# Maxillary sinus in Dentoalveolar Surgery and Trauma

# Oro-antral fistula:

Invasion of the maxillary sinus and establishment of a direct communication with the oral cavity is referred to as an oro-antral fistula.

# Fistula:

- Is a biological tract that connect an anatomical cavity with the external surfaces or another anatomical cavity, (***unlike sinus tract***). It is always lined with a stratified squamous epithelium and the potency of the tract is preserved until epithelial cells scraped off.

# Factors influencing creation of oro-antral fistula:

- Teeth size and configuration of the roots.
- Hypercementosis and bulbous roots.
- Density of alveolar bone and thickness of sinus floor
- Size of the sinus.
- Relation of sinus to the root of upper teeth.
- Rough extraction and misguided manipulation.
- Apical pathosis and attached granulomas.
- Periodontal diseases which may erode sinus floor.
- Presence of cysts and neoplasm.
- Invasive surgery e.g. cleft and dental implants placement.

## Signs and symptoms of newly created oro-antral fistula:

- Antral floor attached to roots apices of extracted tooth or teeth.
- Fracture of the alveolar process or the tuberosity.
- Evidence of air stream passing from nostril.
- Bubbling of blood from the socket or nostril.
- Change in speech tone and resonance.
- Radiographical evidence of sinus involvement.

## Confirmation of existence of oro-antral fistula

- Instruct patient to occlude the nostrils and blow genteelly "nose-blowing' test".
- If nose-blowing' test is negative, don't explore the opening with suction tip and/or probes.
- Don't attempt to irrigate the sinus to confirm diagnosis, especially if the sinus drainage is impaired due to pre-existed sinusitis.
- Always check radiograph for the continuity of sinus floor and presence of entrapped foreign body.

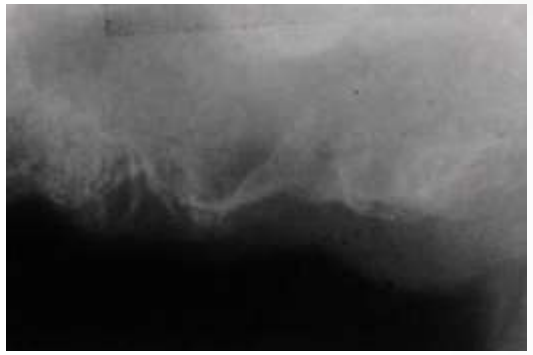
# Displacement of tooth or root into the maxillary sinus lining or the sinus cavity proper

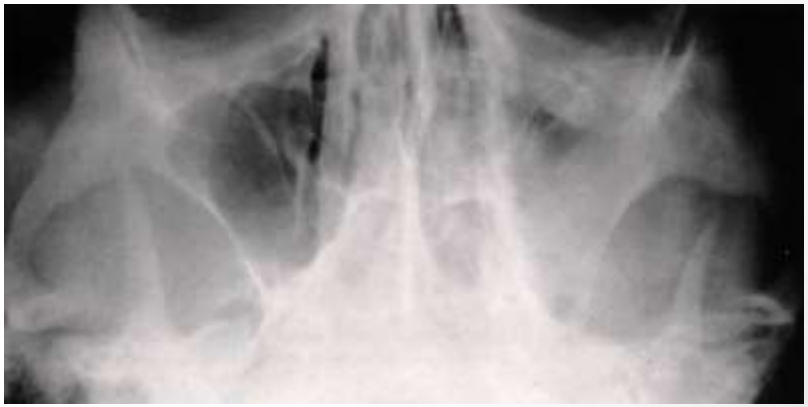
- It is basically a mishap incident results from a neglected act by the operator while applying wrong force.
- Occurs rarely but the 3rd molar and 2nd premolar are the most at risk of dislodgment.
- May occur during forceful mouth opening of unconscious patient when using mouth gag of periodontaly involved teeth.
- May occur with severe maxillofacial injures.
- In association with poor surgical technique.

# Immediate management/

# investigations

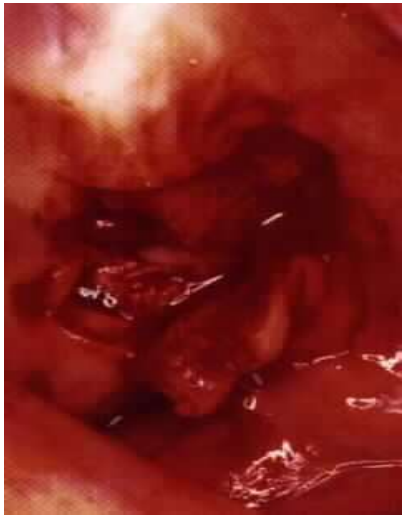
- Confirm the existence of oro-antral fistula and the presence of tooth or root in sinus using dental,occlusal, panoramic and occipito- mental radiographs.
- Locate the precise position of the foreign body within the sinus lining or in the sinus cavity proper “head-shaking test”.

