vision, 2 % had flap returned, 2 % wound dehiscence and 82 % had no complications.



DISCUSSION



DISCUSSION

The flaps of head and neck is notable for its excellent blood supply and therefore many defects may be reconstructed with local flaps, which have been raised without regard to local patterns of blood supply. Local flaps may exceed the constraints of limited length to breadth ratios usually associated with random flaps.

Approximately, one quarter of childhood malignancies are found in head and neck. The incidence appears to drop slightly with increasing age , being 20 per 1,00,000 population before the age of 5 years and 10 per 1,00,000 population in the following 10 years and gradually increasing.

In our study, the commonest age group is 46 – 60 years, that is 46 % with female dominating 28 % of the total cases.

Upper aerodigestive tract tumours account for 8 % of tumours and they dominate the head and neck malignancies.

In our series, 60 % of the tumours belong to this group. In our institute, 10 % of cases are head and neck tumours.

After Kochers en block resection of primary tumours to include regional

lymphnodes and Criles radical neck dissection and Edgerton's reconstructions, there have been significant improvements in the quality of life of these patients as a result of development of one stage reconstruction with flaps and microvascular free tissue transfers.

The advances in surgical technique have provided well vascularized composite tissue to improve healing, decrease wound complications and improve functional and cosmetic results.

Anatomical sites in our study is consistent with other studies which shows cheek and oral cavity predominates and is the commonest site of tumour in head and neck region.

Histopathology reports state that SCC is predominated in the oral cavity and cheek tumours which is consistent with our study.

Cutaneous malignancy of the head and neck is mainly by the BCC. The actinic rays are the commonest cause for this. 28 % of our cases have BCC.

The well differentiated tumours which are 82 % in our study has broadbands and nests of cells with maturation of cancer cells and have a relatively better prognosis.

The poorly differentiated tumour bear little resemblance to their cell of origin. They have irregular nests of poorly cohesive cells. Keratinization is infrequent. Poorly differentiated cells are composed of sheets of uniform cells which are small cell, large cell or spindle cell types.

Within a single tumour, the degree of differentiation may vary from one area to another.

Since most of the patients are in late forties , 34 % of our patients had cardiologist opinion for their cardiac status to withstand prolonged surgeries.

12 % of cases with lesions in and around orbits were consulted with ophthalmic surgeons during the pre, per and post operative periods.

In treatment modalities, 12 % of our cases were treated with primary closure. Lesions 3 cms and less were closed with primary closure as it is consistent with many studies.

Due to severity of lesions and nature of pathology and as a palliative measure to increase the quality of life 8 % were reconstructed with SSG.

Tracheostomy was done when airway obstruction was anticipated.

20 % of cases had reconstruction with regional flaps and 2 % with free flaps. In advanced centres, with all infrastructure free composite tissue transfer predominates the reconstruction. In our series, regional flaps had yielded good results for healing of wound and functional acceptability of the patients.

In our study the use of local transposition flaps in 6 cases, rotation flaps, slide swing flap, nasolabial flaps each in one case, forehead flaps in 15 cases, Deltopectoral flaps in 8 cases, Limberg's flap in 3 cases, PMMC in 2 cases and PMOMC flap in 2 cases had yielded good results in reconstruction of the post excisional defects.

In our series, 62 % of cases were treated with single flap and McGregors forehead flap was used in 15 cases for cheek and floor of mouth reconstruction. It provides thin pliable tissue for reconstruction of buccal mucosa, floor of mouth and cheek as lining and cover in full thickness defects.

14 % had double flaps, the combination being forehead and DP flap, forehead and PMMC and forehead and local transposition flap in cheek, oral cavity and upper and lower lip reconstructions.

In order to support the floor of mouth, lip, tongue, cheek and decrease functional defects as oral incompetence, difficulties with speech, mastication and swallowing, four cases had undergone mandibular reconstruction with good results. Mandibular plate and

rib graft was used in one case with gratifying result. 2 cases had PMOMC and one with spacer for anterior arch. It reestablished facial balance and symmetry, maintained the height, width and projection of the lower half of the face. Reconstruction of anterior arch prevented posterior and inferior collapse of chin and the Andy gump deformity.

Lateral segment reconstruction prevented deviation of mentum from the midline and restored a symmetric contour to the jaw line.

In our series, 24 cases had single stage, 23 cases had double stages and 3 cases had multiple stages due to complications.

The results in our series are good as 56 % of our cases had curative treatment and 44 % of cases had palliative treatment. The patients were followed up regularly and post operative radiotherapy were advised for the palliative cases.

In spite of all precautions and preventive measures, 16 % of our cases had oro-cutaneous fistulas which were managed surgically. 8 % of our cases had wound infection and 8 % had flap dehiscence at business end and managed accordingly.

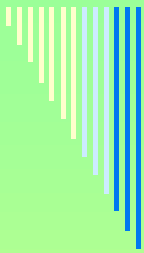


SUMMARY

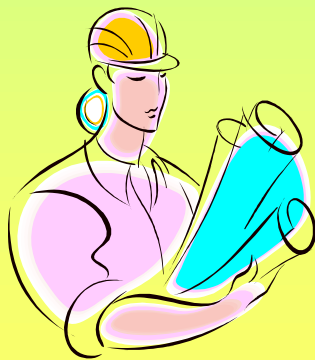


SUMMARY

1. Fifty cases of head and neck tumours were studied.
2. 10 % of tumours belong to head and neck region
3. 48 % were male and 52 % were female in our study.
4. 60 % of cases had upper aerodigestive malignancies.
5. 52 % were SCC, 28 % BCC, 6 % Meibomian Ca in our study.
6. 82 % were well differentiated and 18 % were poorly differentiated tumours.
7. 34 % had cardiologist opinion, 12 % ophthalmic surgeons opinion in our study.
8. Wide excision, composite resections were the modality of treatment in most of the cases.
9. Forehead flap in 15 cases and DP flap in 8 cases were the common flaps used.
10. 62 % single flap, 14 % double flaps, 8 % SSG and 2 % buccal mucosal graft in our study.
11. 8 % had SSG, 12 % had primary closure, 20 % had local flaps, 58 % had regional flaps and 2 % had free flaps in our study.
12. Mandible reconstruction was done for 4 cases in our study.
13. 24 cases had single stage, 23 cases had double stage and 3 cases had multiple stages in our study.
14. 56 % were cured and 44 % had palliative resections.
15. Orocutaneous fistula is the common complication in our study.
16. All postoperative cases were supervised and managed in our ward.



