PRE PROSTHETIC SURGERY IN PROSTHODONTICS

BY: DR. SANJAY LAGDIVE
PROFESSOR, DEPT. OF PROSTHO,
GDCHA

ONTENTS:

INTRODUCTION

Prosthetics is the replacement of missing teeth (lost or congenitally absent) and contiguous oral and maxillofacial tissues, with artificial substitute.

Now, there remains significant number of patients, who c never be made to use dentures effectively, because of -

- Bone atrophy
- Soft tissue hypertrophy
- or localized soft and hard tissue problems.

In these patients pre-prosthetic surgery offers significant contribution by removing hindrance for prosthesis stabili and retention.

t is always hoped that the results of the preprosthet
urgery are acceptable both surgically & prosthodontic
n this vein, the services of an oral and maxillofacial
urgeon may be required, especially as the surgical
reparation becomes more complicated. In these
nstances, a team approach is needed with the surgeo
nd the prosthodontist serving as equal members of t
eam.

DEFINITION

Pre-prosthetic surgery is carried out to reform/redesign soft/hard tissues, by eliminating biological hindrances to receive comfortable and stable prosthesis.

Preprosthetic surgery is defined as surgical procedures designed to facilitate fabrication of a prosthesis or to improve the prognosis of prosthodontic care.

(GPT8)

AIMS OF PRE-PROSTHETIC SURGERY

Provide adequate bony tissue support for the placement of complete dentures.

Provide adequate soft tissue support, optimal vestibular depth.

Elimination of pre-existing bony deformities e.g. tori, prominent mylohyoid ridge, genial tubercle.

Correction of maxillary and mandibular ridge relationship.

Elimination of pre-existing soft tissue deformities, e.g. epulis, flabby ridges, hyperplastic tissues.

Maintain function

HARACTERISTICS OF IDEAL DENTURE BAS

- Adequate bony support
- Soft tissue coverage
- No undercuts or protuberances
- No sharp ridges
- Adequate sulci
- Absence of peripheral scar bands
- No muscle fibres to mobilize prosthesis
- No soft tissue folds/hypertrophies
- No neoplastic lesions
- Proper maxillomandibular arch relationships
- Adequate palatal vault

PLANNING

- Preprosthetic surgical treatment must begin with a prope
  ase history and physical examination
- Special attention should be given to systemic diseases tha
  nay be responsible for the severe degree of bone
  esorption.
- Esthetic and functional goals of the patient must be
  ssessed carefully.
- Long term maintenance of the underlying tissues as well a
  rosthetic appliances should be kept in mind.

PRE-PROSTHETIC SURGICAL PROCEDURES

N BE CLASSIFIED AS:

- Basic procedures: can be carried out under local anaesthesia on a day care basis.
- Advanced surgery procedures: require hospitalization a general anaesthesia.

ocedures are carried out for the following:

- Alveolar ridge correction
- Alveolar ridge extension
- Alveolar ridge augmentation.

I. ALVEOLAR RIDGE CORRECTION

ny surgeries –

- Alveolectomy
- Alveoloplasty
- Elimination of unfavourable undercuts
  - Reduction of genial tubercles
  - Reduction of mylohyoid ridge
- Excision of tori
- Maxillary tuberosity reduction and exostosis removal.

ft tissue surgeries –

- Removal of redundant crestal soft tissues
- Frenectomy
- Excision of epulis fissurata
- Excision palatal papillary hyperplasia.

BONY SURGERIES

ALVEOLECTOMY

Surgical removal or trimming of the alveolar process is termed as alveolectomy

Procedure:

After extraction whenever there is presence of sharp margins at interdental, interseptal or labiobuccal alveolar crest, they should be trimmed with bone rounger or roun four and smoothened with bone file.

ALVEOLOPLASTY

Alveoloplasty defined as surgical recontouring of the alveolar process.

This procedure is done with the purpose to take care of bony projections, sharp crestal bone or undercuts.

Conservation is the key factor in this procedure.

Types:

- Simple alveoloplasty
- Interseptal alveoloplasty: 1) Dean's alveoloplasty
  2) Obwegeser's modification
- Post-extraction alveoloplasty

SIMPLE ALVEOLOPLASTY

ocedure:

Bony areas requiring recontouring should be exposed using an **nvelop type** of flap.

A mucoperiosteal incision along the crest of the ridge with dequate A-P extension is given

Adequate visualization and **access** to the alveolar ridge btained

Vertical incisions given if necessary

Excessive flap reflection may result in **devitalized areas** of bone which may resorb rapidly after surgery

Recontouring can be accomplished with

- Rongeur

Copious saline irrigation should be done throughout the recontouring procedure **to avoid overheating** and **bone necrosis**

After this the edges of the flap are trimmed and then sutured with **continuous** or **noncontinuous** sutures.

DEAN'S INTERSEPTAL ALVEOLOPLASTY

Only done in maxillary anterior region to reduce gross maxillary over
et.

Mostly done immediately after extraction of anterior teeth.

This technique is best used in an area where the ridge is of relative
egular contour and adequate height but presents an undercut to the
epth of the labial vestibule.

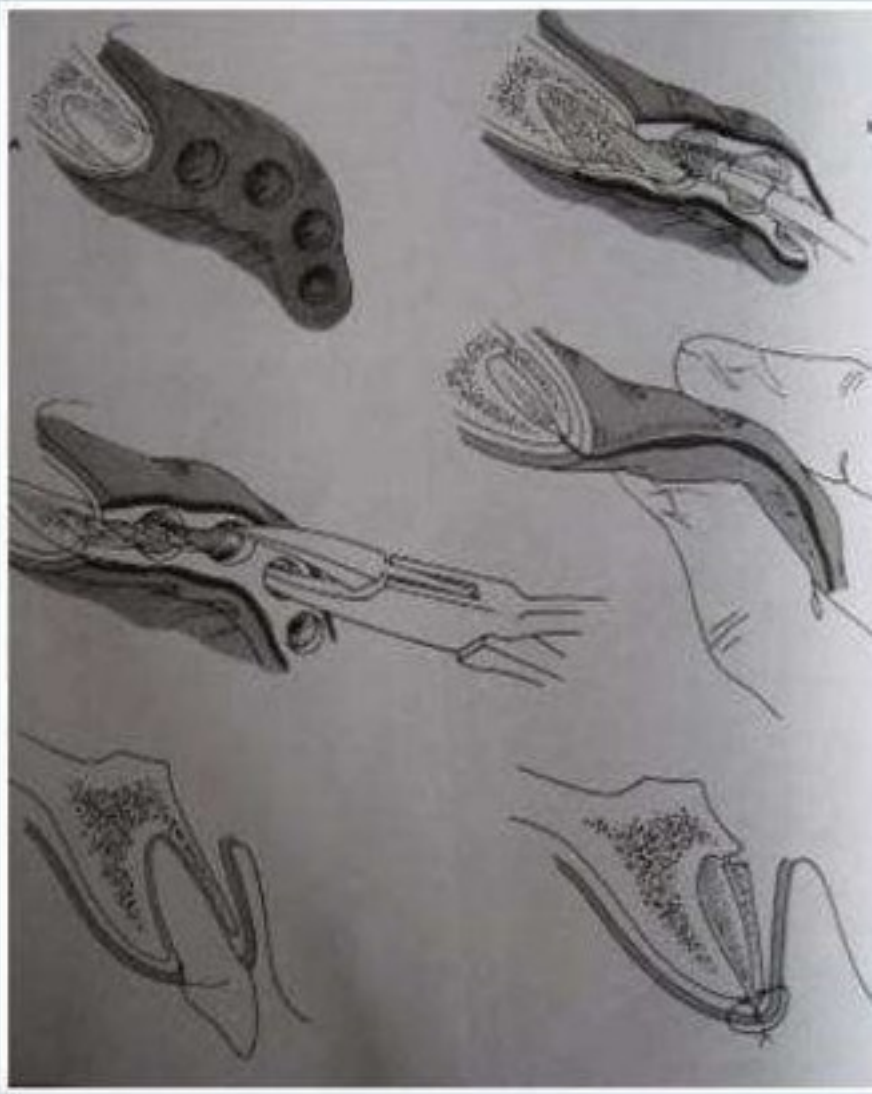
vantages:

- Labial prominence is reduced without reducing the height of the ridge
- The periosteal attachment to the bone can be maintained hereby reducing bone resorption
- Muscle attachments are left undisturbed

advantage:

Procedure:

- After anterior teeth extraction, Interseptal bone is cut with the bur from canine to canine region.
- With the same bur vertical cuts are made only in the labial cortex at distal end of the canine extraction socket bilaterally without perforation of labial mucosa.
- Now labial cortex is fractured with periosteal elevator and compressed into palatal direction in approximation with palatal plate.
- After removing any sharp margin, suturing is done.

