INCISIONS IN ORAL & MAXILLOFACIAL SURGERY

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JR2

- Incision is defined as " a cut or wound deliberately made by an operator in the skin or mucosa using a sharp instrument, surgical blade, cautery etc. so that the underlying structure can be exposed adequately for surgical access."

- Incisions are placed to drain abscess, excise growths, mobilize tissue and create access to the deeper viscera.

- A scalpel is used to make an incision.

BASIC PRINCIPLES OF INCISION MAKING

- A sharp blade of an appropriate size and number should be used for making an incision. A sharp blade allows incisions to be made cleanly without unnecessary damage to the tissues due to repeated strokes.
- The Bard Parker blade is mounted on the suitable handle (e.g. no. 15 blade and no 3 handle).The surgeon holds the knife with a pen grip which provides better support to the hand and control over the knife.

- Incision should be given using continuous and controlled pressure and with a single stroke. As one approaches towards the end of the incision the direction of the knife should change from oblique to right angle so that the skin and deeper tissue are incised at the same level.
- An incision should always be deepened layer-wise. A full thickness incision through multiple layers, in a single stroke should be avoided to avoid injury to the deeper vital structures.

- Incisions on epithelial surfaces should always be made with the blade held perpendicular to the surface. This creates wound edges which are easier to re-approximate and less susceptible to necrosis.
- While placing incisions on the skin, the skin should be stretched between the thumb and index finger of the other hand to allow a clean incisions.
- Mucosal incisions in the oral cavity should always be made resting on healthy bony tissue so as to provide a healthy base for support of the sutured margins

- Incisions extending to the marginal and papillary gingiva should be so designed that they do not cut through the papilla or the marginal gingiva.
- Extra-oral incisions in the head, neck and face region should be given along the existing resting skin tension lines and should not cross them as far as possible.
- Use as long incisions as needed.

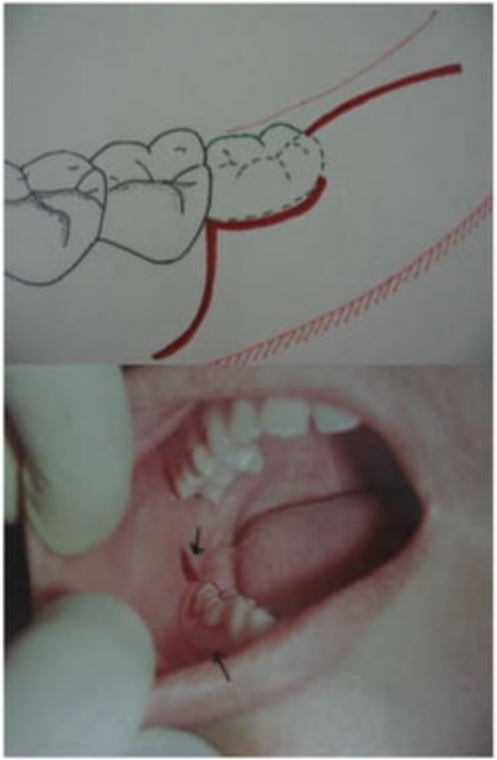
INCISIONS USED IN ORAL & MAXILLOFACIAL SURGERY

- Intra-oral as well as extra-oral incisions are used in management of various pathologies in the field of Oral & maxillo-facial surgery. Each incision used is designed based on the basic principles of surgery and is indicated for management of specific conditions.

INTRAORAL INCISIONS

WARD I

- It consists of mesial release, crevicular and distal release incisions.
- Mesial release incision begins from approximately 5-6 mm below marginal gingiva of lower second molar at the mesial root and runs upwards obliquely at an angle of 45º to the distobuccal line angle of the second molar and extends posteriorly cutting the distal papilla and then into the crevice of the third molar if partially erupted and then distally it extends on the anterior border of the ramus of the mandible for a distance of 10 mm.