CONCLUSION



CONCLUSION

Collaboration and Communication of multidisciplinary teams have had a profound effect in the treatment of head and neck cancers. The ability to surgically extirpate large tumours without fear of compromising the surgical margins and to provide adequate and reliable reconstruction methods improve local and regional control of disease.

The concept of maintaining quality of life has become particularly important in overall care and treatment of cancer patients. Thus even patients with a very limited life expectancy should be offered resection and reconstruction, if it is expected that their quality of remaining life would be enhanced significantly.

Teams of Oncologic and Reconstructive surgeons provide state of art judgement and skill for patients, even with advanced head and neck malignancies.

Above all ***it upholds the surgeons pride and success in human care.***

DEPT OF PLASTIC, HAND, RECONSTRUCTIVE &

MICROVASCULAR SURGERY.

GOVERNMENT RAJAJI HOSPITAL, MADURAI MEDICAL COLLEGE

HEAD – NECK TUMOURS → PRIMARY RECONSTRUCTION
AFTER RESECTION.

Prof. Dr. *V.Narayanan* M.S.,M.Ch.,

Addl. Prof. Dr. *A.Charles*. M.S.,M.Ch.,

2003 - 2006

Name: Ward :

Age : Address:

Sex :

Occupation:

I.P. No.

D.O.A DIAGNOSIS.

D.O.O

D.O.D

HPE

C/ O

Origin:

H/ O

- Trauma / Burns / Pain / fever / Purulent discharge / delayed healing / Smoking / Tobacco chewing

General Examination:

- Anaemia / Avitaminosis / Icterus
- pedal edema / Generalised lymphadenopathy

Investigations:

Basic Investigation in Blood, Urine, X ray, CT Scan, HPE

Ulcer: / Tumour.

Size, shape, number, site, discharge, floor, edge, margin, surrounding area.

Operative Notes / Findings / Defect / SSG / Local Flap / Distant Flap.

Post operative follow up:

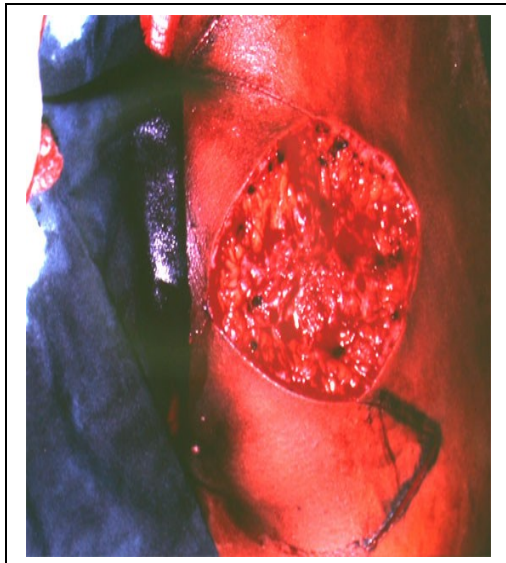
Complications :