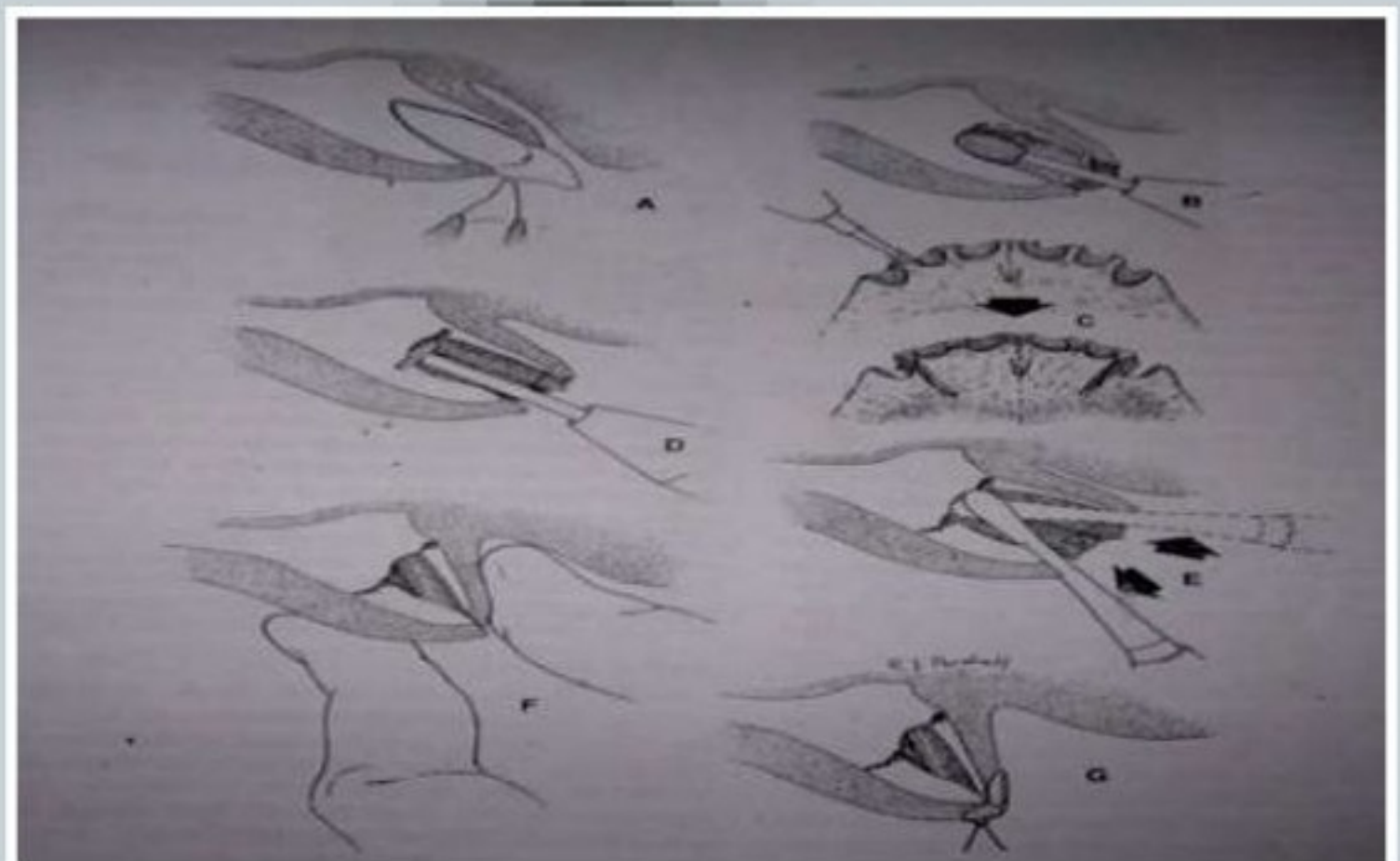


ALVEOLOPLASTY

n this both the labial and palatal cortices are repositione

his is done when the anterior over jet is too gross that ca

ot be reduced by labial plate repositioning.



Procedure –

- Procedure is same as dean's alveoloplasty but the only addition is that, here palatal plate is fractured too at its base and repositioned with labial plate in palatal direction.

LIMINATION OF UNFAVOURABLE UNDERCU

Unfavourable undercuts are developed due to severe trophy of the mandible which hinders in proper denture onstruction.

These undercuts are mostly present on lingual aspect of nandible like genial tubercle prominences, sharp nylohyoid ridge prominences.

Most of the times, patient wearing old dentures comes wi he complaint of ulceration or inflammation on these ingual prominences.

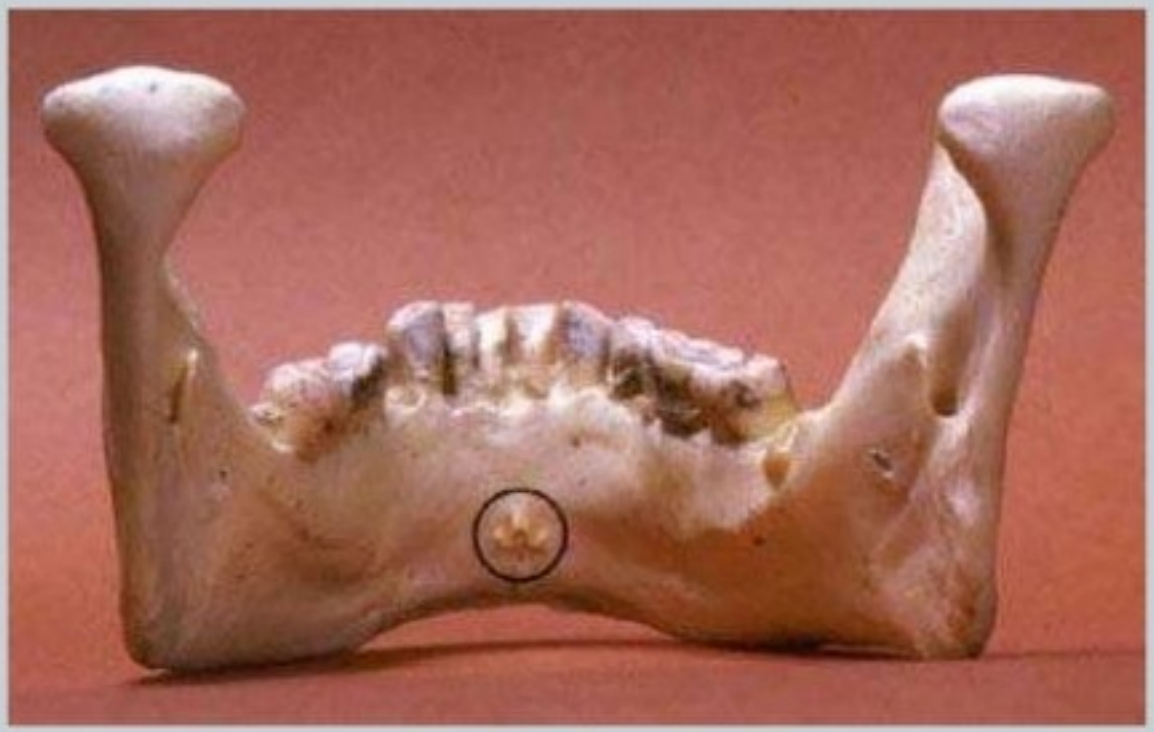
So surgical reduction should be carried out to relieve thes ndercuts.

REDUCTION OF GENIAL TUBERCLES

ocedure:

n this procedure lingual flap is reflected in anterior regio
f mandible and genial tubercles are reduced with the bu

hen Genioglossus muscle is sutured below at geniohyoid
ubercle and flap is closed.



REDUCTION OF MYLOHYOID RIDGE

ocedure:

Linear incision is made over the crest of the ridge in the posterior aspect of the mandible

Full thickness mucoperiosteal flap is elevated to expose th muscles

Bone file is used to remove the sharp prominance of the mylohyoid ridge

Mylohyoid muscle is sutured below and flap is closed.

EXCISION OF TORI – PALATAL TORUS

Palatal tori are usually present on the midline of the hard palate. Most palatal tori are less than 2 cm in diameter, but the size can change throughout life.

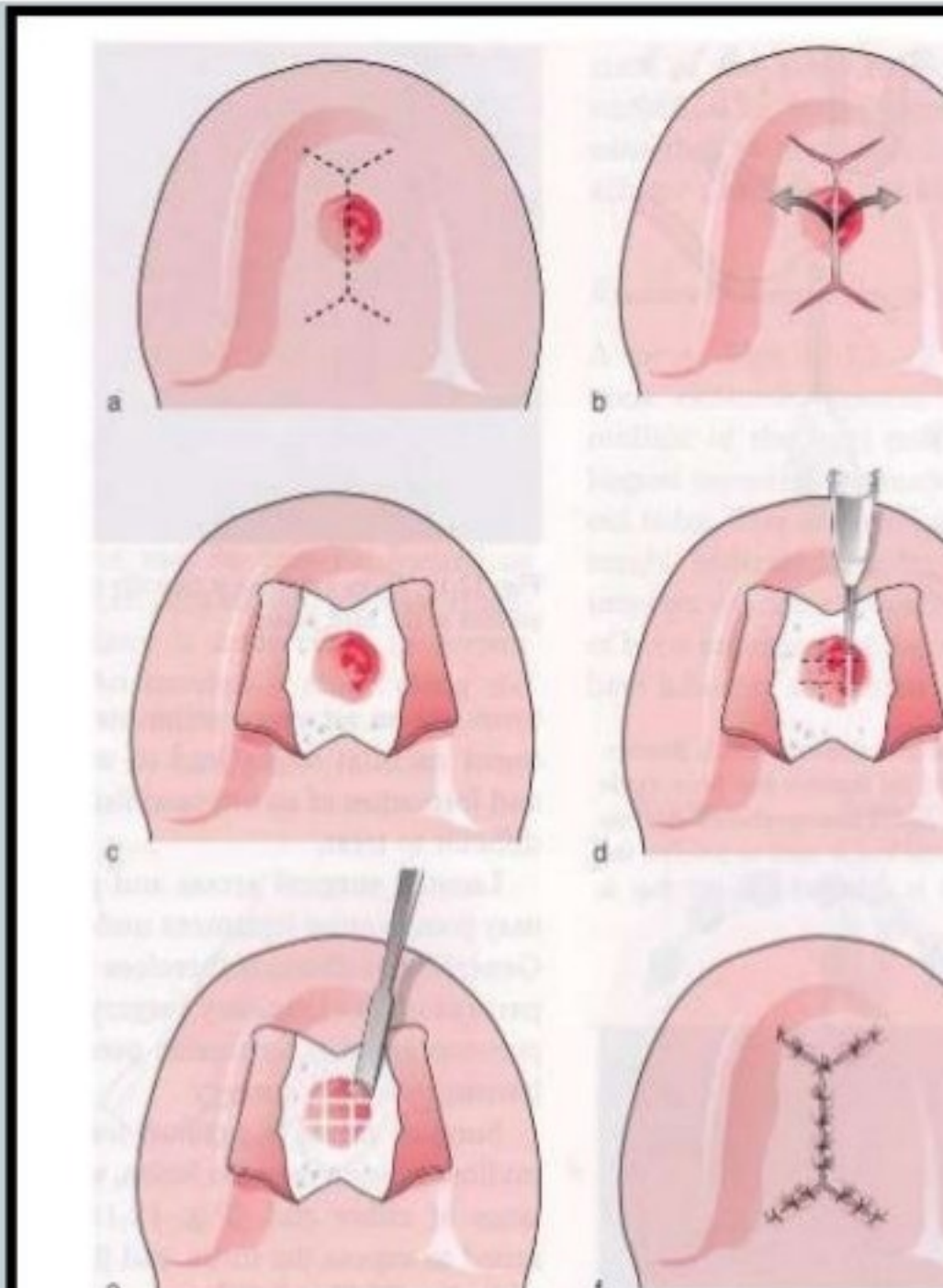
Indication:

- An extremely large torus filling the palatal vault.
- A torus that extend beyond the posterior dam area.
- Traumatized mucosa over the torus.
- Deep bony undercuts interfering with denture insertion and stabil
- Interference with function (speech, deglutition).