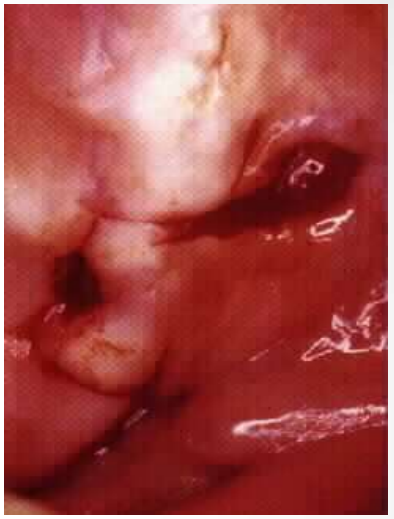


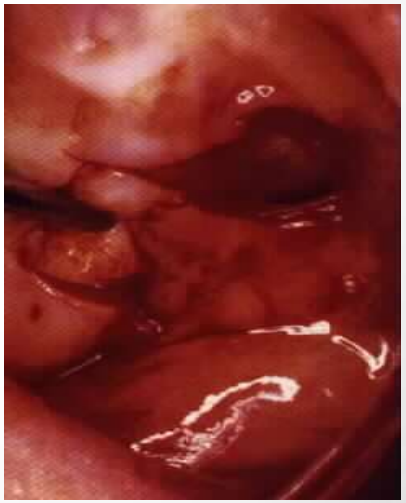


# Immediate management/ foreign body retrieval

- Reflect mucoperiosteal flap.
- Reduce alveolar bone height.
- Retrieve the tooth or the root by permitting their movement away from the sinus.
- If root or tooth dislodged into the sinus proper, consider Caldwell-luc approach.
- Undermine the flap and replace across the bony defect.



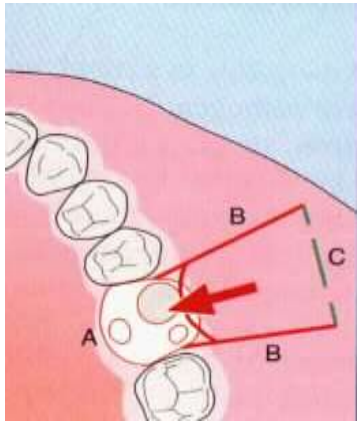


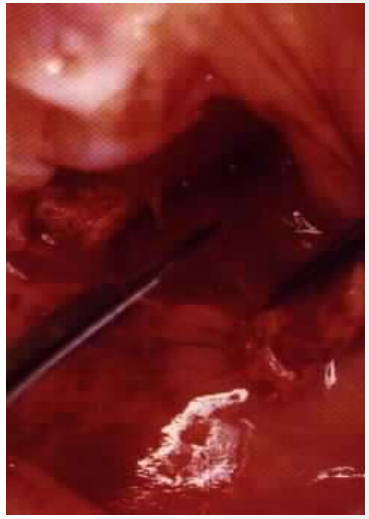


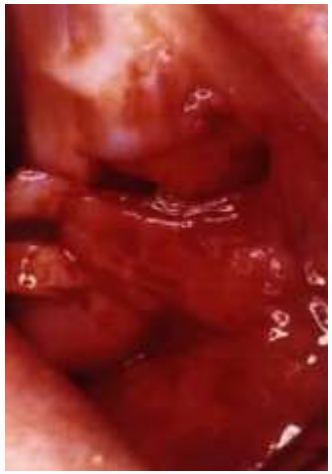
# Immediate management/

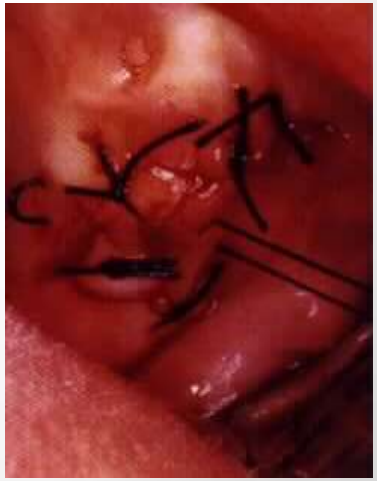
# closure of the defect

- Relieve the tension of the flap by serving the periostium.
- Advance the flap across the defect and beyond.
- Anchor the corner of the flap and approximate the edges using horizontal mattress sutures.