RESULTS



SOFT TISSUE SARCOMA – DOUBLE Z RHOMBOID



CISI



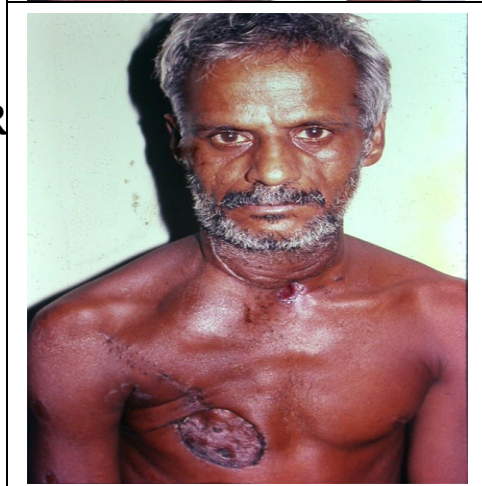
URE

PEC. MAJOR MUSCULO CUTANEOUS FLAP

1. FOR SECONDARIES NECK



NX R



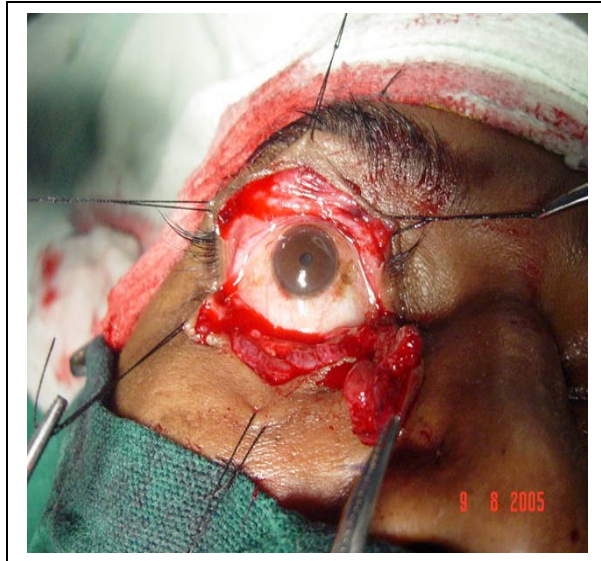
**CA CHEEK FORE HEAD AND
PMMC FLAP**



**BCC NOSE RADIAL FOREARM
FREE FLAP**



MEIBOMIAN CARCINOMA - MUSTARDE'S LID SWITCH



EXCI



B.C.C. – MUSTARDE’S CHEEK ADVANCEMENT



CA CHEEK - FORE HEAD FLAP

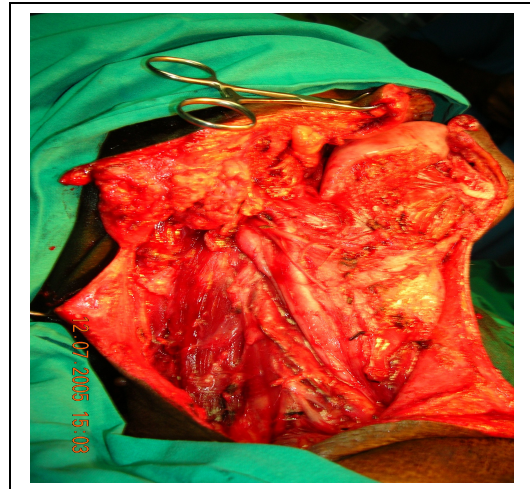




B.C.C. EXCISION & SLIDE SWING FLAP

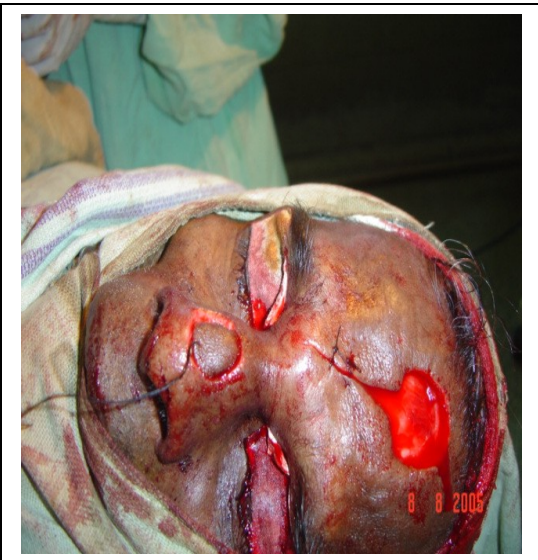


CA ALVEOLUS WITH SEC NECK - DP FLAP





B.C.C. NOSE – ISLAND FORE HEAD FLAP



S.C.C. SCALP – TRANSPOSITION FLAP



B.C.C. LINEAR ADVANCEMENT



MEIBOMIAN CA
MUSTARDE'S LID SWITCH
& NASOLABIAL FLAP





CA – MAXILLA FORE HEAD FLAP



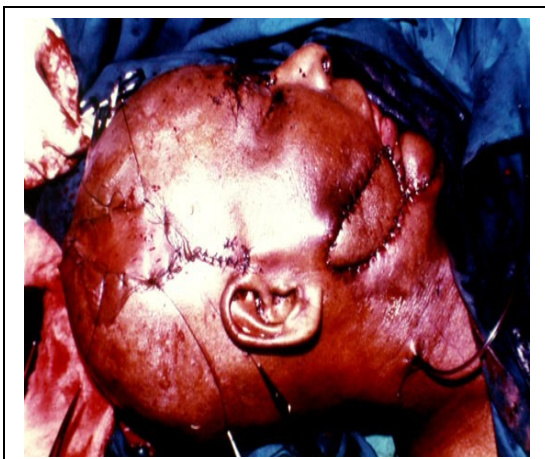
B.C.C - NASO LABIAL FLAP



CA FLOOR OF MOUTH - PMMC FLAP



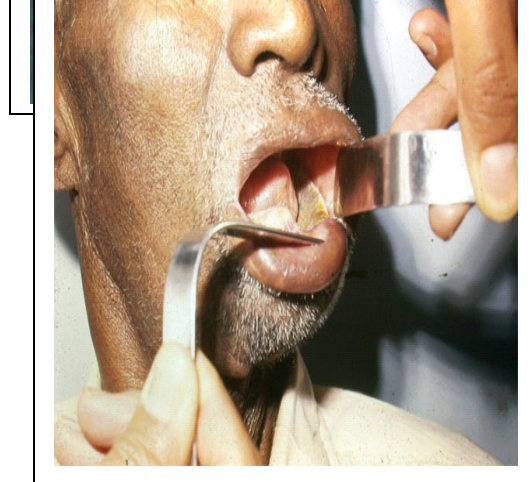
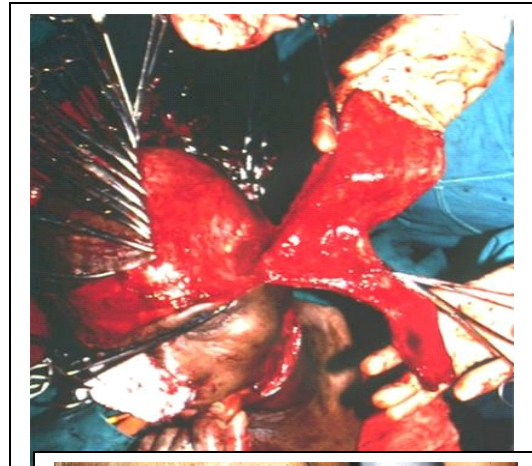
RADIATION NECROSIS SUPERFICIAL TEMPORAL ARTERY ISLAND FLAP