Small tori can be relieved during denture construction but larg tori should be surgically removed.

Procedure:

- In this, midline incision is given in palate and flap is reflected with Y-shaped releasing incisions.
- Torus is removed by making multiple cuts of it and flap is sutured.
- A palatal splint is given to prevent hematoma formation.



EXCISION OF TORI – MANDIBULAR TORUS

Torus mandibular is an exostosis found on the lingual surface of the mandible opposite the canine and premolar region.

They too interfere with denture retention because of the loss of marginal seal in premolar region.

Indication:

- Tori causing lingual undercuts and interfering with lingual flange extension of the planned prosthesis.
- When the mucosal covering is ulcerated.
- Large tori interfering with speech and deglutition

ocedure:

Bilateral lingual and inferior alveolar anesthesia is given

ncision extending from 1 to 1.5cms beyond each tori is given

Always leave behind a band of tissue attached to the midline between the anterior extent of the 2 incisions.

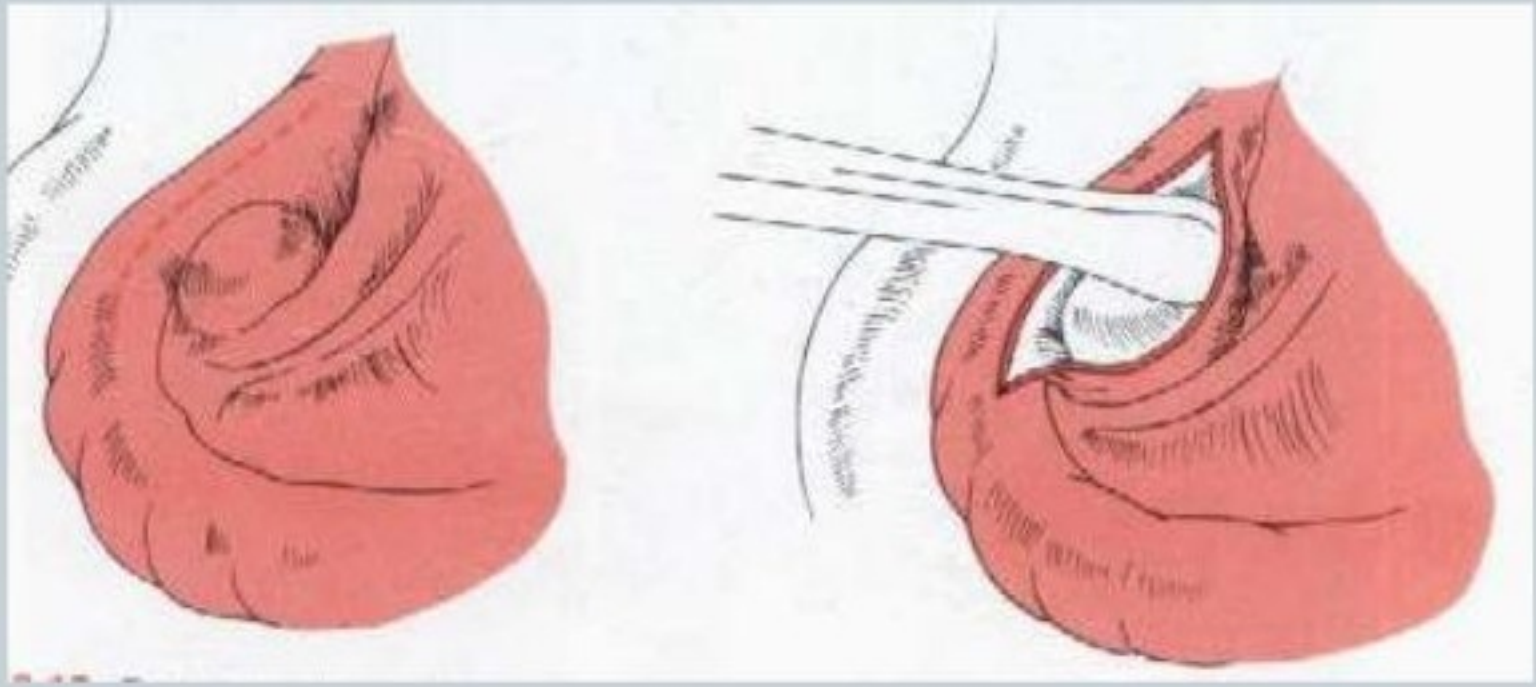
When the torus has a small pedunculated base, a mallet a n osteotome is used to cleave the tori from the medial spect of the mandible

The direction of the initial bur is parallel to the medial spect of the mandible to prevent fracture of the lingual c nferior cortex

A bone file is then used to smoothen the lingual cortex

Palpation is done to check for proper contour and presen of any undercuts

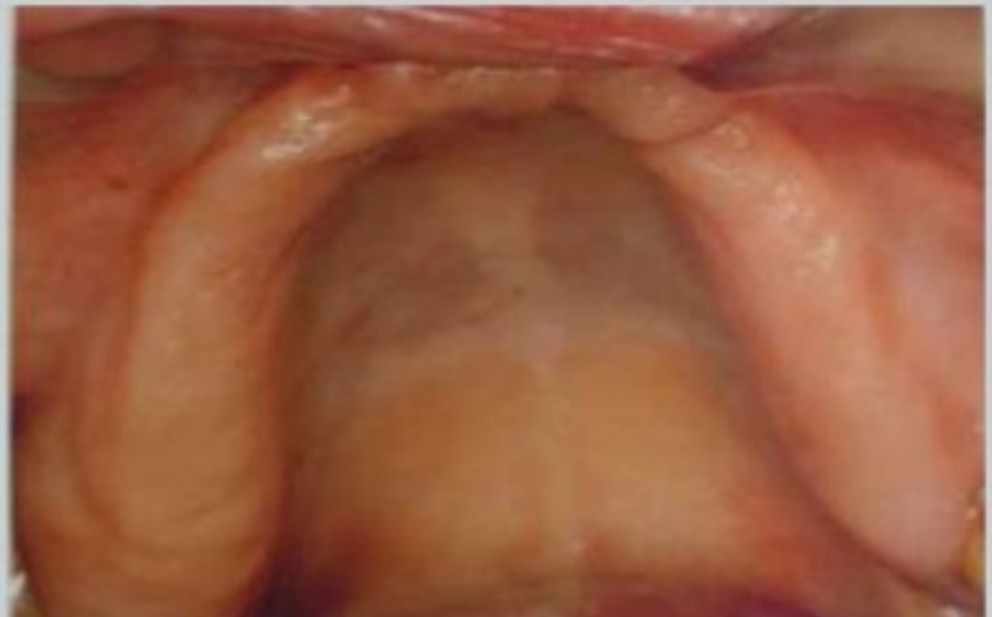
Continuous suturing is done and gauze packs are placed and retained for the next 12 hrs



REMOVAL

The main reason for tubercle overgrowth is extraction of opposing mandibular 3rd molars and subsequent supraeruption of maxillary 3rd molar, where remains as bony overgrowth after maxillary 3rd molar extraction.

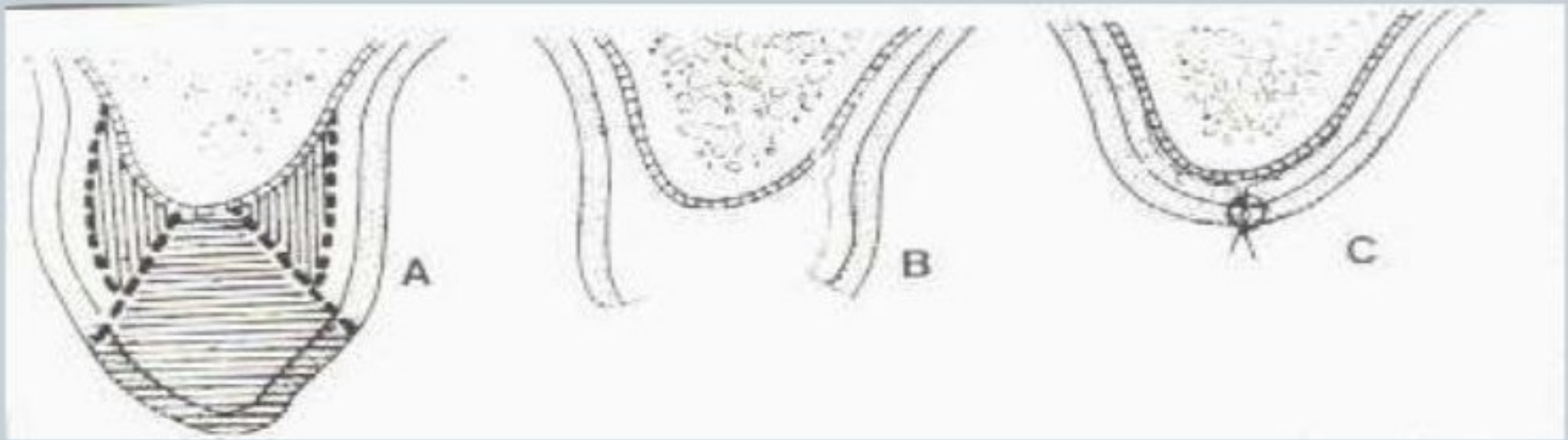
Maxillary tubercle interfere with denture construction because it decreases inter-arch space.



ocedure:

Crestal incision from tuberosity to pre-molar area should be given and hyperplastic soft tissue or bony overgrowth should be removed with the help of chisel, mallet or burs.