# antral fistula

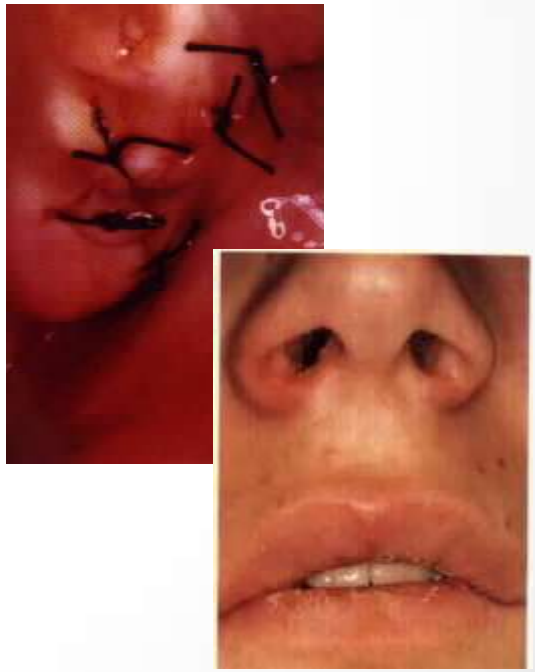
*becomes less popular due to transmission of infection*

*;BSE-FJD*

- Use of lyophilized sterilized collagen sheet:
  - reflect mucoperiosteal flap.
  - reduce the height of bony socket .
  - trim the collagen sheet to cover only the bony defect.
  - slide underneath buccal and palatal extensions of the flap.
  - secure the graft by suturing the flap extensions.

# Postoperative care/ Home car

- Acrylic base plate (surgical stint) may be prescribed to add additional support to the area.
- Patient should avoid forceful nasal blowing, if forced to do so, no occluding of nares.
- Oral hygiene must be kept optimum.



# Postoperative care/ medications

- ℜ Antibiotic
  e.g. Penicillin or penicillin derivatives
- ℜ Analgesic and NSAI
  e.g. Paracetamol, profen (PRN)
- ℜ Nasal decongestant
  e.g. Ephedrine or otrivin nasal drops
  3 drops/ 3times daily / 7 days
- ℜ Steam inhalation
  e.g. menthol and benzoin
  40 good sniffs
  should follows nasal drops

# Precaution measures in prevention of oro-antral fistula

- Don't apply forceps to maxillary posterior teeth unless enough tooth structure is sufficient to permit the blades to be applied.
- Fractured root apex, in particular the palatal root of vital maxillary molar is better to put on probation.
- Removal of isolated maxillary molar or extraction in a patient with H/O antral involvement must warrant careful radiographical assessment.
- Removal of any maxillary root, if indicated, should be preceded by accurate localization via trans-alveolar approach.
- Surgeon must provide a support for blood clot to organize by means of figure eight suture or using of surgical stint.

# Chronic oro-antral fistula/

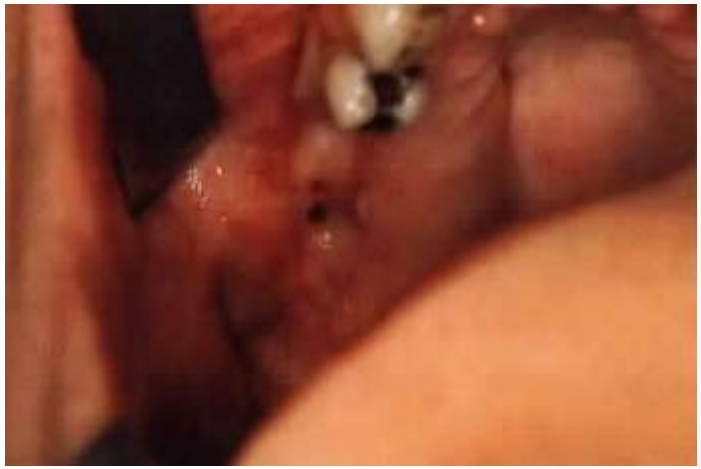
# persistent oro-antral communication

It might be a complication of:

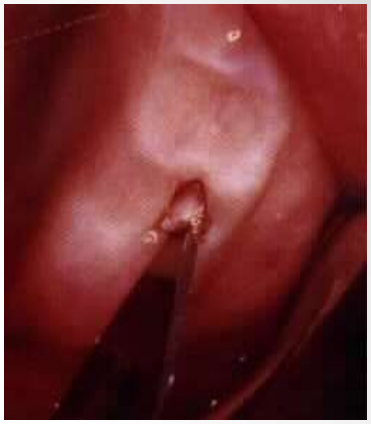
- Unrecognized (overlooked) fistula.
- Untreated fistula.
- Failure of spontaneous closure of OAF.
- Failure of surgically repaired fistula