B.C.C. LIP - SLIDE SWING FLAP



CA CHEEK - NARAYANAN'S FLAP



ADAMANTINOMA RESECTION & MANDIBLE RECONSTRUCTION WITH PLATE

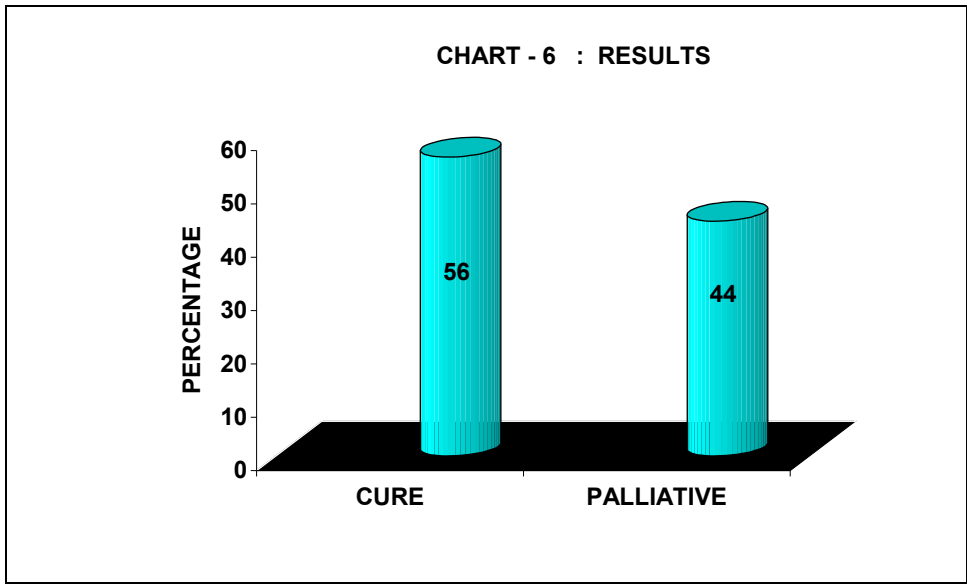
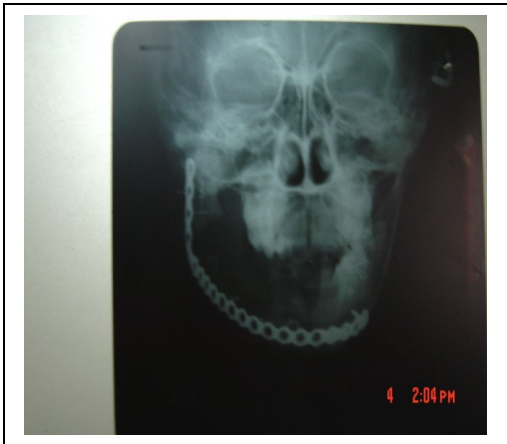
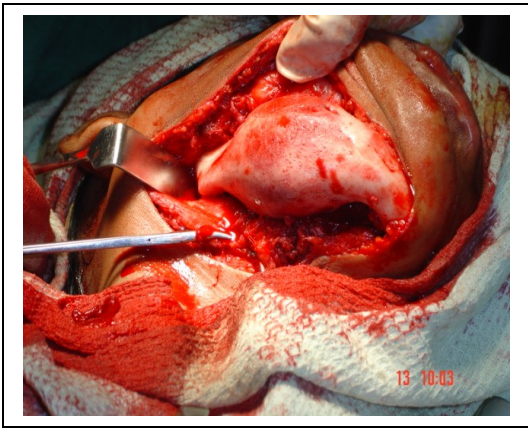


CHART - 2 : GRADING

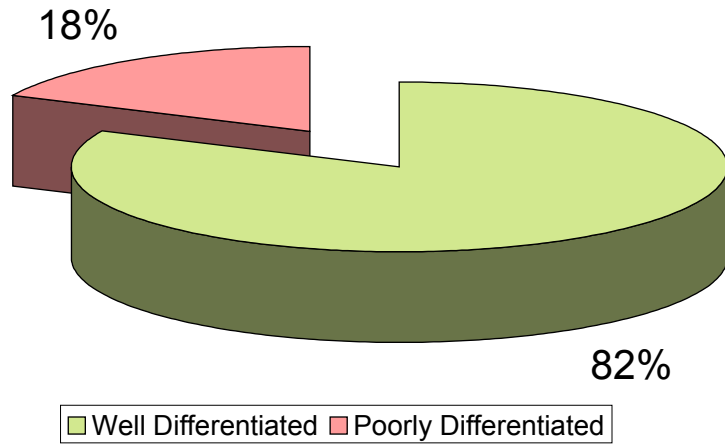
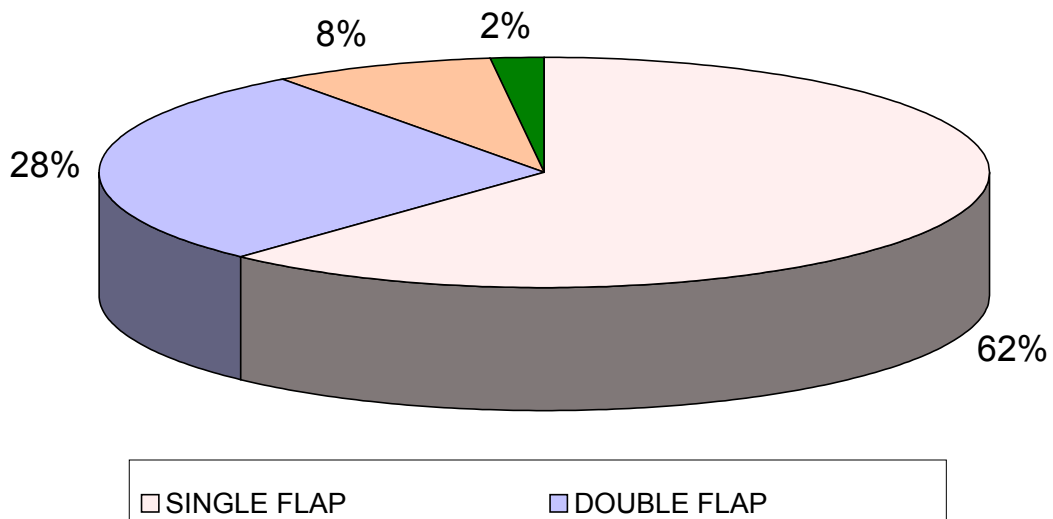


