http://jmscr.igmpublication.org/home/
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v8i2.30

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Narayanan Flap in Primary Reconstruction of Large Cheek Defects Following Cancer Resection

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Introduction

- Carcinoma buccal mucosa and gingivo-buccal sulcus are common malignancies in our country.
- Following wide local excision / composite resection of tumour, there are large cheek defects.
- The Narayanan bilobed flap can be used specially for reconstruction of these large post-excisional defects in patients with advanced malignancies.
- This flap uses both anterior and posterior branches of the superficial temporal artery to harvest the forehead skin and a scalp flap on a single pedicle**.**

Materials and methods

A prospective study was done from june 2017 to june 2019 on 10 patients who presented to department of General surgery, King George hospital/Andhra Medical College, Visakhapatnam with symptoms and signs of carcinoma buccal mucosa.

Aims and objectives

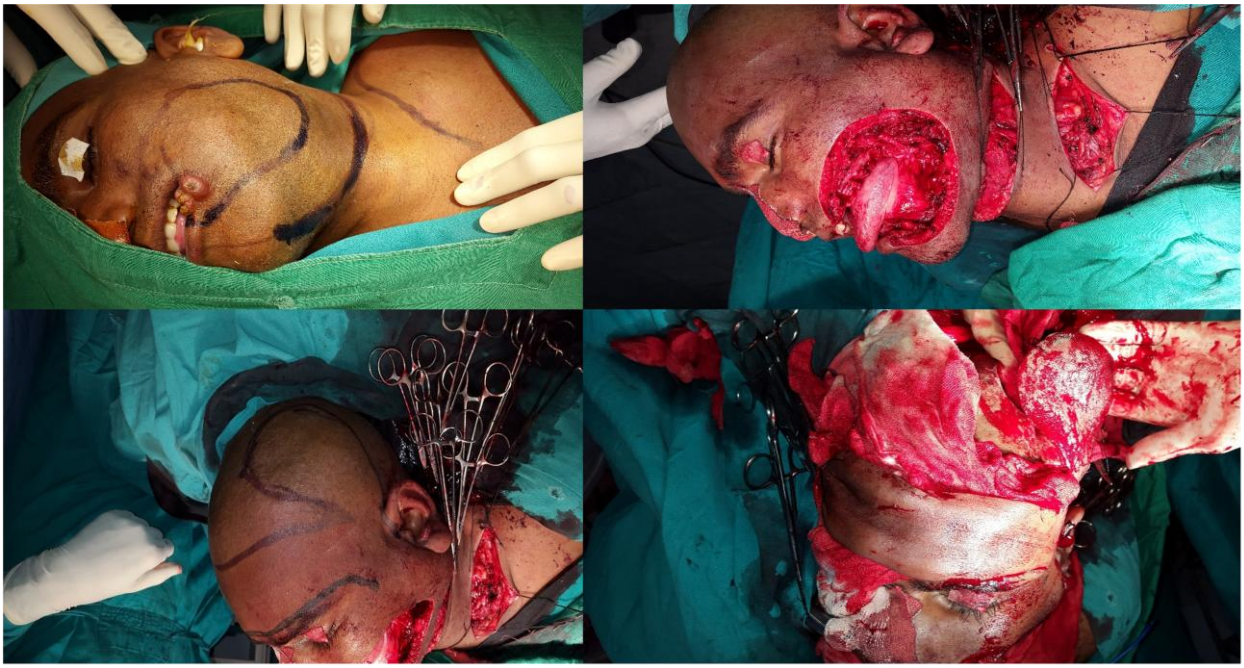
To study the use of Narayanan flap for reconstruction of large full-thickness cheek defects in males.

Narayanan bilobed flap design

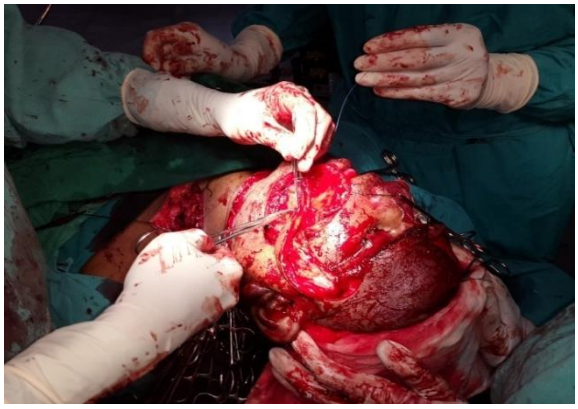
- The superficial temporal artery divides into a frontal and an equally large parietal (posterior) branch.
- The frontal branch supplies the forehead flap, and it is used to reconstruct the intraoral mucosa.
- The scalp, supplied by the parietal branch, can be used for external skin coverage