# Signs and symptoms of chronic fistula

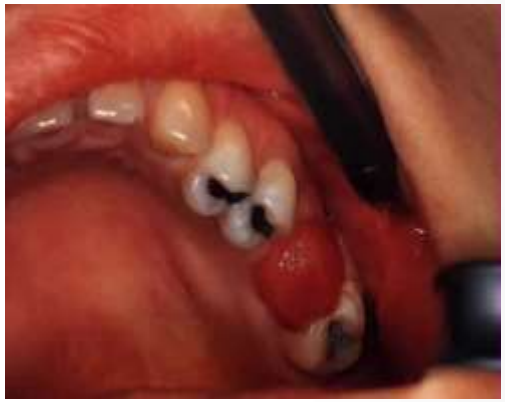
- Reflux of food and drinks.
- Loss of denture stability.
- Intermittent episode of pain and local tenderness.
- Foul-tasting discharge.
- Sings and symptoms of chronic sinusitis.

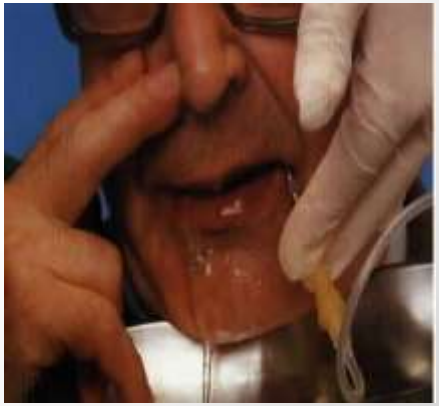


# Primarily management of chronic OAF



- it is aimed to eliminate any sinus infection:
- Excision of any mucosal polyp or purulent granulation to promote drainage.
- Regular irrigation with warm water or saline.
- Single course of antibiotics and nasal inhalation and decongestant.
- Acrylic base plate.





# Surgical management/

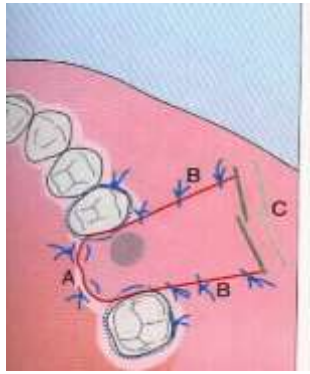
## Principles and requirements

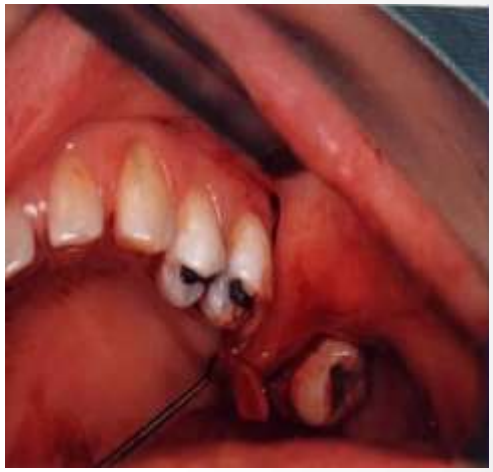
- Success of operation is not always garneted.
- Flap should have good blood supply.
- Flap tissue must be handled genteelly.
- Flap should lie in its new position without tension.
- Good haemostasis must be achieved before discharging the patients.