CHART - 3 : TREATMENT MODALITIES



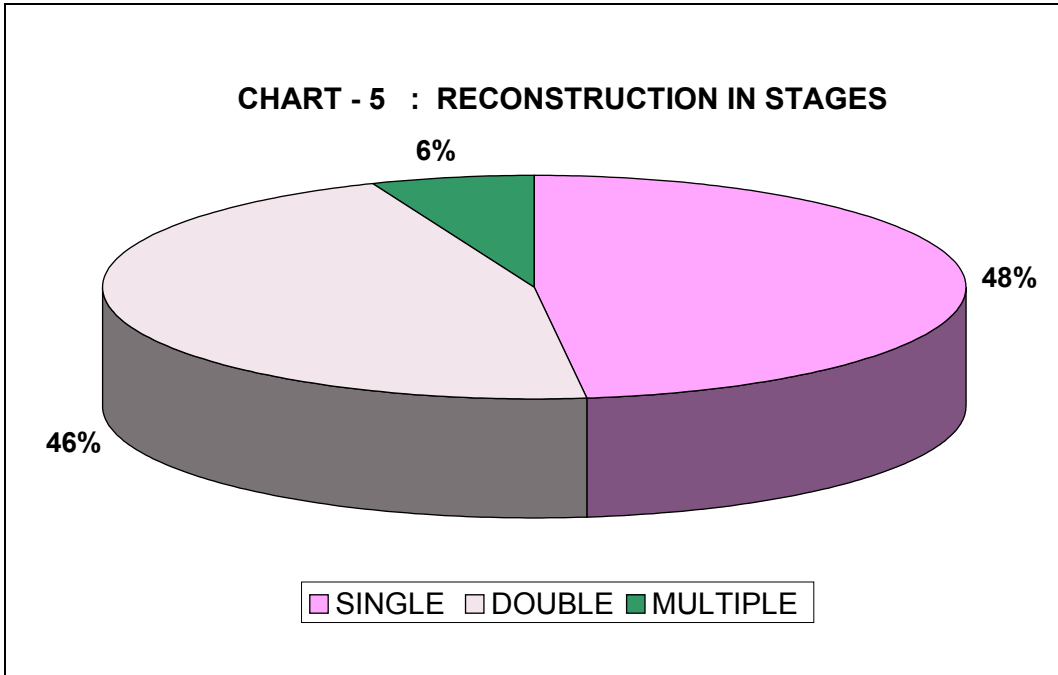
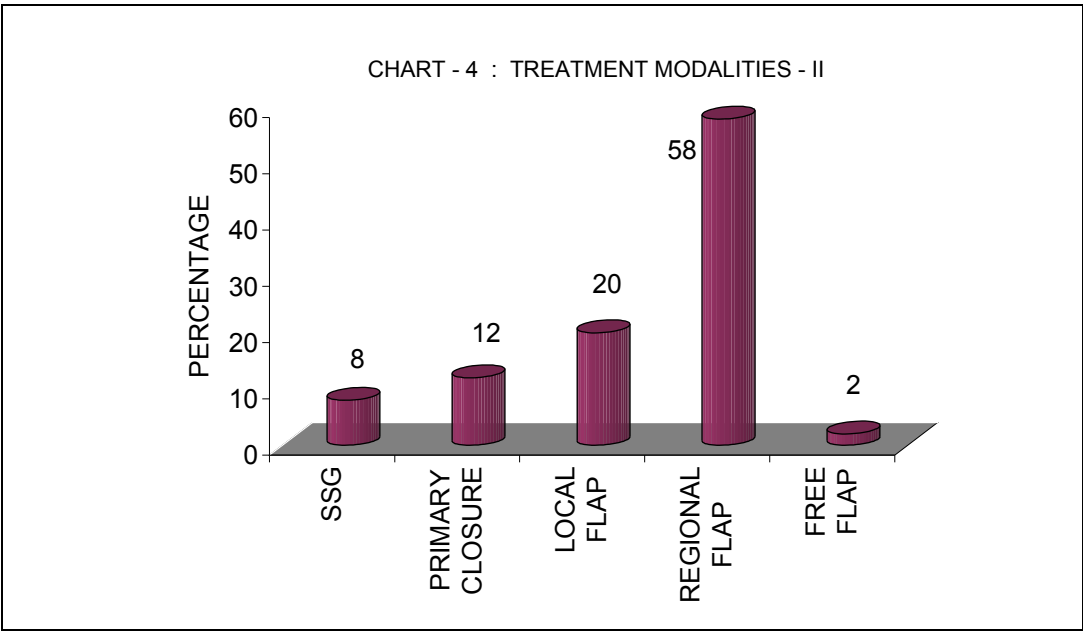
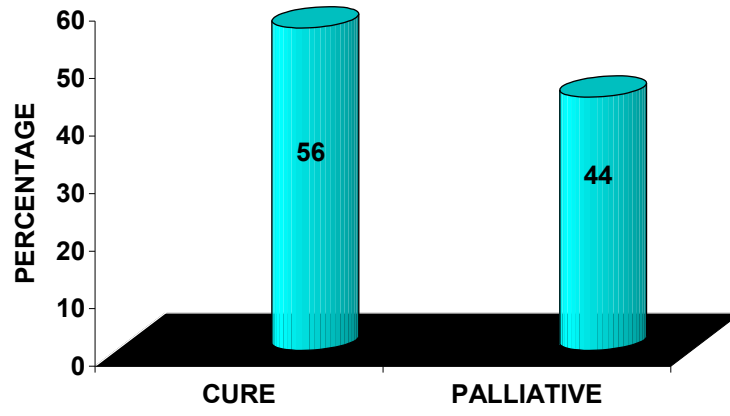