After desired contour is achieved , the excess soft tissue is trimmed and flap is sutured followed by splint over it.



SOFT-TISSUE SURGERIES

EDUNDANT CRESTAL SOFT TISSUE REMOVA

The presence of the fibrous, hyperplasic tissue gives rise t
labby ridge form.

These flabby ridges results in unstable base for dentures.

n maxilla – enlarged tuberosity

n mandible – enlarged retro molar pad

Surgical removal is done by particular requirements of th
issue growth.

FRENECTOMY

Many times there is high frenum attached near to the cres
of the ridge which may be too broad which interfere in
getting proper peripheral seal in denture.

Lingual frenum may be too short and attached till the tip
the tongue which interfere with normal tongue movemen
and causes speech problem to the patient , so surgical
correction is advocated in these cases.

LABIAL FRENECTOMY (MAXILLARY)

Procedure-

- Cross-diamond excision:

i . This is done when there is lot of tissue is available. Here base of the frenum at the alveolar cre is grasped with haemostat and incision is taken abov and below the haemostat.

ii . The surgical defect is created by excision of fibrous band. The closure is done by interrupted sutures and small defect at alveolar crest is left to granulate.

Z- plasty:

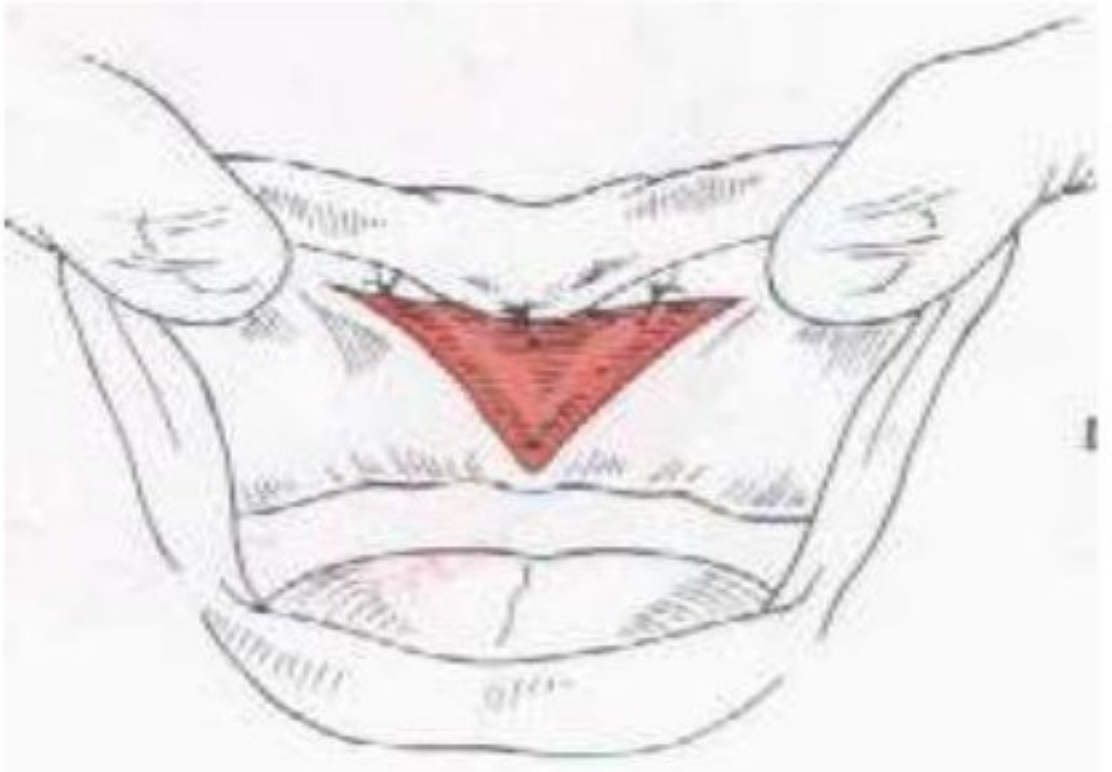
i. This procedure is used when the frenum is broad
nd the vestibule is short.

V-Y incisions:

i. These incisions are used for lengthening localize
rea.

Semi lunar incisions:

i. These incisions are used for broad premolar and
nolar region freni.

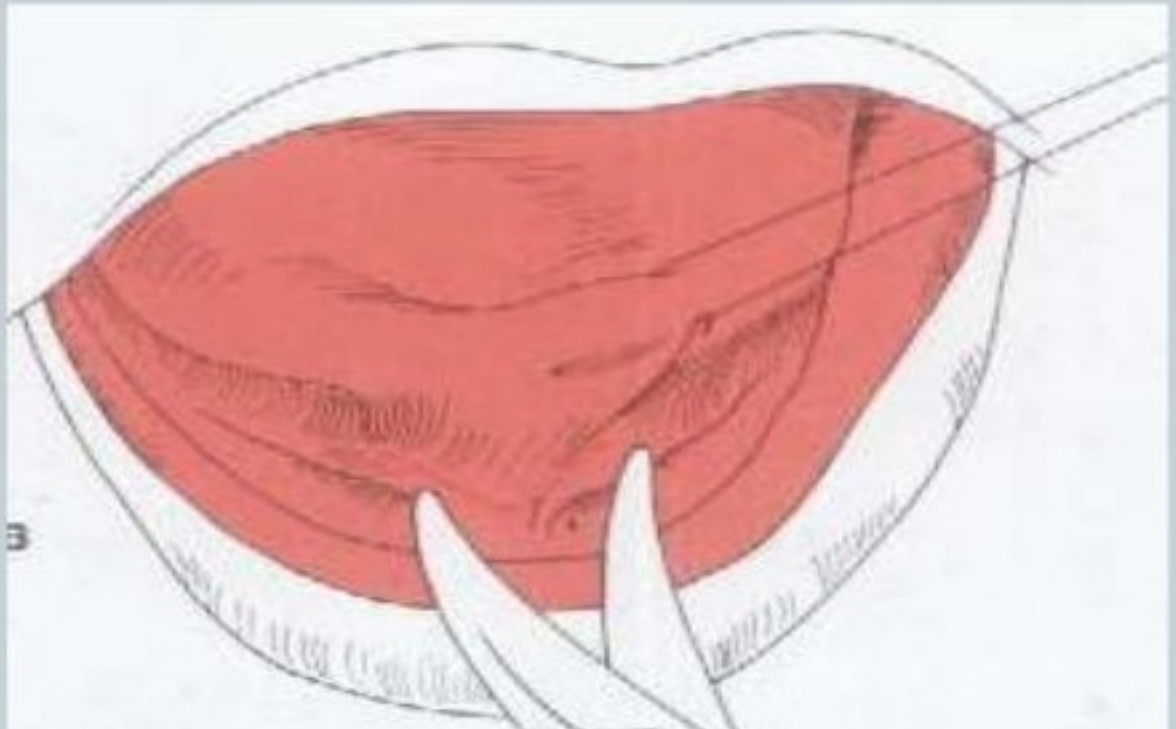


LINGUAL FRENECTOMY

ocedure:

Here lingual frenum is reduced by giving cross-diamond ncision.

After incision sub mucosal dissection is done on either sic nd vertical suturing is given.



EXCISION OF EPULIS FISSURATUM

These are the benign, pedunculated lesions present as excessive or redundant tissue of the vestibule, frequently associated with over extended denture border.

These lesions are removed by Sharpe excision, electro cauterization, cryosurgery or laser excision.

EXCISION OF PALATAL PAPILLARY HYPERPLASIA

This happens because of chronic denture irritation, becau
of ill-fitting dentures.

There can be superimposed Candida infection.

Denture should be relieved in this region and antifungal
agent should be applied.

Supraperiosteal excision with a electrocautary can be don

II. ALVEOLAR RIDGE EXTENSION

Whenever there is an inadequate vestibular depth presen due to mandibular atrophy and high muscle or soft tissu ttachment) so to increase retention and stability of lenture, deepening of vestibule is considered.

Sufficient amount of bone should be present (min 15mm one height) for alveolar ridge extension/ vestibuloplasty rocedure.

This procedure can be done in both jaws.

VESTIBULOPLASTY

Labial vestibuloplasty :

For mandibular ridge:

i. Kazanjian technique (1924).

ii. Godwin's modification (1947)

iii. Clark's technique

iv. Obwegeser's modification (1959)

For maxillary ridge:

i. Maxillary pocket inlay vestibuloplasty

Lingual vestibuloplasty:

i. Trauner's technique

ii. Caldwell's technique

zanjian technique:

Mucosal flap from inner aspect of the lower lip is used to ncrease the vestibular depth in anterior mandibular labia estibule (premolar to premolar region).

Raw area is left on the lip side to be healed by secondary ntentions.

Periosteum of bone is left intact.

Drawback – scaring of mucosa with subsequent decreased lexibility of lower lip.

dwin's modification:

n this procedure, flap is reflected from the inner aspect o
he lip till the alveolar crest and periosteum is reflected
rom crest of the ridge till the desired depth of the vestibu

This periosteum is now sutured to the lip mucosal margin
nd then lip flap is sutured at the required vestibular dep

Stent or splint is used for adaptation .