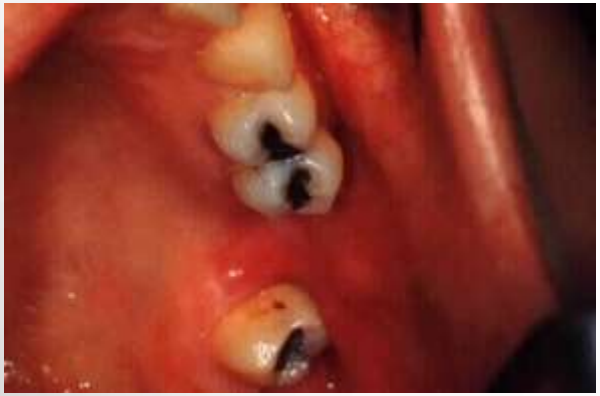
# Surgical management/

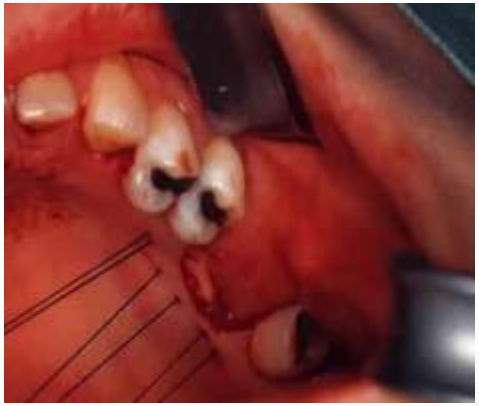
# types of repair

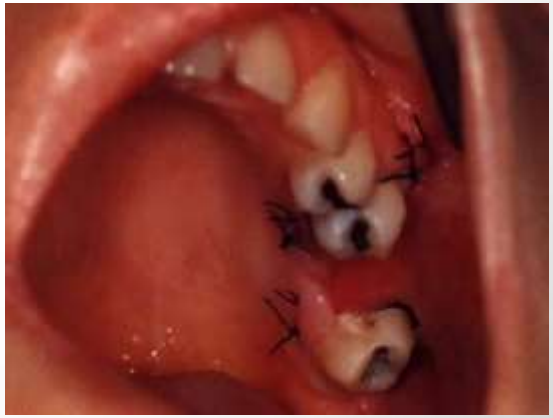
- Buccal advancement flap





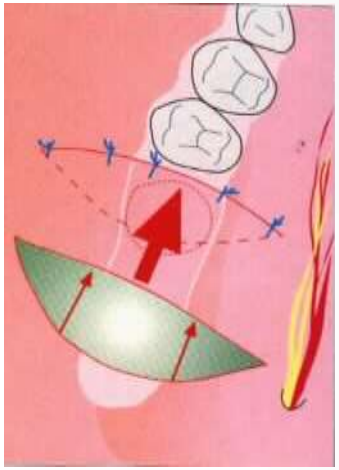


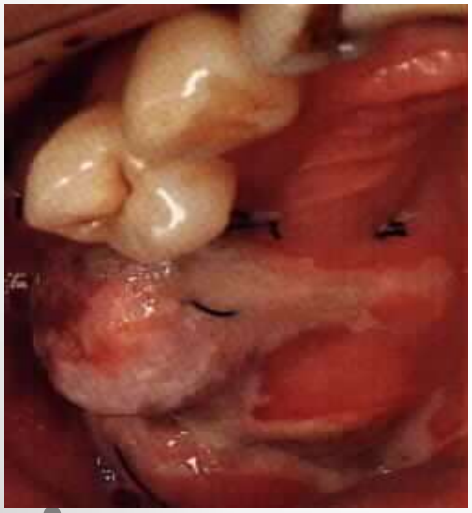


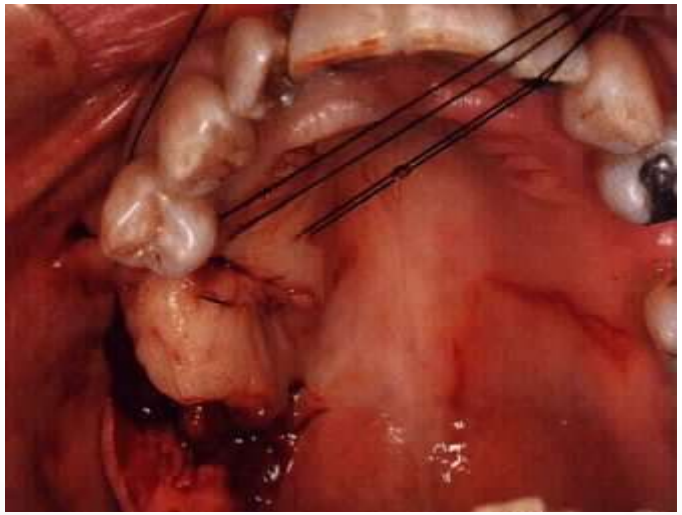
# Surgical management/

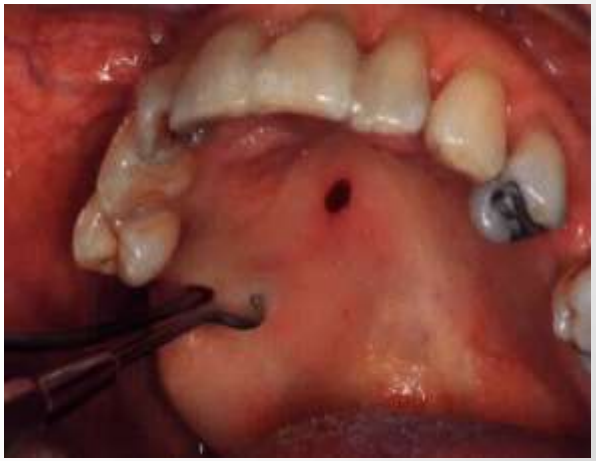
# types of repair

- Bridge (pedicle) flap





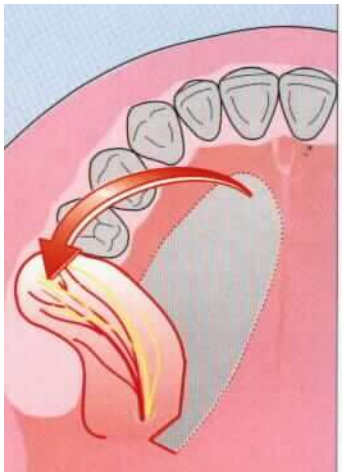


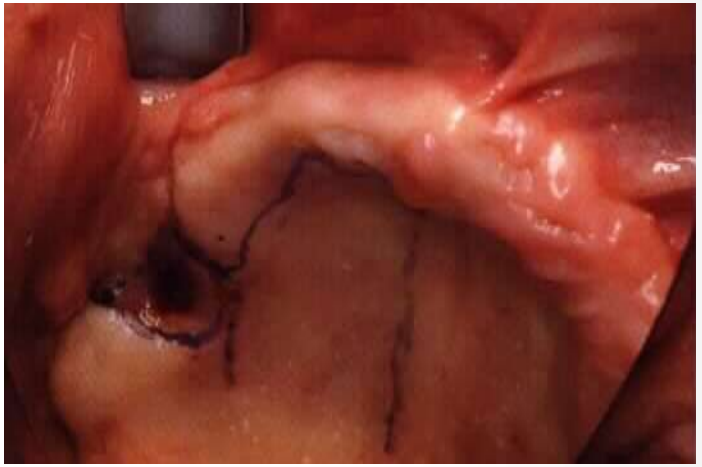


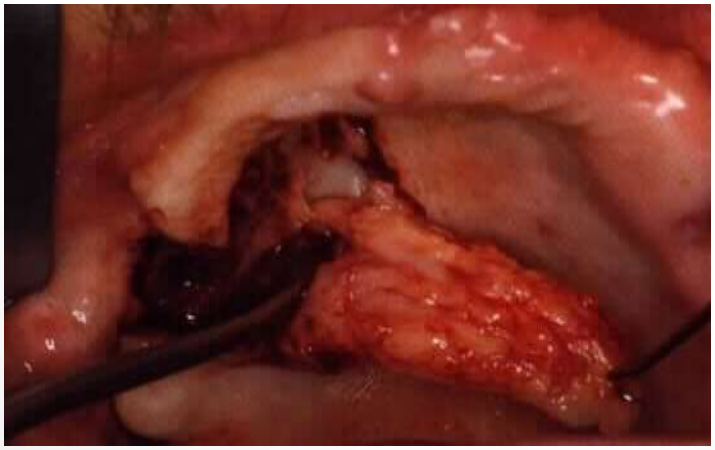