CHART - 6 : RESULTS





BIBLIOGRAPHY



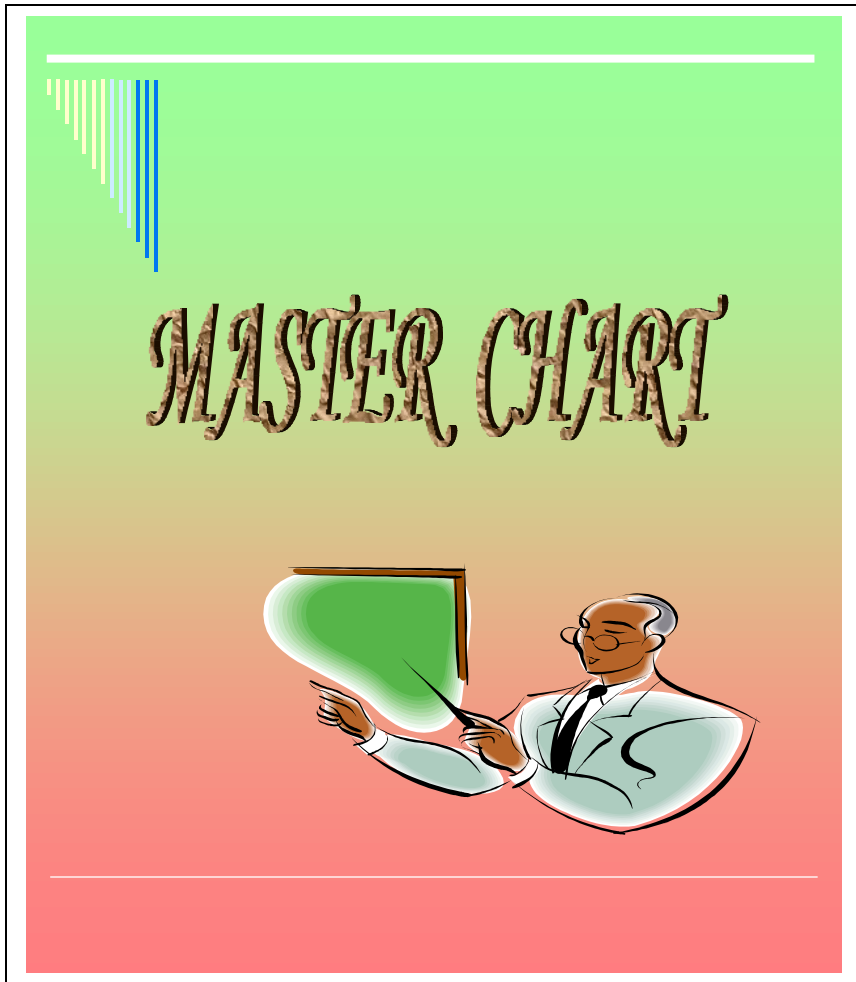
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ABBREVIATIONS

BCC	Basal Cell Carcinoma
Ca	Carcinoma
Cardio	Cardiology
DP	Deltopectoral
Diab	Diabetology
FL	Flap
LT	Left
PMMC	Pectoralis Major Myocutaneous
PMOMC	Pectoralis Major Osteo Myocutaneous
PS	Plastic Surgery
PD	Poorly Differentiated
RND	Radical Neck Dissection
RT	Right
Rec	Recurrent
Sec	Secondaries
SCC	Squamous Cell Carcinoma
SSG	Split Skin Grafting
SO	Surgical Oncology
S	Surgery
WE	Wide Excision
WD	Well Differentiated



STAGE –I

1	2	3	4	6	7	8	9
Name	Age/Sex	Unit	I.P.No.	D.O.A	D.O.O	D.O.D	Diagnosis
mmulu	60 / F	S.O	132180	25.4.04	3.7.04	15.7.04	BCC
ellaiammal	63 / F	S.O	261049	30.3.04.	28.4.04	18.5.04	Ca Upper lipRt& Rt alveoli
etchiammal	45 / F	S.O	258999	23.3.04	3.4.04	13.4.04	BCC
akshmi	60 / F	S.O	275170	3.6.04	5.7.04	14.7.04	Rec Meibomian Ca Lt upper eye lid.
ellaiammal	50 / F	S.O	275746	1.7.04	3.7.04	29.7.04	Ca Rt cheek
egam beevi	56 / F	S I	285737	2.7.04	28.7.04	26.8.04	Ca lower lip
hinnammal	60 / F	S II	283215	4.7.04	29.7.04	28.8.04	Ca Rt upper lip
ellammal	50 / F	S.O	284459	15.7.04	2.8.04	4.11.04	Ca floor of mouth
agalingam	67 / M	S II	289397	26.7.04	12.8.04	14.9.04	Ca Rt nasal cavity & Rt maxilla
amayee	60 / F	S VI	287293	6.8.04	19.8.04	8.9.04	Ca alveolus & floor of mouth Lt
aroja	50 / F	S.O	285498	10.8.04	24.8.04	10.9.04	Sec. metastasis ly.node Lt skin infiltr.
anohar	45 / M	S I	292871	1.9.04	24.9.04	25.10.04	Ca Rt buccal mucosa
uppusamy	50 / M	S VI	298693	6.9.04	23.9.04	27.9.04	Ca Rt cheek with angle of mouth
alaisamy	32 / M	S V	293462	12.10.04	3.11.04	16.11.04	Ca scalp, occipital bone infiltration
alanivel	80 / M	S VI	309676	19.10.05	9.11.04	26.11.04	Ca Rt cheek
alliammal	45 / F	S III	342653	23.10.04	08.11.04	22.11.04	Ca lower lip
atchiammal	45 / F	S O	274212	20.10.04	10.11.04	20.12.04	Ca cheek Rt
umar	62 / M	S O	308257	14.10.04	19.11.04	02.04.05	Ca cheek with floor of mouth
ubramani	45/ M	S I	310425	06.11.04	05.12.04	22.12.04	Ca cheek Rt
aher john	55 / F	S I	310225	01.12.04	13.12.04	29.12.04	BCC Rt face – Infra orbital region
ajan	15 / M	S O	323652	24.12.04	10.01.05	25.01.05	Adamantinoma mandible
yyanar	60 / M	S II	324316	02.01.05	13.01.05	23.01.05	BCC Lt Zygomatic region
aj kumar	43 / M	S O	326112	04.01.05	24.01.05	04.02.05	BCC Lt infra orbital region
akshmi	80 / F	S O	329256	04.02.05	28.02.05	12.03.05	BCC Nasolabial region
aya lakshmi	18 / F	S O	318477	20.12.04	10.01.05	20.02.05	Rec. Neurofibroma Lt upper eye lid
oundar raj	35 / M	S O	329269	11.01.05	02.02.05	14.02.05	SCC Rt side – neck with secondaries neck
artin	60 / M	S O	332969	12.02.05	02.03.05	12.04.05	Rec. Meibomian ca Lt upper eye lid
zhagar	50 / M	SO	332162	01.04.05	20.04.05	12.05.05	Ca cheek Rt osteo radio necrosis mandible
uniyandi	15/ M	S IV	344648	20.04.05	24.04.05	05.05.05	Ca cheek Rt
aliammal	50 / F	S O	346505	10.04.05	27.04.05	06.06.05	Ca cheek Rt
andiammal	57 / F	S IV	352398	02.05.05	17.05.05	28.05.05	BCC Lt side face
ubramani	60 / M	S O	353241	02.05.05	28.05.05	15.06.05	Ca cheek Lt side
ookan	60 / M	S VI	354169	04.04.05	03.05.05	24.05.05	Ca cheek