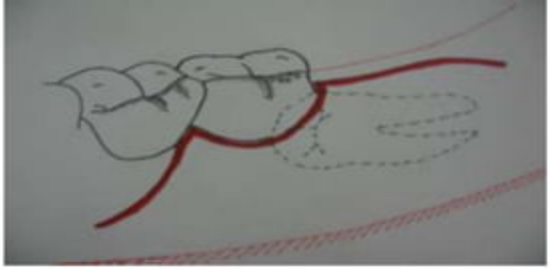
Indications:

- Transalveolar extractions of the lower third molar which are partially erupted with adequate depth of buccal vestibule.

Precautions:

- Mesial release should not extend too inferiorly to avoid cutting the facial artery.
- Distal release should not be lingually oriented to avoid damaging the lingual nerve or minor bleeding encountered due to presence of nutrient vessels.
- Distal release should be 10 mm long to avoid cutting through the the tendinous insertion of temporalis or the fibers of the masseter muscle or hearniation of buccal fat pad in the oral cavity.

WARD II



- It consists of mesial release, crevicular and distal release incisions.
- Mesial release incision begins from approximately 5-6 mm below marginal gingiva of lower first molar at the distal root and runs upwards obliquely at an angle of 45° to the mesiobuccal line angle of the second molar and extends distally into the crevice of the second molar up to its posterior surface and then distally it extends on the anterior border of the ramus of the mandible for a distance of 10 mm.

Indications:

- Transalveolar extractions of the lower third molar which are completely unerupted and inadequate depth of buccal vestibule.

Precautions:

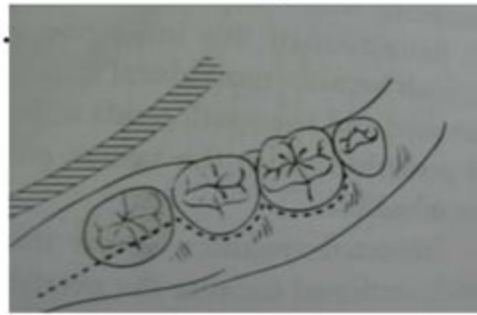
- Similar precautions are warranted as mentioned for the Ward I incision

SULCULAR INCISION

a) Second molar sulcus incision: Incision starts on the ascending ramus following the center of the third molar shelf to the distobucal surface of the 2nd molar and then extends as a sulcular incision to the mesiobuccal corner of the 2nd molar

Indications:

- Used for transalveolar extraction of most mesially inclined and superficial impactions.



b) Second and first molar sulcus incision: This incision is similar to the second molar sulcus incision only difference being that the sulcular incision is extended to the mesiobuccal suface of the 1st molar.

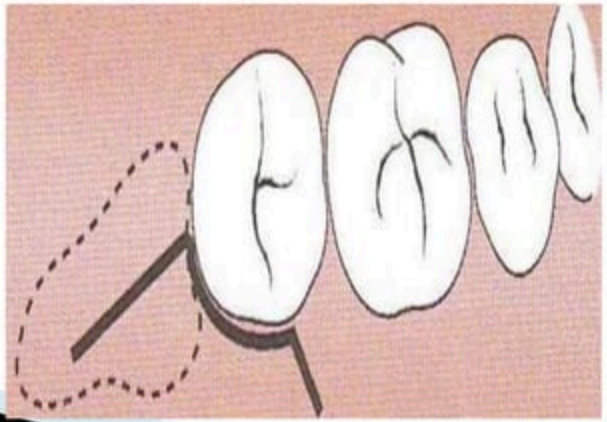
Due to extra extension, it gives a better exposure.

Indications:

- It is used in 3rd molar surgeries when the molar is more lingually situated.

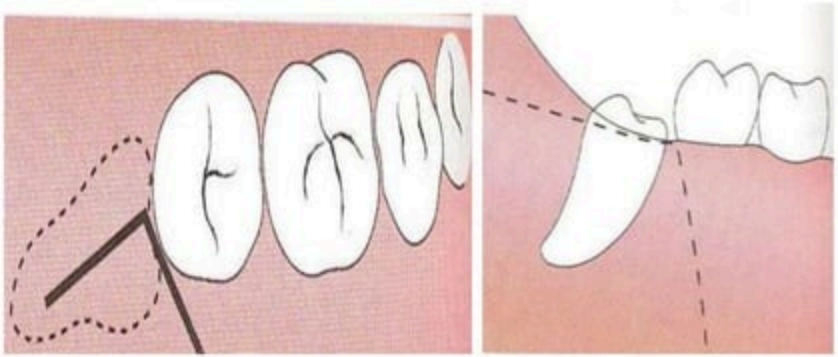
c) Second molar sulcus incision with vestibular extension (Bayonet flap): The incision is similar to the second molar sulcus incision with the addition of an oblique vestibular extension in the sulcus area which is angled forward.