Advantage: less scaring of the lip mucosa.

ark's technique:

Here flap is reflected from alveolar crest till vermilian border of the lip.

Supraperiosteal dissection is done till desired vestibular depth and edge of the mobilized flap is pushed into vestibular depth.

This flap is held in position with sutures passed through the chin area extraorally and tied around the rubber catheter.

Here alveolar bone is covered by periosteum which heals quickly by granulation.

owegeser's modification:

Here everything is same but the only modification is that the alveolar bone with periosteal attachment is covered with the split thickness skin graft or mucosal graft.

axillary pocket-inlay vestibuloplasty:

Here incision is made in the vestibule from molar to mola
egion and supraperiosteal dissection is carried out.

Now a split thickness graft is placed on the extended
langes of prefabricated denture and this denture is
positioned in extended vestibular depth which is fixed wit
ircumzygomatic wiring.

Wound margins are sutured to the graft.

New denture will be constructed after 6 weeks.

Advantages:

- Better retention of the dentures.
- Helps to restore deficiency in the region of nasolabial fo

LINGUAL VESTIBULOPLASTY

auner's Technique:

- his procedure is used to increase the depth of floor of th nouth in mylohyoid region.
- ncision is given over lingual side of the alveolar ridge ilaterally in posterior region (2nd molar region).
- upraperiosteal dissection is done to identify mylohyoid nuscle, which is separated from its attachment and sutur o the new desired vestibular depth.
- kin graft is placed and sutured with the prefabricated ste ver it.

ldwell's Technique:

Entire lingual mucoperiosteal flap is reflected from molar
o molar region.

Mylohyoid and genioglosus muscle attachments are
lissected and sutured below to the desired depth of the
estibule.

Rubber tubing is placed in the lingual vestibule and the fl
s held in place at desired vestibular depth which is suture
with the sutures passing extra orally, at inferior border of
he mandible.

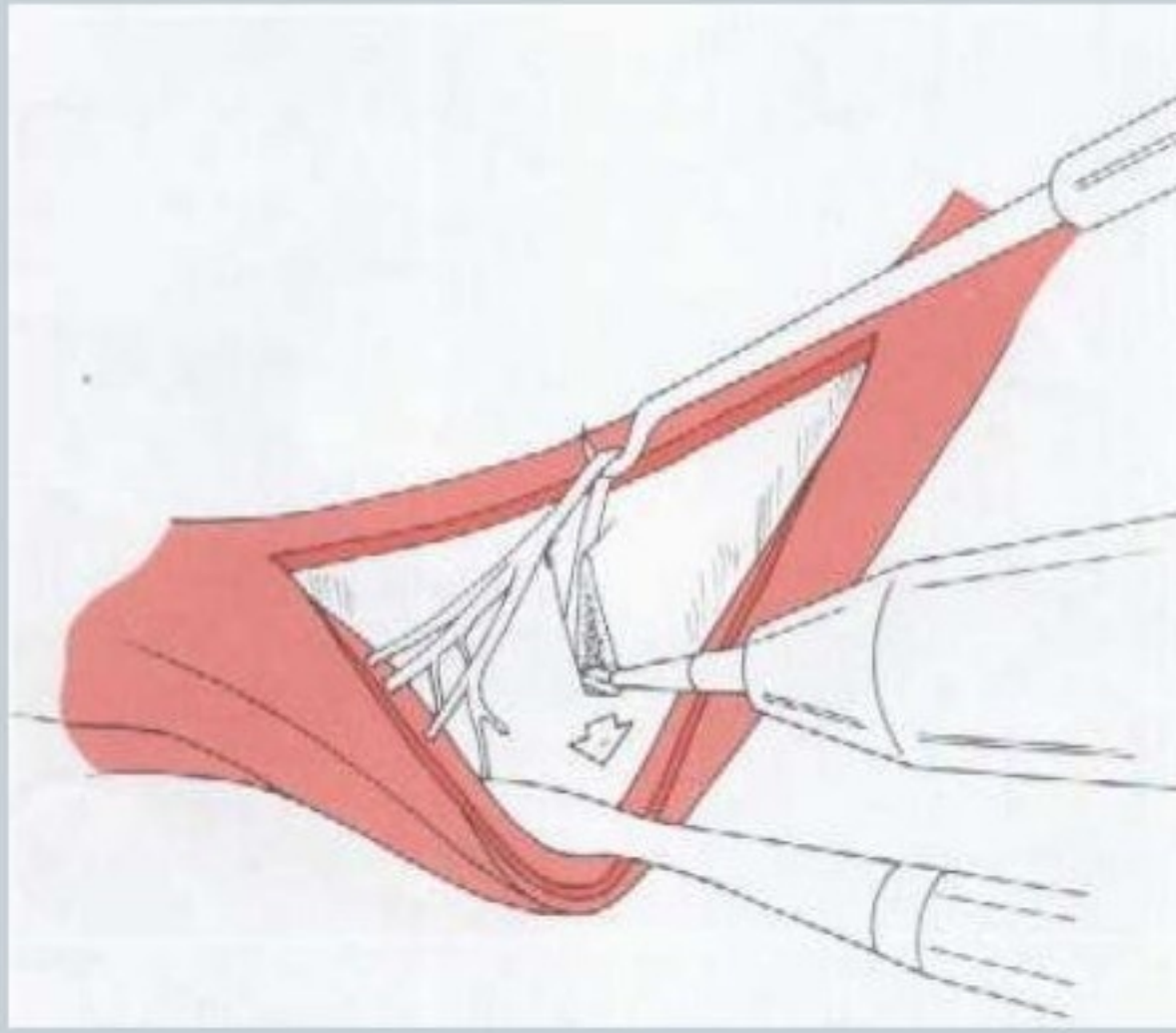
MENTAL NERVE TRANSPOSITION

Many times patient with severe atrophic ridge, complaint
of pain after wearing complete denture.

This is because that the position of mental nerve is superi
because of severe mandibular atrophy so this is the reaso
or pain on compression.

rocedure:

- Here the flap is reflected on buccal aspect in the mental nerve region.
- The nerve is held with the hook lightly and a bony groove is cut below mental foramen only in buccal cortex.
- Then nerve is positioned in that groove secured in place with gelfoam and flap is sutured.



III. ALVEOLAR RIDGE AUGMENTATION

This procedure is done when alveolar bone has been completely disappeared to the point where in maxilla a fl surface is present between vestibule and palate and in mandible mental nerve is positioned almost at the crest.

Here alveolar bone height is less that 15 mm.

So vestibuloplasty is out of consideration in this case unti the replacement of necessary supportive bone is done.

So we have two options available with us :

a) Augmentation of alveolar bone.

b) Place the implant.

ns:

- Restoration of optimum ridge height, width, ridge form vestibular depth and optimum denture bearing area.
- Protection of neurovascular bundle.
- Establishment of proper interarch relationship
- Improvement of retention and stability of denture.
- Improve the patient comfort for wearing the denture.

Materials used for ridge augmentation:

- Autogeneous bone graft: iliac crest, rib grafts.
- Allogenic bone grafts: freeze dried cadaver bone.
- Alloplastic material: hydroxyapatite.
- Metal mesh with autogenous cancellous bone.
- Metal mesh with hydroxyapatite.