# Surgical management/

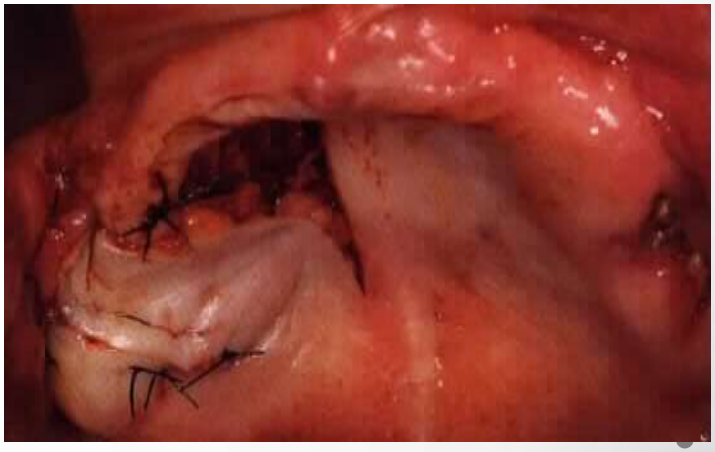
# types of repair

- Palatal transposition flap



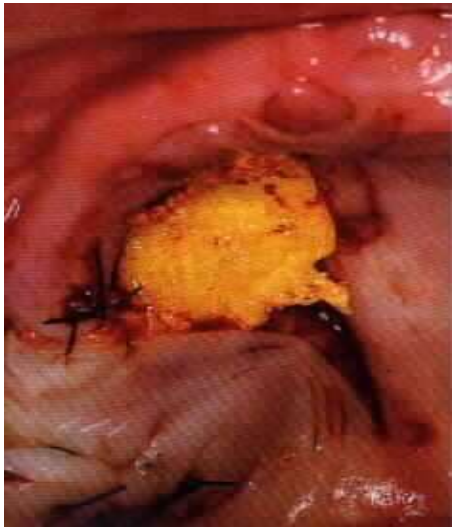


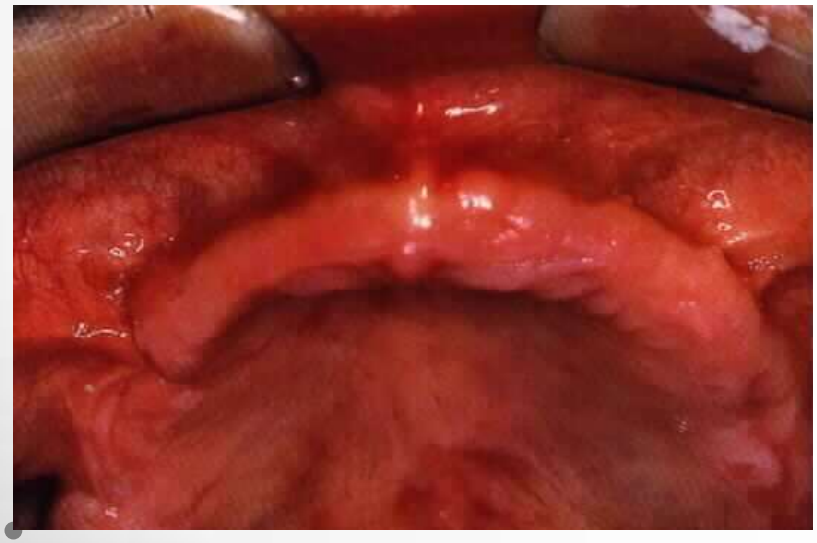


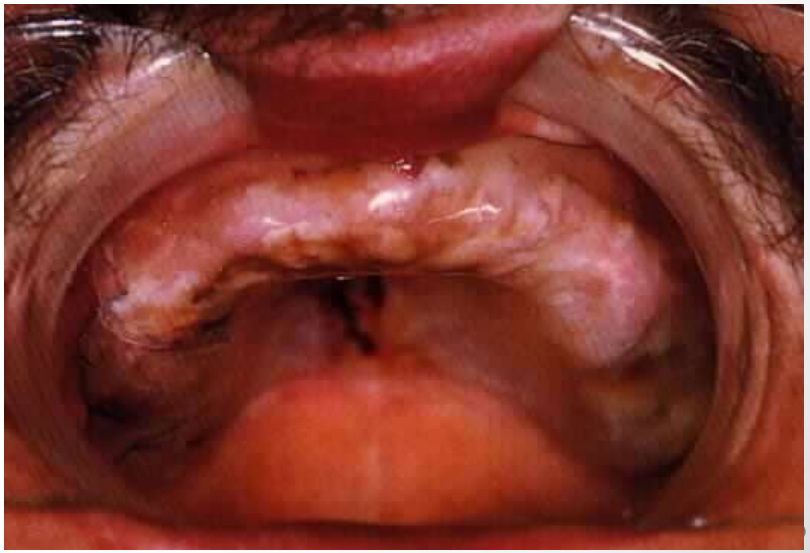


# Surgical management/

# types of repair





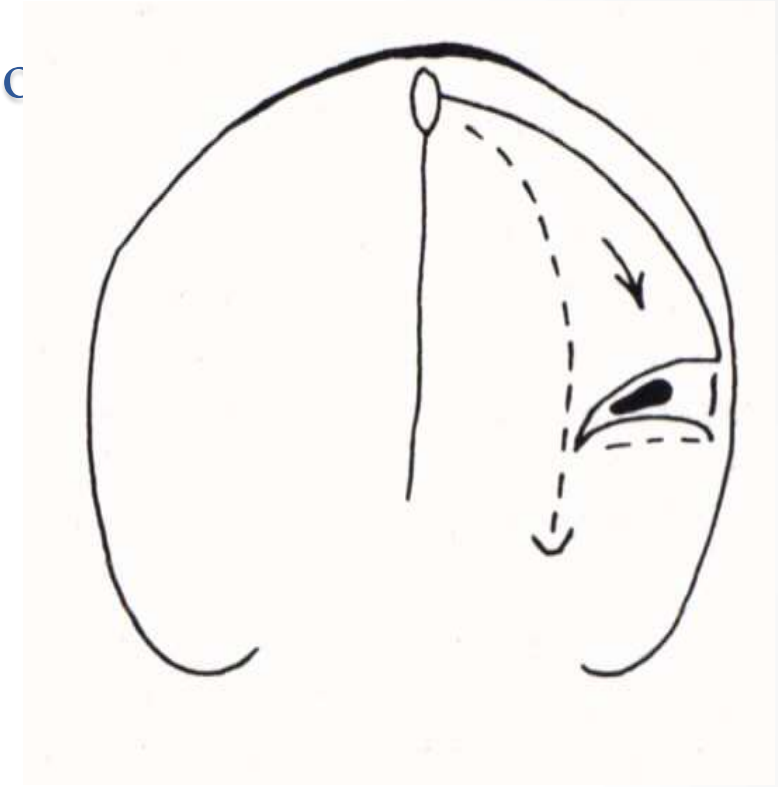


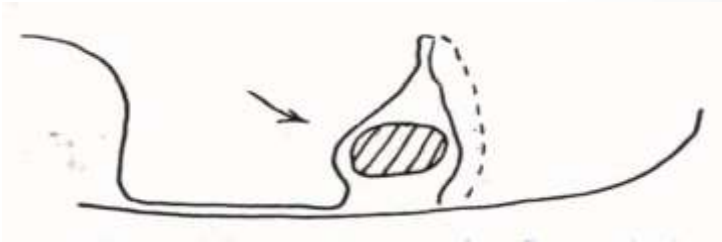
# Surgical management/

## types c

- Rotation palatal flap

This is only possible in edentulous patients; exclusively indicated for edentulous patient.

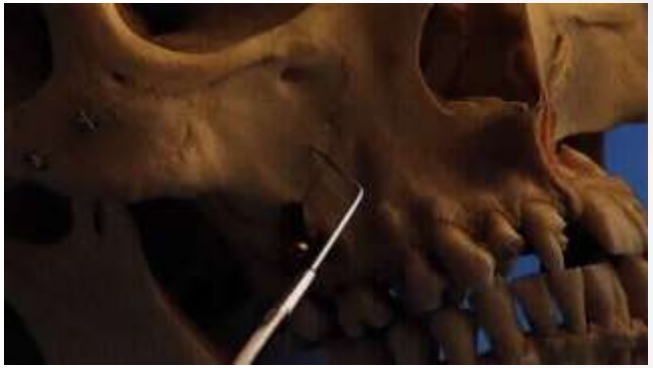


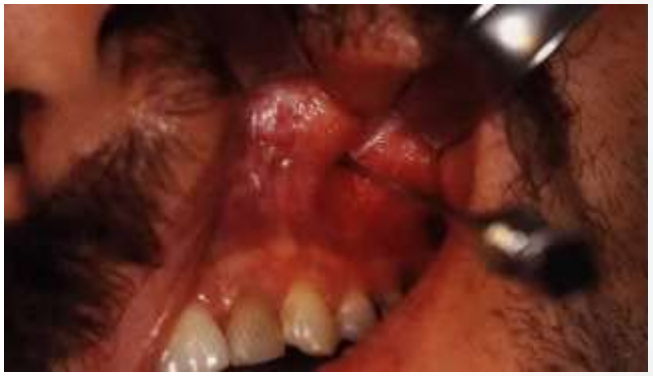