This gives excellent buccal visibility.



d) Second molar paramarginal flap with vestibular extension (L flap): It is similar to the bayonet flap only difference being that the incision is made a couple of millimeters away from the marginal gingiva.

It optimizes marginal attachment healing next to the second molar.



e) Lingual flap incision: It starts on the ascending ramus upto the distobucal surface of the 2nd molar and follows the distal surface of the 2nd molar as a sulcular incision and then continues lingually to the 1st molar region.

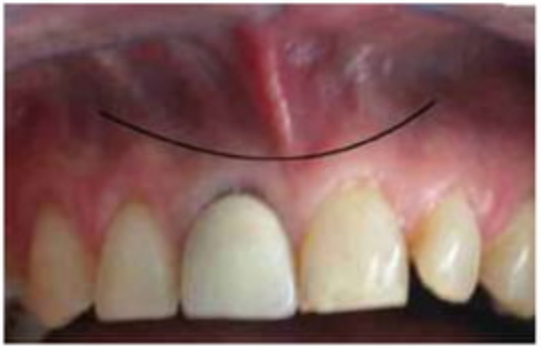
Indications:

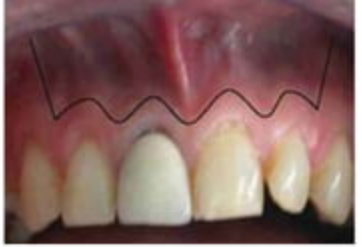
- It is used for Lingual split technique of transalveolar extraction of mandibular 3rd molars.

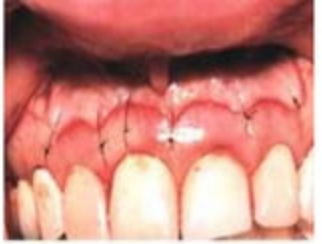
f) Semilunar incision: It is a slightly curved half-moon shaped incision in the alveolar mucosa.

Indications:

- It is used for apicoectomy of teeth and apical curettage.
- It can be used for transalveolar removal of retained fractured apical portion of tooth roots.







g) Submarginal incision: It has its horizontal component in the attached gingiva with accompanying vertical release incisions. The horizontal incision can be scalloped to conform to the shape of the marginal gingiva. It requires at least 4mm of attached gingiva.

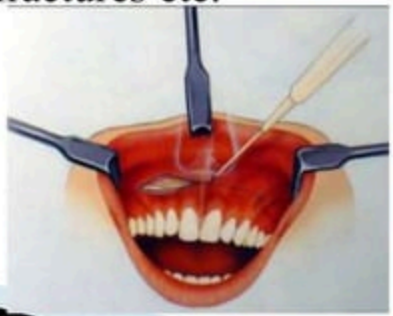
Indications:

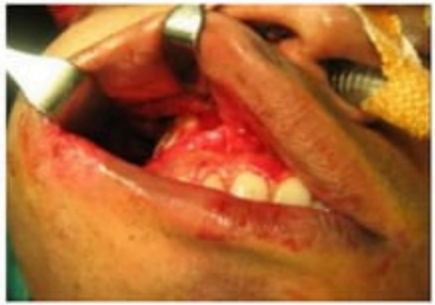
- It is used most commonly in cosmetically important areas such as maxillary anterior teeth for access to the periapical areas of the tooth.

h) Degloving incision: The incision is usually placed approximately 3 to 5 mm superior to the mucogingival junction. Leaving unattached mucosa on the alveolus facilitating the closure.

Indications:

- It is used to access the pyriform aperture region anteriorly and Zygomatic buttress posteriorly.
- This incision is used for various surgical procedures performed in the maxilla such as Infra orbital nerve neurectomy, Caldwel- Luc's operation, Le-fort osteotomes, low level maxillectomy, fixing of Le-fort I, II fractures, zygomatic bone fractures etc.