RIDGE AUGMENTATION PROCEDURE

Superior border augmentation

Inferior border augmentation

Interpositional or sandwich bone grafts

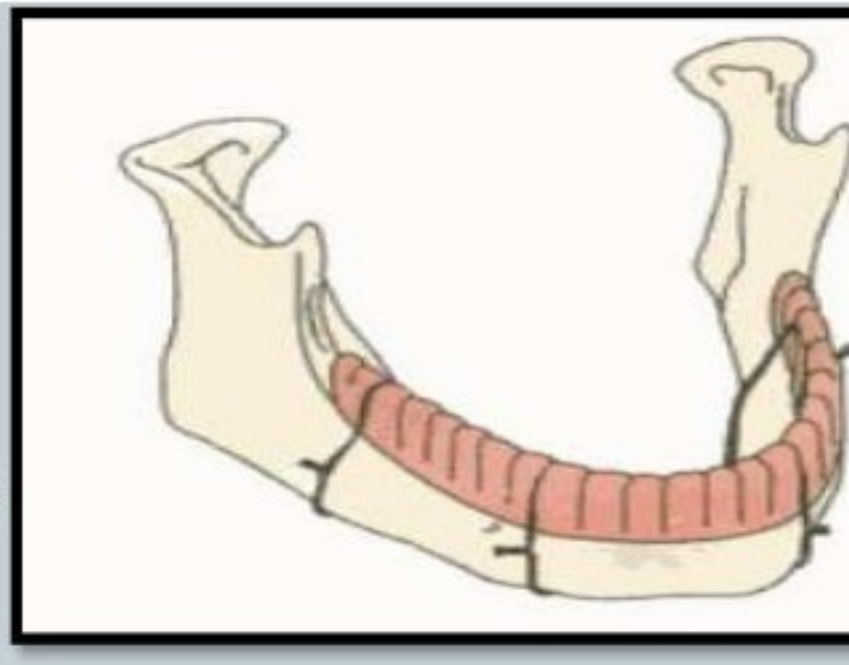
Onlay grafting

Visor osteotomy

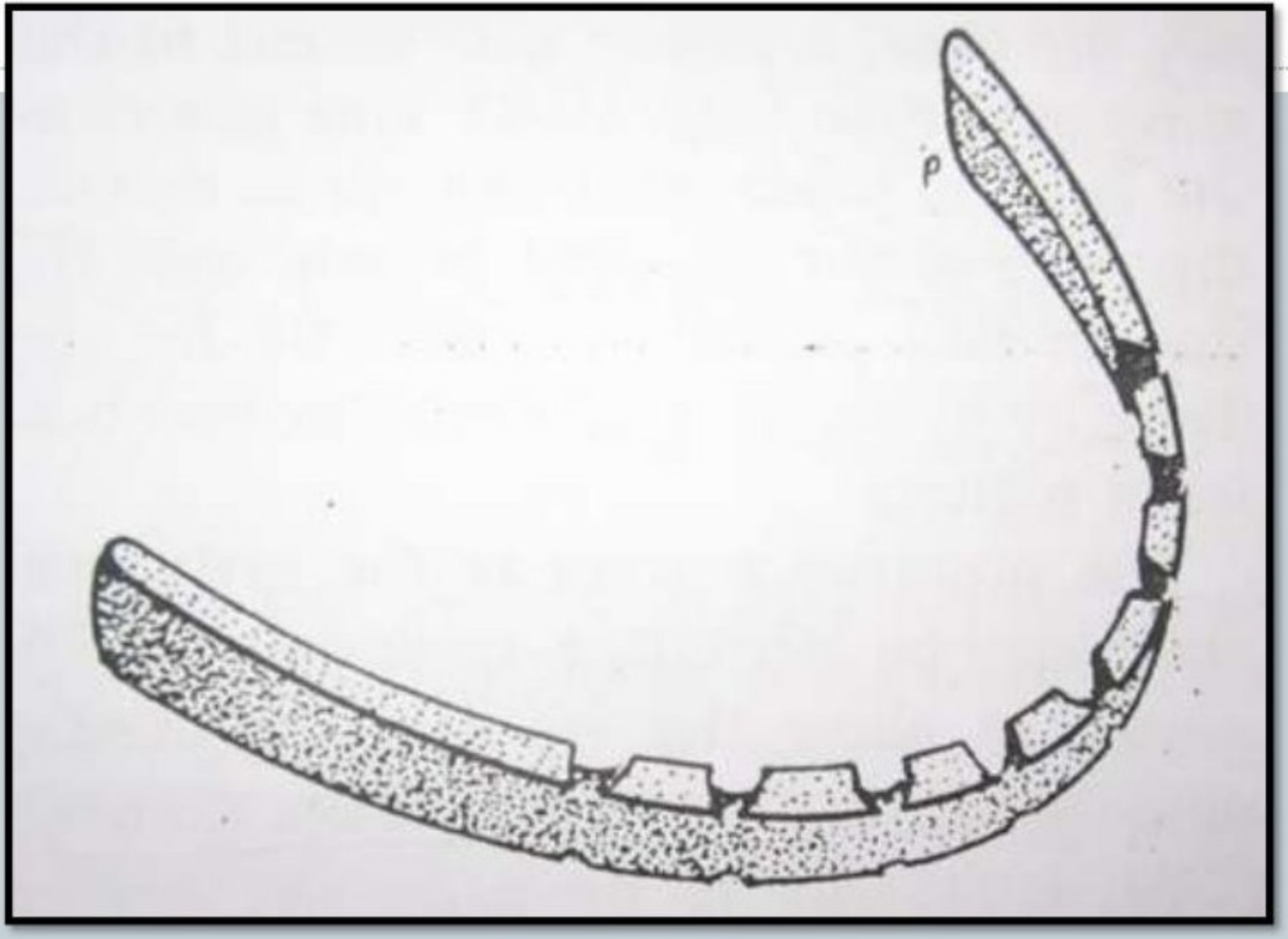
Modified visor osteotomy

MANDIBULAR AUGMENTATION

Superior border grafting:



- First described by Davis in 1970.
- Remaining bone < 10 mm
- Here two autogenous bone grafts of 15 cm each are used.
- One rib is scored to the cortex followed by giving shape of the mandible and attached at the superior border of the mandible by circummandibular wiring.
- The other rib graft is made into corticocancellous particles and moulded around the first rib graft.
- Surgical flap is then closed.



Kerfing of rib graft

sadvantages –

Donor site morbidity.

Second surgical site is necessary.

Continued resorption at the graft sites

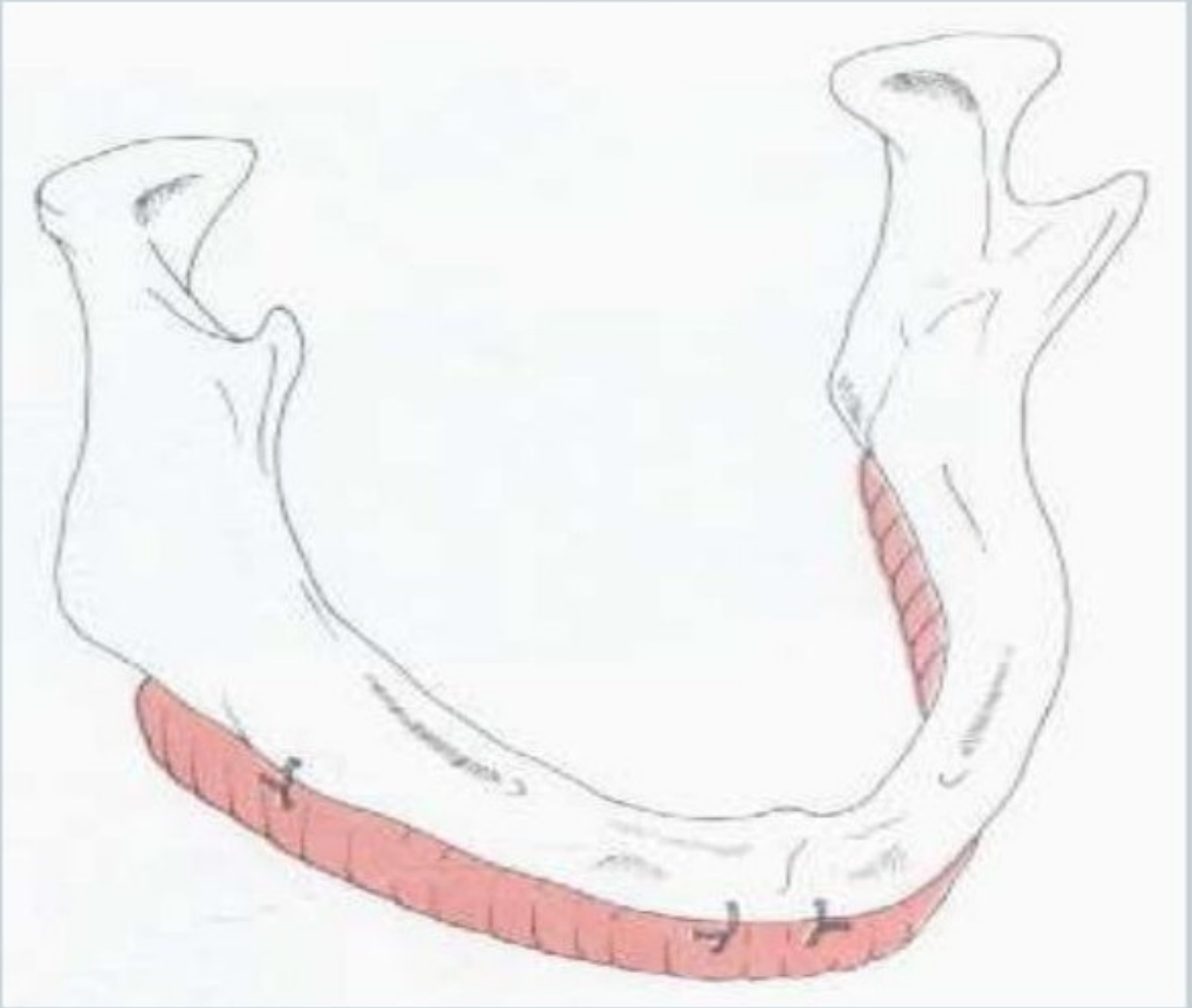
ferior border grafting:

is procedure is indicated when alveolar ridge height is les
han 5 to 8mm and is at risk of pathological fracture.

this procedure, a cadever mandible used for grafting whi
s filled with cancellous graft material for revascularizatio

is mandible is then fixed to the inferior border with vicry
utures, by circummandibular fixation and neck flap is
losed.

seointegrated implants can be placed after 4-6 months.



vantages

Does not obliterate the vestibule.

nterim denture can be worn.

No change in vertical dimension.

Graft is not subjected to direct masticatory force.

sadvantages:

t will not correct the abnormalities of denture bearing rea.

t will not protect a highly placed mental nerve.

Donor site morbidity.

Resorption of the graft.

Presence of scar.

GRAFTING)

n this procedure, a horizontal osteotomy is performed by
plitting of the maxilla or mandible and bone is grafted in
he gap.

n mandible, this procedure is mainly used in anterior
nandible.