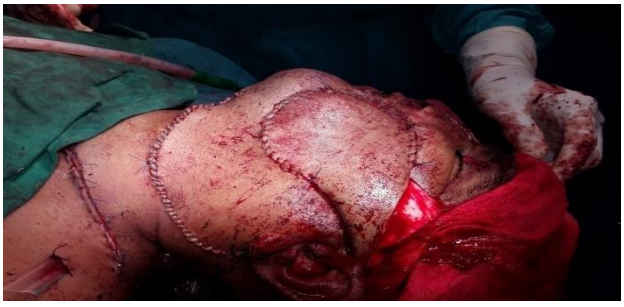
Operative technique of Narayanan flap

- The branches of the superficial temporal artery are identified by palpation.
- The lines of incision start as with the standard forehead flap, but at a point about 5 cm above the bifurcation of the anterior and posterior branches of the temporal artery, the incision deviates posteriorly to enclose a wide parietal scalp flap that has the exact dimensions of the skin defect.
- The flaps can be measured accurately by cutting out patterns of the mucosal and skin defects on sterile gauze.
- The frontalis muscle and the parietal scalp flap are raised at this same loose areolar tissue level.



• **A:** Defect of cheek and upper neck at completion of tumor excision. **B:** Scheme of the bilobar forehead skin and scalp flap based on the frontal and parietal branches of the superficial temporal artery. The forehead portion is used to restore cheek lining to the defect. **C:** Scheme of folding over the scalp portion of the flap to provide skin coverage. Note that the fold posteriorly is not divided or set into place at this operation, so a fistula is present. The scalp defect is skin-grafted. **D:** Several weeks later, the fold in the flap is divided. The inner edge is used to close the lining, and the outer edge is used to close the skin surface. (From Narayanan, ref. 5, with permission.)





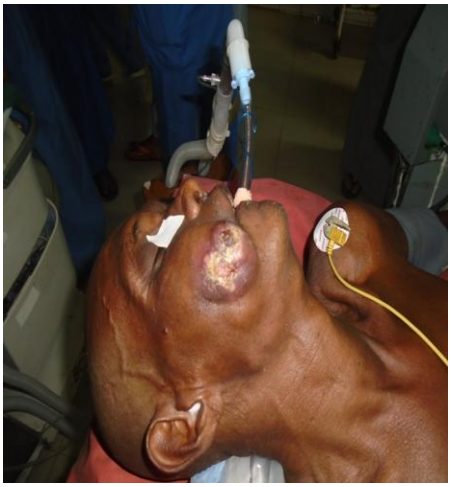
Inclusion criteria

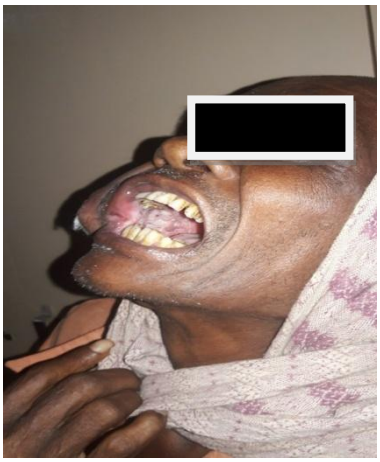
- All male patients who presented to General Surgery OPD with a non healing ulcer or an ulceroproliferative lesion in the oral cavity.
- A diagnosis of carcinoma is confirmed by edge biopsy from ulcer and FNAC from lymph nodes.