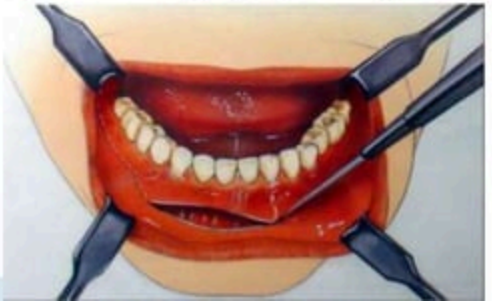


i) Curvilinear incision: It is used in the mandibular anterior region in the inter mental foramina region.

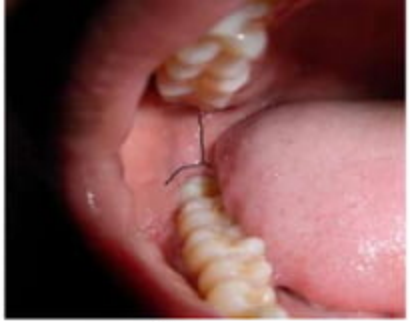
- It extends anteriorly out into the lip, leaving 10 to 15 mm of mucosa attached to the gingiva. Once through the mucosa, the underlying mentalis muscles are clearly visible. The muscle fibers are sharply incised in an oblique approach to the mandible.
- When bone is encountered, an ample amount of mentalis muscle should remain on its origin for holding deep sutures at closure. In the body and posterior portion of the mandible, the incision is placed 3 to 5 mm inferior to the mucogingival junction. Leaving unattached mucosa on the alveolus facilitates closure

Indications:

- For open reduction of mandibular fractures of the symphysis and parasymphysis.
- For harvesting cortico-cancellous graft from symphysis region



GINWALLA'S INCISION



- It is placed on the anterior border of the ascending ramus of the mandible and extends both lingually and buccally to end in a 'Y'. It provides better exposure of the inferior alveolar nerve for its avulsion.

Indications:

- It is used for the inferior alveolar nerve neurectomy for management of trigeminal neuralgia

EXTRAORAL INCISIONS

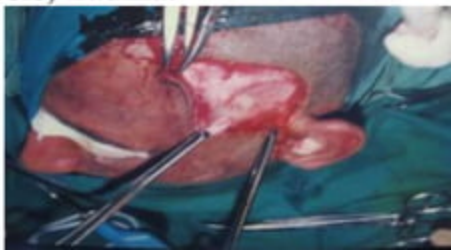
CORONAL APPROACH

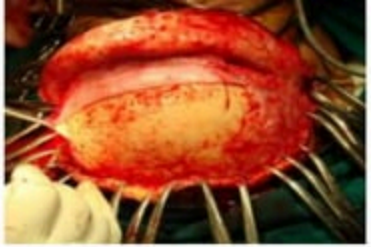
a) Unicoronal approach:

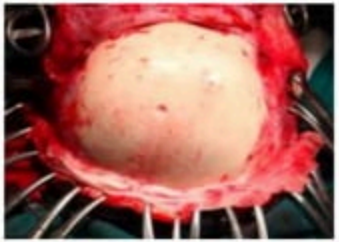
- The incision is made through skin, subcutaneous tissue, and galea revealing the subgaleal plane of loose areolar connective tissue overlying the pericranium.
- The coronal incision can be extended inferiorly, to the level of the lobe of the ear as a preauricular incision to allow exposure of the zygomatic bone and arch, fronto-zygomatic suture, temporomandibular joint (TMJ).

Indications:

- Used for exposure of Fronto-Zygomatic suture, superior orbital rim, lateral orbital wall, zygomatic arch, for management of unilateral midface fractures.
- For exposure of TMJ in management of ankylosis, trauma.







b) Bicoronal approach

- The incision first begins at one superior temporal line to the other temporal line. (hair band incision) The incision is made through skin, subcutaneous tissue, and galea revealing the subgaleal plane of loose areolar connective tissue overlying the pericranium. At the temporal line the incision is carried in the temporalis fascia to maintain the subgaleal plane and extended in the preauricular crease up to the lobule of the ear on both sides.