Aliammal	52 / F	S I	325341	01.06.05	15.06.05	12.07.05	Ca lip lower – Rec	-
Agammal	55 / F	S I	395421	01.06.05	22.06.05	24.07.05	Ca cheek Lt	-
Mudhavalli	56 / F	S V	361644	05.06.05	29.06.05	14.07.05	Soft tissue sarcoma neck	-
Andi	60 / M	S O	395421	04.07.05	01.08.05	02.09.05	Ca cheek oper. fungat N Rt subman	-
Airavan	65 / M	S O	372904	24.07.05	08.08.05	25.08.05	SCC dorsum of nose	C
Ankar	19 / M	PS	286675	27.07.04	30.07.04	10.08.05	Plexiform neurofibroma face	C
Amma	6 / F	SO	286672	14.01.04	26.02.04	15.03.04	Retinoblastoma Lt eye	C
Aakash	35 / M	PS	273452	17.11.04	29.11.04	14.12.04	BCC Lt ala of nose	-
Kennedy	50 / M	OPHTH	273002	27.06.04	28.06.04	29.06.04	Papilloma Lt upper eye lid	C
Ahalingam	45/M	OPHTH	136896	10.08.05	24.08.05	30.08.05	Meibomian Ca Lt upper eye lid	C
Chinnu	70/M	S VI	381665	01.09.05	29.09.05	15.10.05	BCC scalp	M
Akshammal	70/F	SO	384781	20.09.05	30.09.05	30.10.05	Ca cheek Rt oro cutaneous fistula	C
Geetha	45/F	SO	243921	12.09.04	20.09.04	04.10.04	BCC nose	-
Ariammal	65/F	S V	392524	01.10.05	12.10.05	24.10.05	BCC forehead	C
Akshmi	19/F	PS	395252	09.10.05	12.10.05	20.10.04	Haemangioma Rt side of face	V
Prishnan	24/M	PS	349253	05.02.05	07.02.05	17.03.05	Haemangioma Rt cheek	V
Amuthai	60/F	S II	349256	01.10.05	17.10.05	28.10.04	BCC nose	C

STAGE –II

11		12	13	14	15	Reconstruction
Pathology		Site of lesion	Size	Surgery done	Defect	
Report / grading			cm		cm	
	W D	Lower eye lid Rt	2x2	W E - Rt lr eye lid	Whole lr eye lid	Nasolabial flap
	P D	Rt upper lip & alveolus	7x5	W E- medial maxillectomy	Loss of upper lip & medial maxilla	PMMC
Med BCC	W D	Root of nose, med canthus Rteye	3x2	WE oblique median forehead fl	4x3, skin, SC, periosteum	Oblique media
Median Ca	W D	Lt upper eye lid	3x2	WE, Mustarde lid switch fl, Naso labial flap- sup based	Whole of Lt upper eyelid	Mustarde lid s Sup. based nas
	P D	Rt cheek	6x4	WE	8x5 Rt cheek	Fore head fl &
	W D	Whole lower lip	4x2	WE	6x4 lining & cover	Fore head fl fo cover
	W D	Rt upper lip	3x2	WE	5x4 lining & cover	Forehead fl fo skin adj for co
	P D	Floor of mouth	4x3	WE, Rt hemimandibule. RND.	6x4 Rt hemimandible	PM osteomyo
Med Ca	P D	Rt nasal cavity, maxilla lat wall of nose	5x4	WE, Rt maxillectomy	8x7 Rt maxilla	Forehead fl

	W D	Lt alveolus, floor of mouth	2x3	WE, Lt hemi mandibulectomy, Supraomohyoid block diss.	4x5lr lip, floor of mouth, Lt hemi mandible	DP & fore head
	P D	Lt neck	15x10	WE , RND	20x15 exposing carotid V	DP flap
	P D	Rt buccal mucosa	1x2	WE , local adjustment	3x3 Rt cheek	Local transpos
	W D	Rt ankle of mouth	3x2	WE	4x4	Fore head fl
	W D	Scalp, occipital bone infiltration	4x5	WE , Rt sup temporal A based transposition fl	6x7 outer table of occipital bone	Sup temp. A b transposition f
	WD	Rt cheek	4 x 5	WE , fore head fl	7 x 8	Flap excised d
	W D	Lr. lip	3x3	WE ,DP fl	4.5x 4.5 lower lip	DP fl
	P D	Rt cheek	4x5	WE , cheek adjustment	6x7	Cheek advanc Forehead fl
	W D	Floor of mouth & cheek		WE, hemimandibulectomy, PMOMCF, DP cover 5 th rib	7x10	PMOOMCF ,
	W D	Rt cheek	4x3	WE , forehead fl	6x5	Forehead fl
	W D	Lr eyelid with IO region	1x1.5	WE, Mustardes ck advancem fl.	medial 2/3 lr eyelid full thickness	Mustardes ck a
ntinoma	W D	Mandible	5x3	WE, hemimandibulectomy,	7x5	Transposition mandibular pla
	W D	Lt zygomatic reg	3x2	WE	5x4	Linear advn
	W D	Lt infra orbital reg	2x1	WE	3x2	Nasolabial fl
	W D	Rt naso labial reg	3x3	WE	4x4	SSG
rbroma	W D	Lt upper eye lid	3x3	WE	4x4	Buccal mucosa
	P D	Lat asp of neck Lt	2x1.5	WE ,	4x3	Double Z Rho
nian Ca	W D	Lt upper eyelid	0.5	WE	1	Primary closur
	W D	Lt cheek	7x5	WE, Superficial temporal artery flap	10x5	Superficial tem island flap
	W D	Rt cheek	4x5	WE, hemimandibulec.FND	7x8	PMMC , DP
	W D	Rt cheek	4x3	WE, suprahyoid resection & hemimandibulectomy	7x6	Forehead fl
	W D	Lt side face	1.5x1.5	WE Limberg fl	2x2	Limberg fl
	W D	Lt cheek	3x1	Composite excision	5x3	Forehead fl for Skin – primary
	W D	Rt cheek	3x4	WE	5x6	Forehead flap
	W D	Lower lip	4x5	WE, Ant seg of mandible	6x7	DP fl , K wire,
	W D	Lt cheek	4x2	BD , WE fore head flap	7x5	Forehead fl
	W D	Lt cheek	3x2	WE, Limberg fl	5x4	Limberg fl
	W D	Rt submandibular reg	6x4	Composite R, RND , DP fl	10x7	DP fl
	W D	Nose	1x0.5	WE, Island forehead fl	2x1.5	Island midline
ofibroma	WD	Face. Plexiform neurofibroma	15x20x7	Reduction	15x20x7	Primary closur
blastoma	PD	Lt eye	10x7x5	Enucleation	5x4x3	Inlay skin graf
	WD	Lt ala of nose	2x1	Ex & Limbergs flap	3x2	Limbergs flap
ma	WD	Lt upper eye lid, lat. canthal reg	2x1	Ex & Primary suturing	2x1	Primary suturi
nian Ca	WD	Lt upper eye lid	2x1	Ex & Mustarde lid switch op	2.5x1	Mustarde lid s