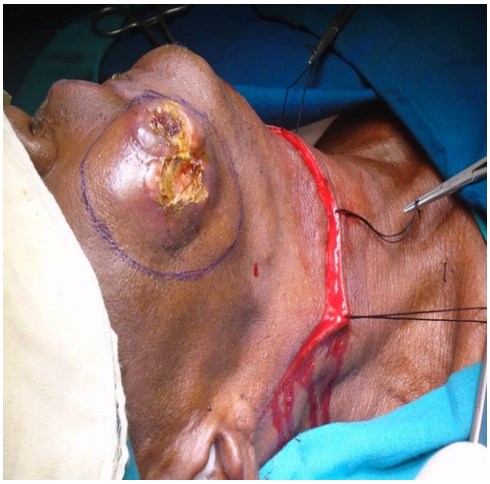
Exclusion criteria

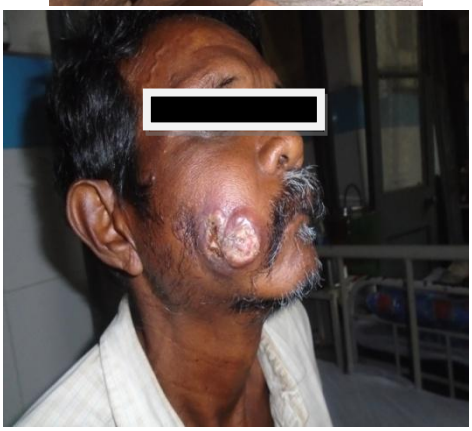
- Patients with synchronous malignancies elsewhere in the body.
- Female patients as Narayanan flap uses scalp skin for reconstruction over the face which is hairy and it is not aesthetically acceptable in females.
- Detailed history noted.
- Thorough Clinical examination done- growth, site, size, invasion into adjacent structures is determined clinically and radiologically.
- In neck, level of lymph nodes involved, nodal size and their consistency are examined.
- X-ray Mandible, Orthopantomogram, CT Scan of the Head and neck, Liver function tests, X-ray Chest and Routine Surgical profile done.

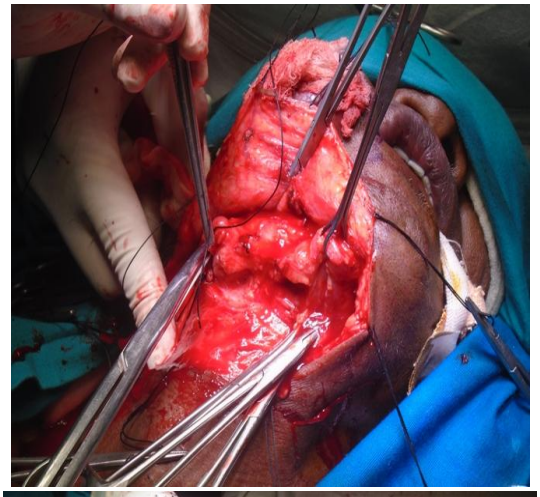
- Staging as per latest TNM classification, preoperative preparation, planning of surgery was done.
- All the 10 cases were treated with Composite resection including some form of Mandibulectomy, Radical neck dissection and reconstruction with Narayanan flap.
- After surgery patients were referred for adjuvant Radiotherapy and were followed up for six months and at follow up the outcomes were analysed and discussed.