Indications:

- Used for exposure of Fronto-Zygomatic suture, superior orbital rim, lateral orbital wall, naso-ethmoidal area, zygomatic arch, for management of bilateral midface fractures.
- For exposure of TMJ bilaterally, in management of ankylosis, trauma.

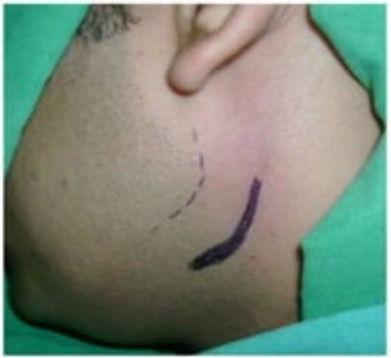
TRANSFACIAL APPROACHES TO THE MANDIBLE

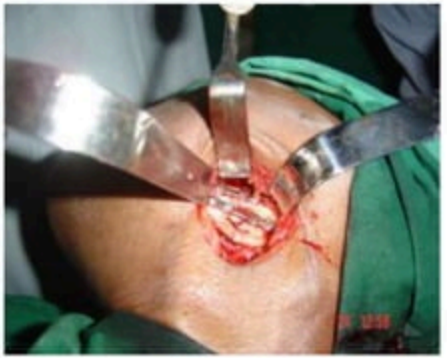
a) Submandibular approach- the incision is placed approximately 2 finger breadths or 1.5 - 2 cm below the inferior border of the mandible to avoid injury to the marginal mandibular nerve.

The skin creases below the mandible do not parallel the inferior border of the mandible but run obliquely, posterosuperiorly to anteroinferiorly.

b) Risdon's Submandibular Approach

- placed approximately 2 fingerbreadths or 1.5 - 2 cm below the inferior border of the mandible mandible to avoid injury to the marginal mandibular nerve and it curls around the angle of the mandible.





Indications:

- Extra-oral approach to mandibular angle and ramus region.
- In management of cysts and tumors of the mandible not amenable to transoral approach.
- In management of low condylar fractures (provides poor access).

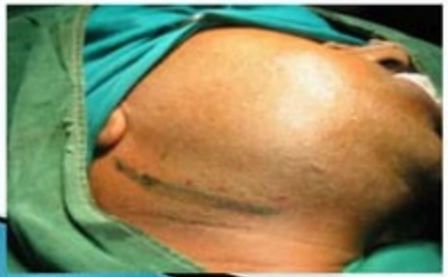
Precautions:

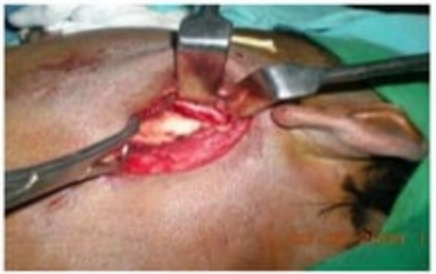
- Incision should be 1.5 – 2 cm below inferior border to avoid injury to marginal mandibular branch of the facial nerve.
- Facial artery should be palpated before hand to avoid accidental injury.
- Preferably, incision should be placed in the neck crease to avoid ugly perceptible scar.

c) Retromandibular incision: The incision for the retro-mandibular approach begins 0.5 cm below the lobule of the ear and continues inferiorly 3 to 3.5 cm.

- It is placed just behind the posterior border of the mandible and may or may not extend below the level of the mandibular angle, depending on the amount of exposure needed.
- **Indications:**

- Surgeries of the condylar neck and ramus.





TRANSFACIAL APPROACHES TO MID FACE

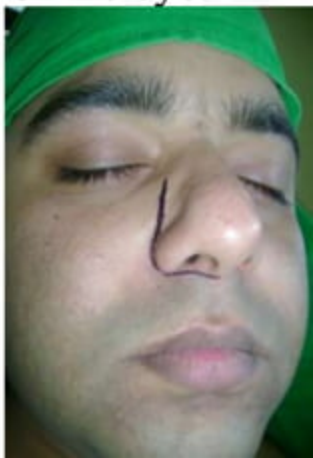
a) Lateral rhinotomy

- The incision begins from the columella laterally along the vestibule of the nose and then follows the ala of the nostril and extends along the lateral aspect of the nose to end a centimeter below the inner canthus of the eye.