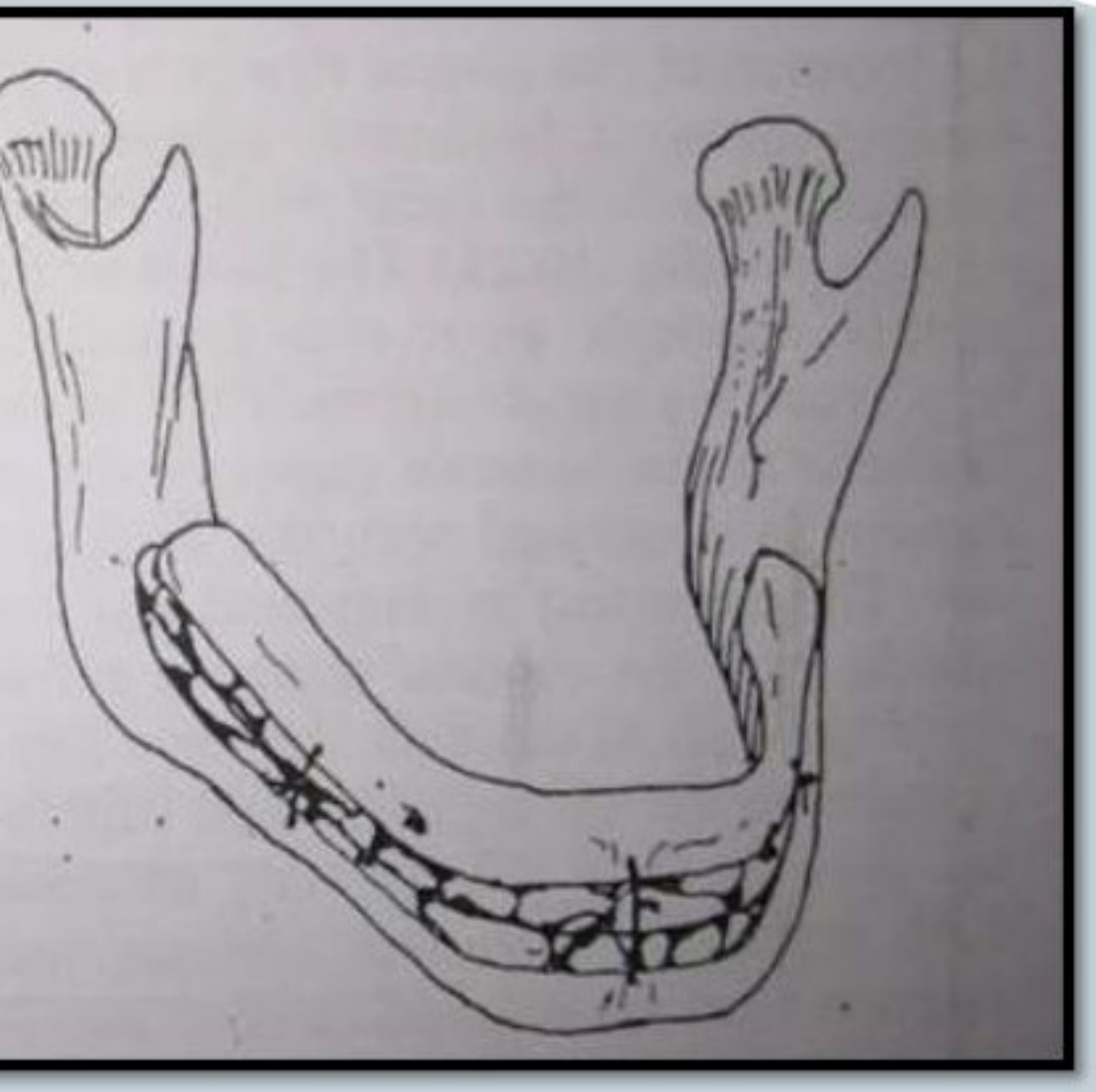
Prosthetic appliance is given after 3-5 months.

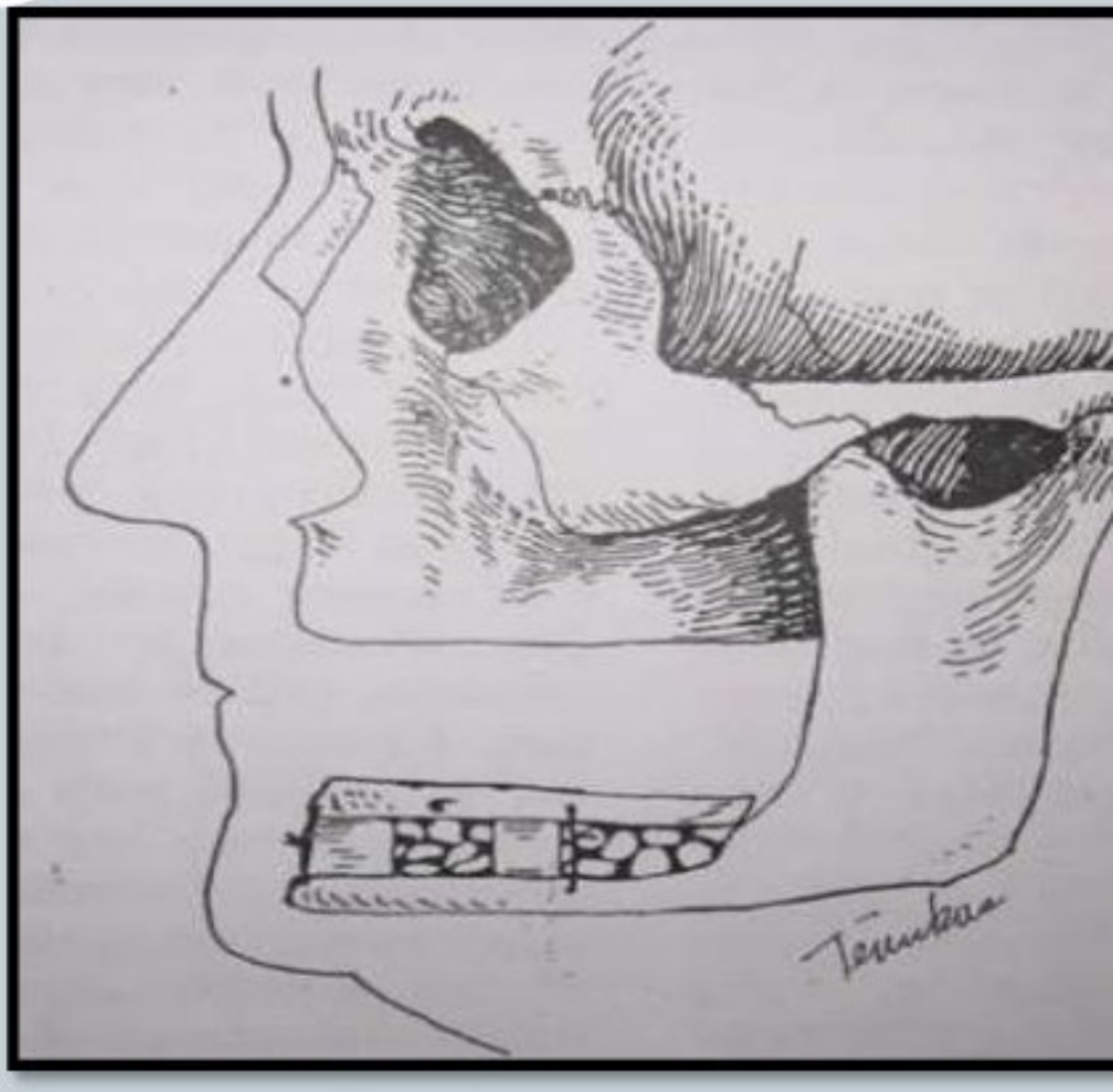
vantages:

Less resorption than onlay grafting.

More predictable long term results.

Decreased incidence of nerve paresthesia than the visor
steotomy.



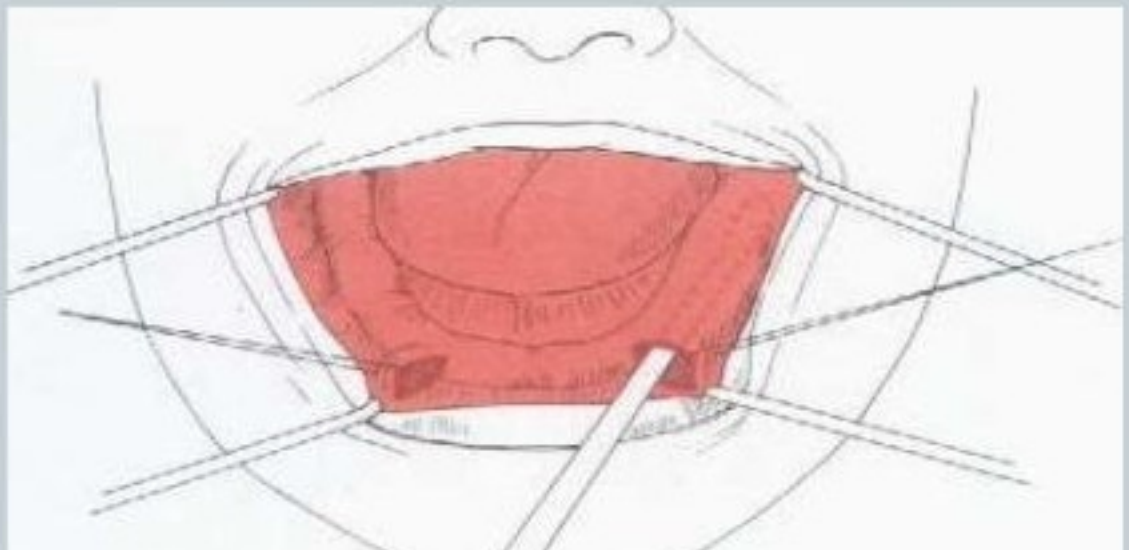


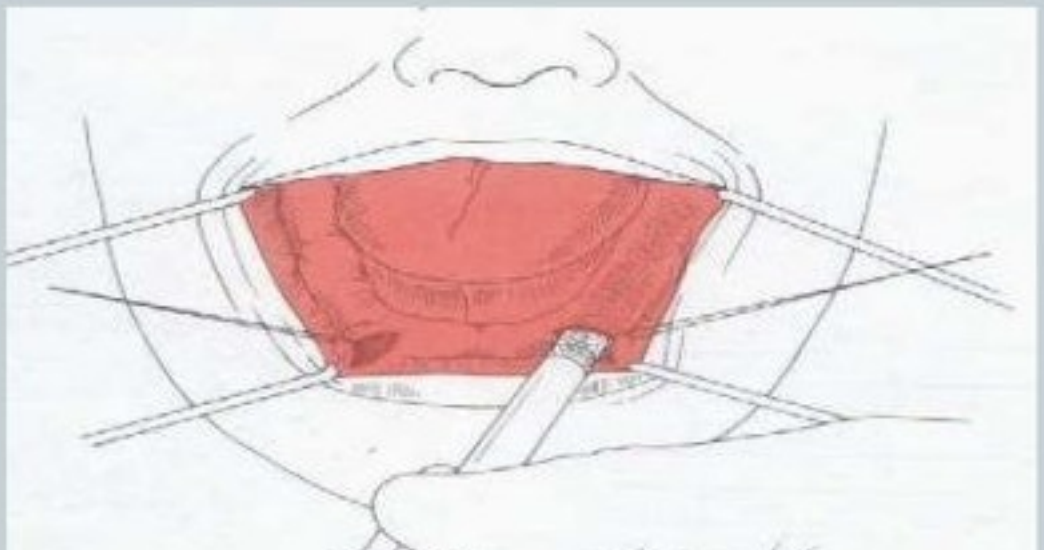
ONLAY GRAFTING

- This procedure helps in increasing width of the ridge.
- Here graft material is placed on the buccal cortex eithe in putty form by mixing with saline/blood or in the form of blocks or split thickness rib/illiac crest graft.
- Advantages:

✓ Improves width and to some extent height too.