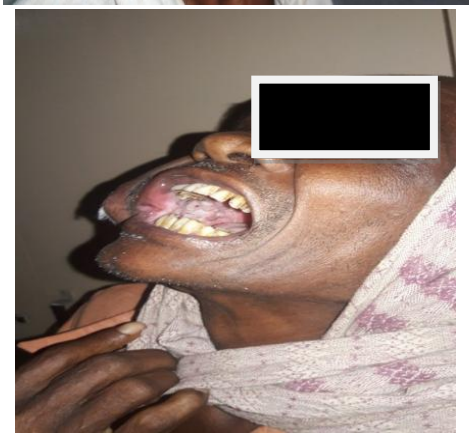


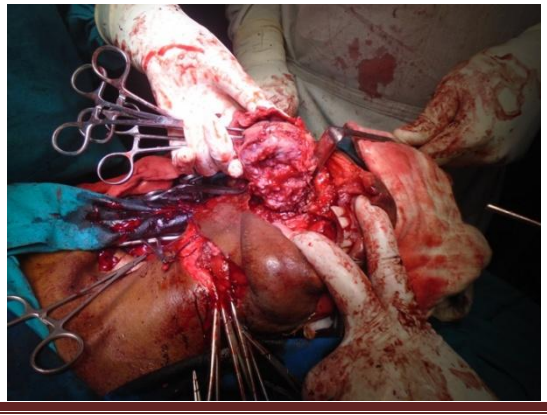


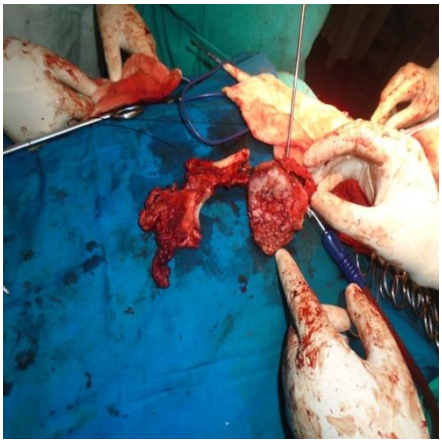


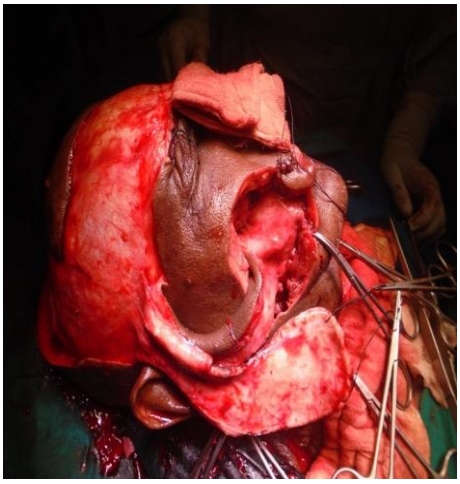


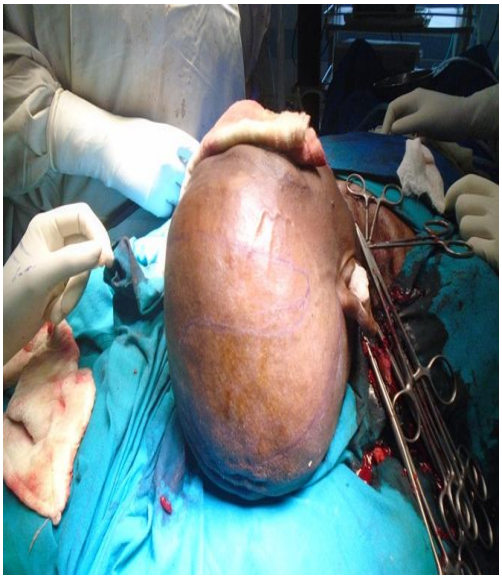


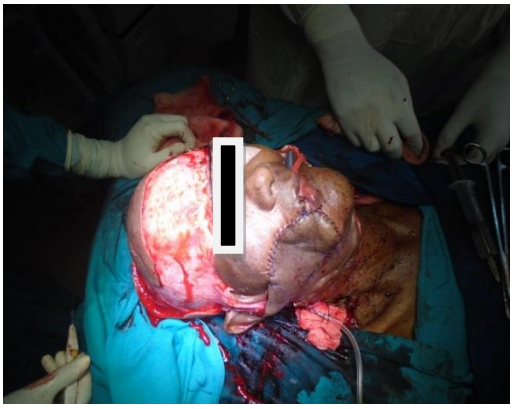


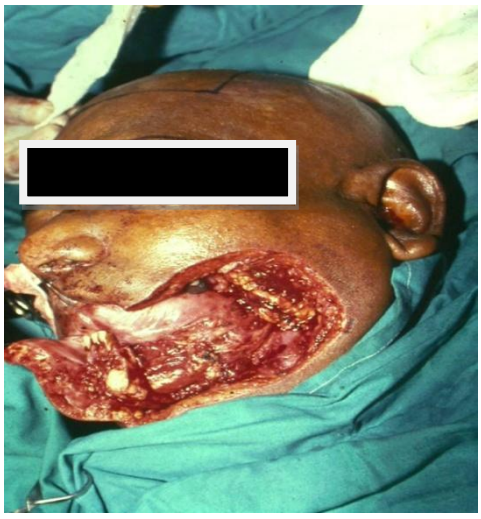


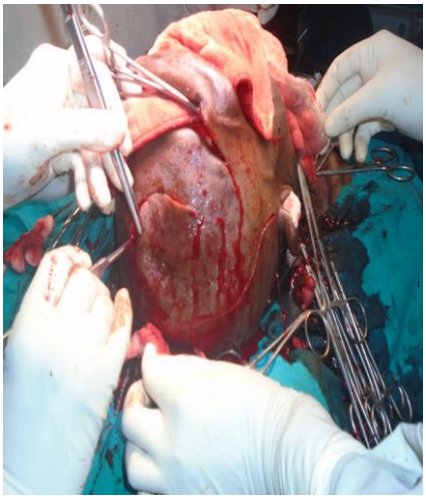


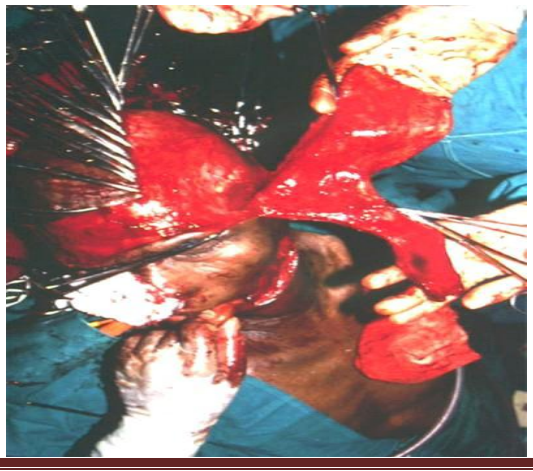


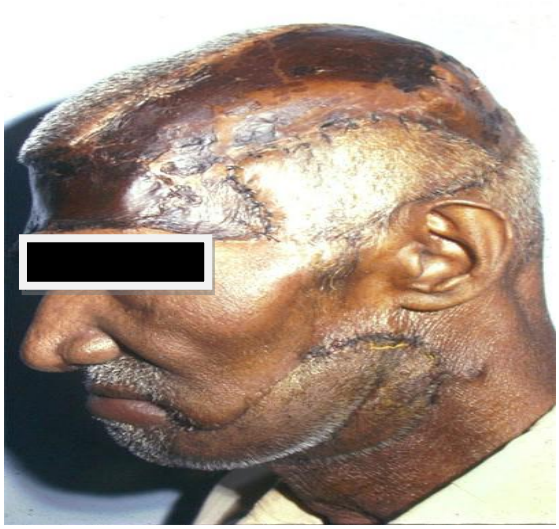


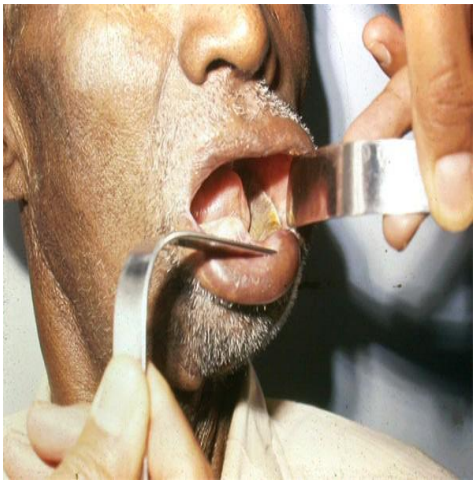


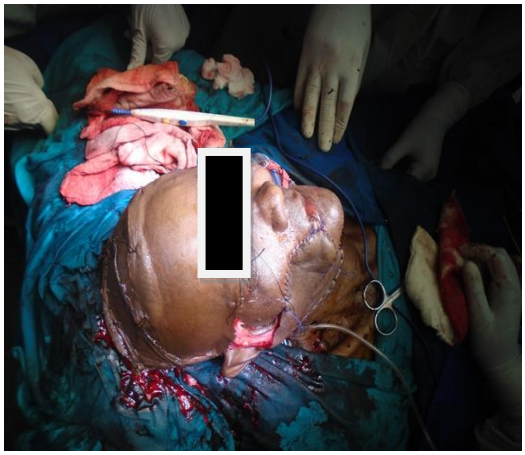












Results

- A case study of 10 cases was conducted at KGH, Visakhapatnam.
- Tobacco was identified as the causative agent in all the patients many of whom presented in 50 – 70 years age group (6 cases - 60%).
- Non-healing ulcer of oral cavity was the commonest presentation in most cases.

Results

The histopathology was Squamous cell carcinoma in all the cases.

Most of the cases are stage IV at presentation.

Table1. Clinical features and staging

Clinical features	no. of patients	percentage
Ulcer	1	10%
Ulceroproliferative growth	9	90%
Trismus	6	60%
Clinical staging (TNM)		
Stage 1	0	0%
Stage 2	0	0%
Stage 3	1	10%
Stage 4	9	80%

All the cases underwent surgery.

- Postoperative period was uneventful in all the patients. Wounds healed well. There is no flap necrosis in any case. Patients were on Ryle's tube feeds for three weeks and then allowed oral feeds.
- All the patients were sent for external Radiotherapy.
- Ulceroproliferative growth was the most common presentation
- Most of the patients presented with advanced stage, usually T3 or T4 lesions.