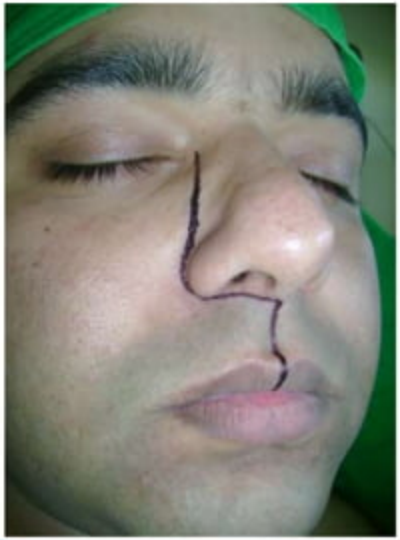
Indications:

- Access to the nasal cavity,

for open rhinoplasties and maxillary antrum.

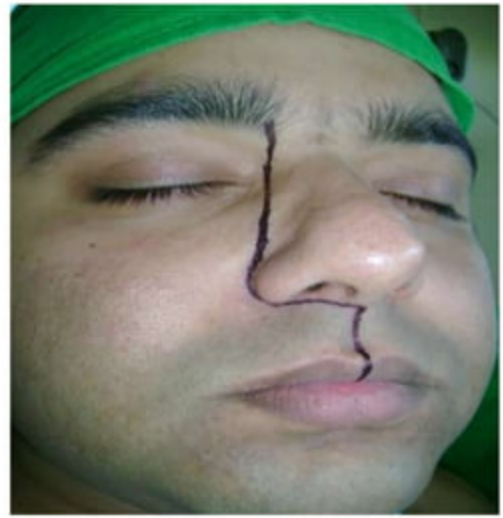


b) Diffenbach's extension: The basic advantage of Diffenbach extension is that it is used for low level subtotal maxillectomy, wedge maxillectomy. It is similar to the lateral rhinotomy incision with the difference being that in this incision the upper lip is split in the area of philtrum.

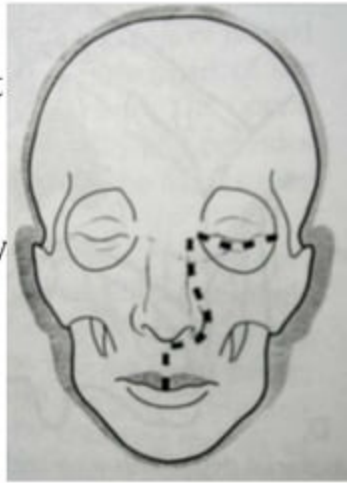


c) Weber- Fergusson incision with Lynch extension:

- **Lynch's extension:** It is an extension on the medial side from the medial canthus to the medial end of the upper eyebrow. (Fig 3.19)
- **Indication:** It is used for extended maxillectomy and access to the medial orbital wall.



d)Weber-Fergusson incision with subciliary extension: It is an extension of the lateral rhinotomy incision where in inferiorly it extends from the columella to divide the upper lip in the midline. Superiorly it is 6 – 8 mm medial to the medial canthus, the incision extends laterally, not creating a sharp angle but forming a rounded curve to avoid necrosis of the tip of the flap and causing a button like dehiscence.



- The infrorbital extension runs in the crease below the inferior palpebra upto the lateral canthus. A modification for esthetic reasons is that the incision extends into the floor of the nasal cavity from the columella leaving a 60° notch in the nasal floor where the triangular portion of the upper lip is inserted during closure.

Indications:

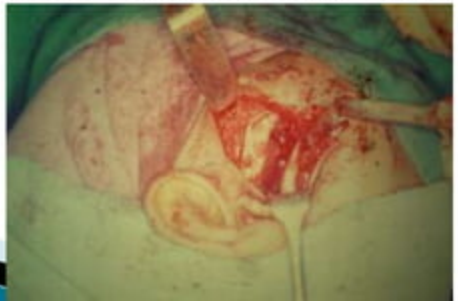
- Used for access to the maxilla for partial, subtotal or total maxillectomy.