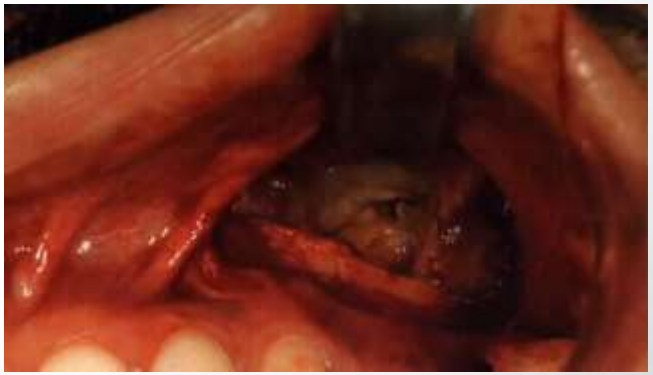
# Exploration of maxillary sinus

## Caldwell-luc approach

- Recovery of entrapped foreign body from the sinus cavity proper; displaced tooth or root.
- Excision of sinus polyps,tumors and cysts.
- Treatment of blow out orbital fracture.
- Grafting of maxillary sinus.







# Fracture of maxillary tuberosity/

## predisposing factors

- Expansion of sinus deep into the tuberosity.
- Maxillary molar teeth of divergent or hypercementosed roots.
- Maxillary tooth geminated or pathologically fused with adjacent one.
- Over-eruption of isolated maxillary tooth.
- Existence of pathological lesion.
- Increase in bone density and fragility.

# Management of tuberosity fracture

- In the event of tuberosity fracture:
  - Forceps extraction is to be abandoned.
  - Surgical extraction then to be instituted.
  - Dissection of bony fragment with attached tooth.
  - Approximation of flap using mattress suturing technique.

# Alternatively,

*In case of large scale fracture of the tuberocity and alveolar bone*

- bony fragment may be splinted in-situ using any method of fixation;

  Wiring or plating

- and tooth extraction is to be delayed until union occurs.