✓ Can be used in anterior and posterior region.

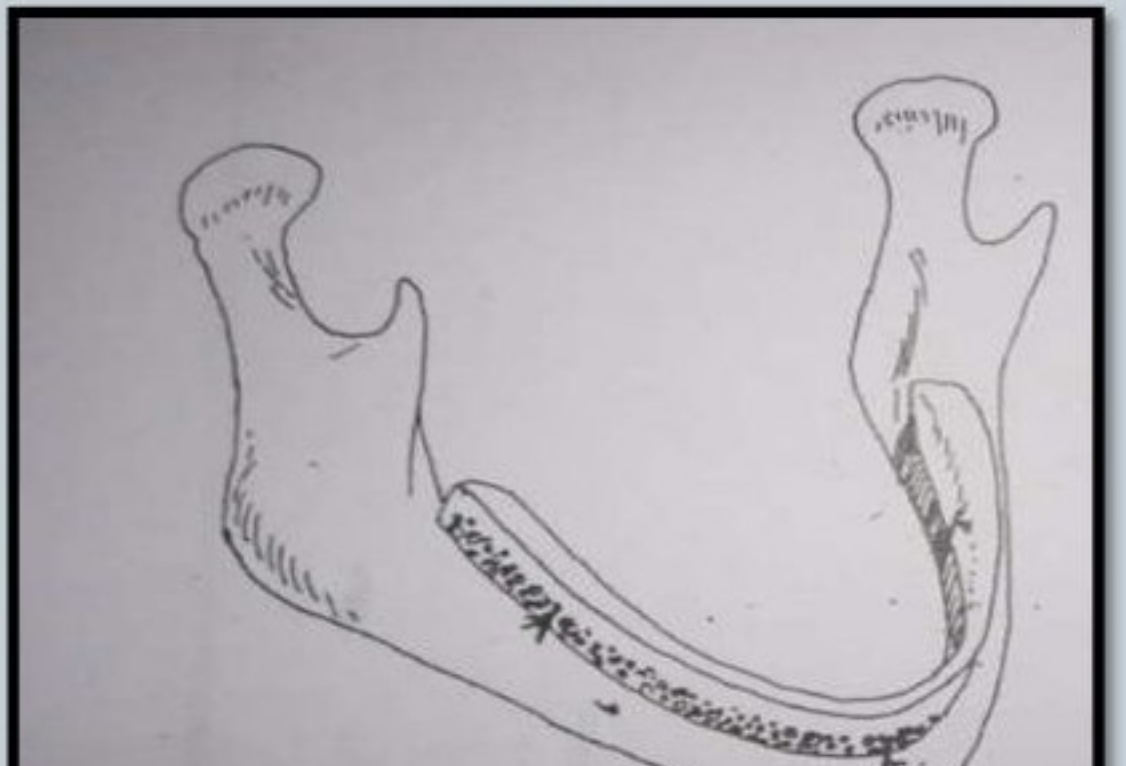




VISOR OSTEOTOMY

Was originated by Harle and modified by Peterson ar
Blade.

t is used where insufficient vertical mandibular bone
eight is present for the horizontal osteotomy technic
out adequate bone width (approximately 10mm) is
resent.



The mandible is split vertically and the lingual sectio
s elevated to increase the mandibular height.

Cancellous bone or particulate bone and marrow is
laced to correct the contours and fill in the gaps on
he facial side of the elevated segment.

Transosteal wires hold the segments in place for a
eriod of 3-4 months before vestibuloplasties are
erformed.

The disadvantage is unavoidable nerve trauma and the
esultant parasthesia.

MODIFIED VISOR OSTEOTOMY

The procedures of choice for mandibular ridge augmentation include the combination of osteotomy techniques (horizontal or vertical) with interpositional bone grafting.

These procedures involve the movement of a pedicle of bone (not technically a graft) along with its blood supply.

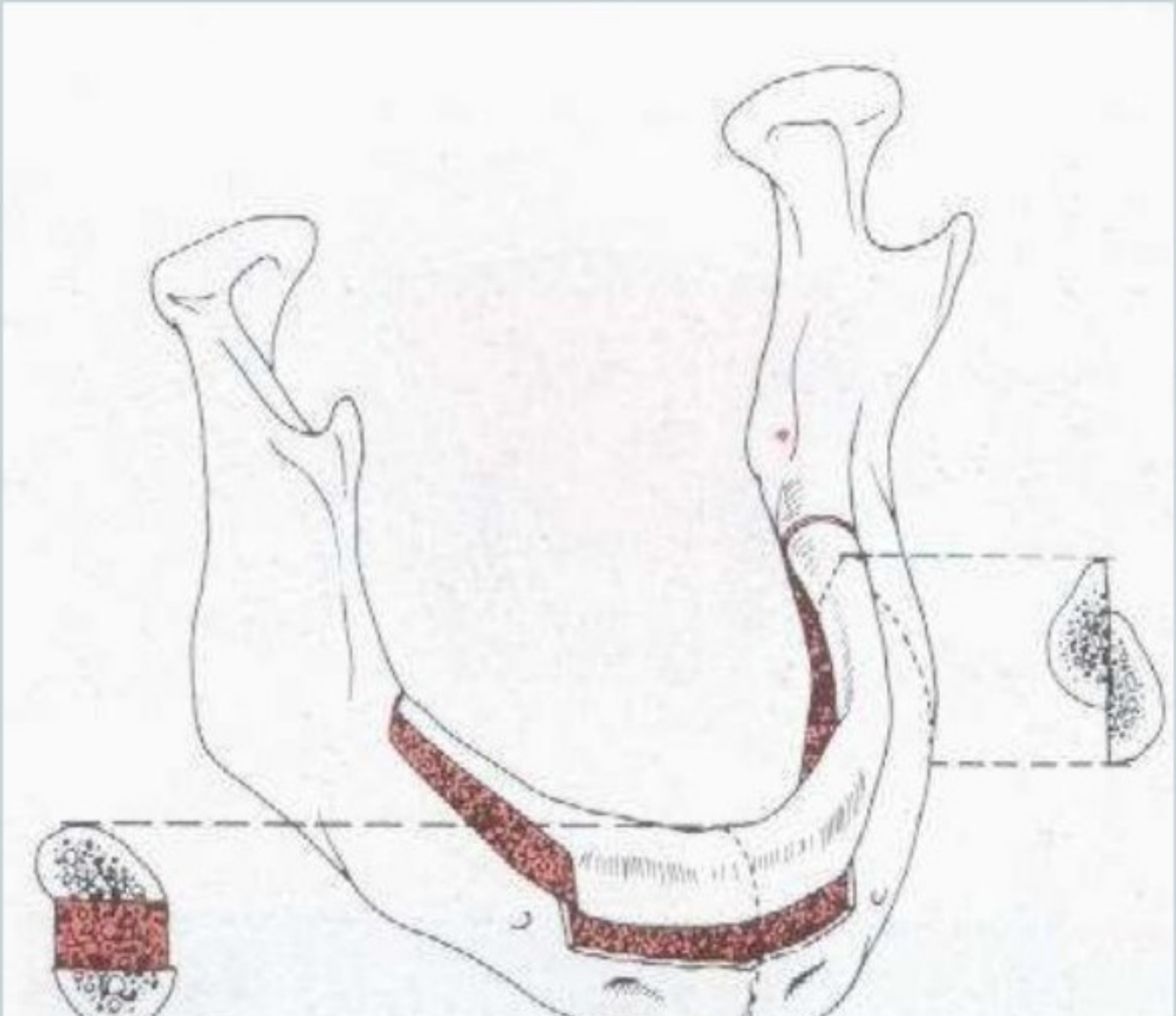
Theoretically, the viability of the bone will be greater and the resorption decreased because the blood supply to the bone is maintained.

ocedure:

Vertical osteotomy cut is made in the posterior region to
livide the segments buccolingually.

A horizontal osteotomy is performed in the anterior
nandible to divide the anterior segment superiorly and
nferiorly, and bone grafting was done into the
steotomised gap.

Two osteotomised segments are fixed with wires.



vantages:

- Increased bone height which is relatively stable.
- Shortened post-operative period (3 months).
- Rate of resorption is less when compared to onlay graft

sadvantages:

- Nerve trauma
- Parasthesia
- Mandibular fracture
- Flap dehiscence.

AUGMENTION PROCEDURE

Inadequate soft tissue cover.

Rejection of the auto grafts (failure of union with the ho bone).

Dehiscence of overlying mucosa.

Migration of the graft material.

Resorption of the graft.

CONCLUSION

Accurate diagnosis of the problem areas during dentu
onstruction and determination of the necessity of surge
s accomplished by careful evaluation of the informati
ystematically obtained from the patient.

As conservation is the philosophy of surgical patie
nanagement. Therefore every attempt should be made
reserve as much as oral structures as possible.

Proper knowledge of the available surgical procedu
elps in achieving the best results.

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THANK YOU