	WD	Scalp	7x5x	WE & SSG	9x7	SSG
	WD	Cheek Rt	4x5	WE, Hemimandibulectomy, Radical neck dissection	7x8	Forehead flap
	WD	Dorsum of nose	4x3	WE	5x4	Radial forearm
	WD	Forehead	5x4.5	WE	6x5.5	SSG
angioma	WD	Face Rt side	3x2	Excision	3x2	Primary closure
angioma	WD	Rt cheek	3x2	Excision	3x2	Primary closure
	WD	Dorsum of nose	2x2	Excision	2.5x2.5	Slide swing flap

STAGE –III

	17	18	19	20	21	22	23
1	+++	Nil	Nil	Nil	Nil	Nil	Nil
2	+++++	Nil	Nil	Nil	Nil	FD	Nil
3	+++++	Nil	Nil	Nil	Nil	FD	Nil
4	+++++	Nil	Nil	Corneal adhere	Nil	FD attemp	Nil
5	+++++	Nil	Nil	Nil	Nil	FD & in	Nil
6	+++++	Nil	Nil	Nil	Nil	FD & in	Nil
7	+++++	Nil	Nil	Nil	Nil	FD & In	Nil
8	+++++	Nil	OC fistula Non union rib- mandible	Orocuta fistula	+	FA	Nil
9	+++++	Nil	delayed healing	Nil	+	FD	Nil
10	+++++	Nil	Oro cuta fistula	Nil	+	FA	+
11	++++	Nil	Nil	Nil	Nil	Nil	Nil
12	+++++	Nil	oro cuta fistula	Nil	Nil	fistula cl.	Nil
13	+++++	Nil	Nil	Nil	Nil	FD & in	Nil
14	+++++	Nil	Nil	Nil	Nil	Nil	Nil
15	+++++	Blg fl.	Orocuta fistula	Orocuta fistula	+	Nil	+
16	++++	Nil	Marginal necrosis, fl detachment	Fl returned	+	Fl. returned	RT
17	+++	Nil	Fl. dehiscence	--	+	WE , FH fl	+
18	+++++	Nil	PMMC , rib necrosis	Orocuta fistula	--	Fl adjust	--
19	+++++	Nil	Nil	Nil	--	Div & insert	--
20	++++	Nil	Nil	Nil	--	Nil	Nil
21	+++++	Nil	Nil	Nil	--	Nil	Nil
22	+++++	Nil	Nil	Nil	--	Nil	Nil
23	+++++	Nil	Nil	Nil	--	Nil	Nil
24	+++++	Nil	Endophthalmitis	Loss of vision	+	Excision	+
25	+++++	Nil	Nil	Nil	--	Nil	Nil
26	+++++	Nil	Nil	Nil	--	Nil	Nil
27	+++++	Nil	Nil	Nil	--	Nil	Nil
28	+++++	Nil	Nil	Nil	--	FD,insert	Nil

29	++++	Nil	Nil	Nil	--	FD , insert	Nil
30	+++	Nil	OC fistula closure & fl adjustment	Nil	--	OC fistula adj	Nil
31	++++	Nil	Nil	Nil	Nil	Nil	Nil
32	++++	Nil	Nil	Nil	Nil	Nil	Nil
33	++++	Nil	Nil	Nil	Nil	Nil	Nil
34	++++	Nil	Fl necrosis distal end	Orocuta fistula	Nil	Fl. adjustm	Nil
35	++	Nil	Orocuta fistula	Nil	Nil	Fl. adjustm	Nil
36	+++	Nil	Wound inf, debride	Wound dehiscence	Nil	Sec. suturing	Nil
37	++	Nil	Oro cuta fistula	Orocuta fistula	Nil	Fl. adjust	Nil
38	+++++	Nil	Nil	Nil	Nil	Nil	Nil
39	++++	Nil	Nil	Nil	Nil	Nil	Nil
40	+++	Nil	Nil	Nil	Nil	Nil	Nil
41	++++	Nil	Nil	Nil	Nil	Nil	Nil
42	++	Nil	Nil	Nil	Nil	Nil	Nil
43	+++++	Nil	Nil	Nil	Nil	Nil	Nil
44	++		Nil	Nil	Nil	Flap cover	Nil
45	+	Nil	Oro cuta fistula, wd inf	Nil	Nil	Fistulaflap ad	Nil
46	+++++	Nil	Nil	Nil	Nil	Flap adjtm	Nil
47	+++	Nil	Nil	Nil	Nil	Nil	Nil
48	+++	Nil	Nil	Nil	Nil	Nil	Nil
49	+++	Nil	Nil	Nil	Nil	Nil	Nil
50	+++	Nil	Nil	Nil	Nil	Nil	Nil