Table 2 Histopathology

Tumour type	**No. of patients**	**percentage**
Well differentiated	6	20%
Moderately differentiated	3	30%
Poorly differentiated	1	50%

All pts are diagnosed preoperatively and post op biopsy as Squamous cell carcinoma, of which well differentiated carcinoma is commonest variety

Table 3 complications following Composite resection and Narayanan flap reconstruction there was no flap necrosis, no wound dehiscence.

complications	**no. of patients**
Flap necrosis	0
Infection, Wound dehiscence	0

Discussion

- Cancers of the oral cavity account for about 30% of all malignancies in our country.
- Most of the oral cancers present in an advanced state where there is involvement of the skin and sometimes even with a Orocutaneous fistula. Surgical resection is the only definitive treatment in these aggressive and advanced disease.

Discussion

If the growth is small, wide excision with primary closure of the defect is possible.

In large growths like T3 and T4 lesions, wide excision amounts to Composite Resection.

Discussion

Composite Resection means resection of the buccal mucosa along with one or one and half cms. of healthy mucosa in all the dimensions, underlying soft tissues of the cheek, a portion of the mandible and overlying skin.

Discussion

Mandibulectomy can be resection of the

Margin of the Mandible –Marginal Mandibulectomy

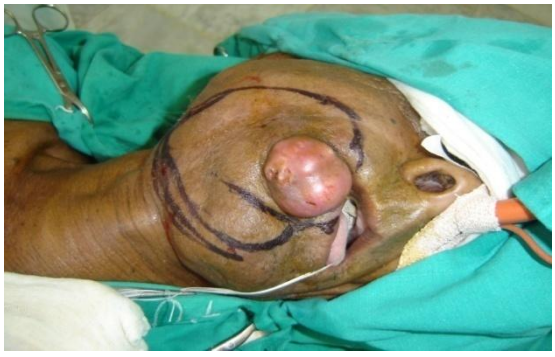
Segment of the Mandible-Segmental Mandibulectomy

One half of the Mandible – Hemi Mandibulectomy

Discussion

A Partial Maxillectomy also may be required if there is an involvement of the upper alveolus.

After major resections of the Oral malignancy, there is a large defect which needs to be reconstructed. Primary reconstruction is always preferred as it is less morbid and a second procedure can be avoided.



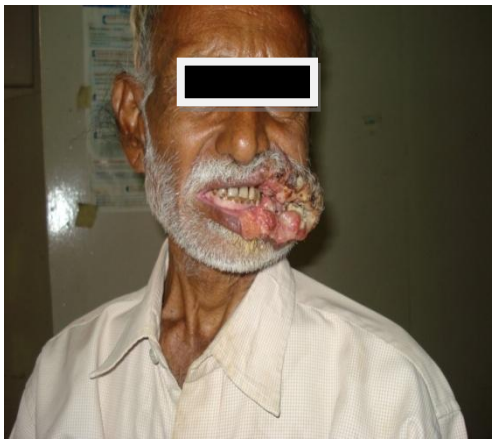
Discussion

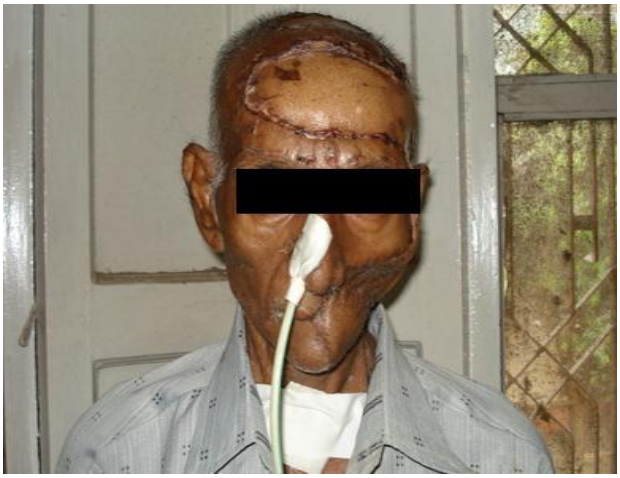
Narayanan flap is a very versatile flap used in reconstruction of the major cheek defects where we need to reconstruct both the mucosa and also the skin.

This flap was introduced by a South Indian Plastic Surgeon, Dr.Narayanan.

Discussion

- Reconstruction after extirpation of oral cancers continue to be a surgical challenge.
- Majority of patients are debilitated and present with locally advanced disease.
- These patients need adjuvant Radiotherapy in most cases. They tolerate Radiotherapy well because of the good vascularity of the flap.





Conclusion

The following conclusions were drawn from this study:

Narayanan flap is quite a reliable flap as the flap necrosis is a very rare problem. Properly planned Narayanan flap is adequate and effective for most of the large full thickness post-excision cheek defects in the face.