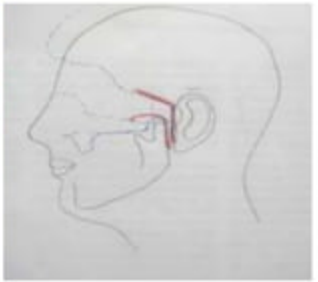
APPROACHES TO THE TMJ

a) Preauricular Incision: It is given in the pre-auricular crease at the junction of facial skin and helix of the ear for the entire length of the attached portion of the pinna. Modifications were suggested to this standard incision such as Blair & Ivy's 'Inverted Hockey stick incision' and Thoma's ' vertical angulated incision'.

Indications:

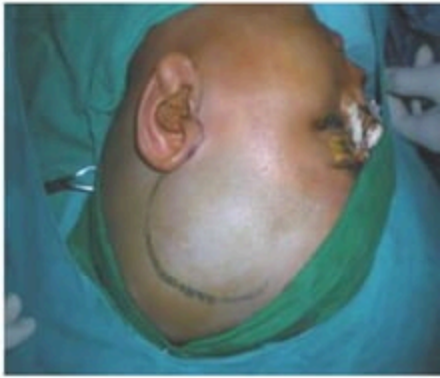
- For exposure of the condyle and condylar neck of the TM joint.

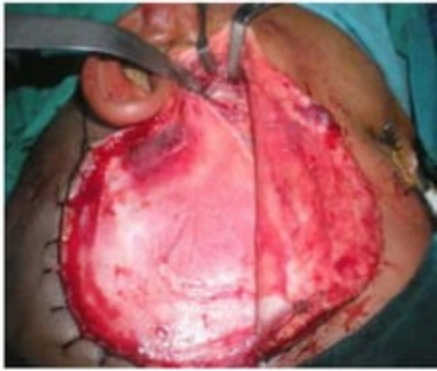




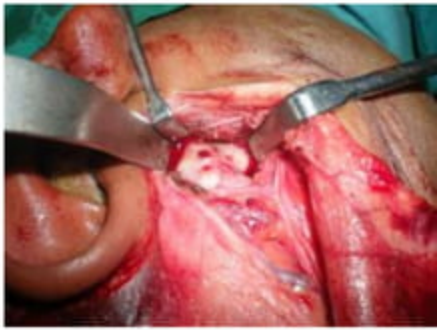
b)Al-Kayat Bramley's incision : It is inverted question mark incision. It is an extension of the standard preauricular incision where in the preauricular incision is extended superiorly and posteriorly around the attachment of the Temporalis muscle in an inverted question mark fashion.

- The skin incision is question mark shaped and begins about a pinna's length away from the ear, antero-superiorly just within the hair line and curves backwards and downwards well posterior of the main branches of the temporal vessels till it meets the upper attachment of the ear. The incision then follows the attachment of the ear.





- The temporal incision must be carried through the skin and superficial fascia to the level of temporal fascia.
- Blunt dissection in this plane is carried downward to a point about 2cm above the malar arch where the temporal fascia splits
- Starting at the root of the malar arch, an incision running at 45° upwards and forwards in made through the superficial layer of the temporal fascia.
- Proceeding downwards from the lower border of the arch and articular fossa, the tissues lateral to the joint capsule are dissected and retracted. The base of the neck of the condyle can be exposed. The bifurcation of the facial nerve is not nearer than 2.4 cm in an anterior-posterior direction from the post-glenoid tubercle. Care is needed not to extend deep dissection below the lower attachment of the ear.



Advantages of Alkayat Bramley incision:

- There is minimal bleeding and less sensory loss. The posterior placement of the skin incision and it's wide backwards and upwards sweep spares the major branches of the vessels and nerves
- Facial plane can be easily identified
- There is excellent visibility.
- The potential complications of muscle herniation and fibrosis are avoided. The muscle is never exposed and the superficial layer of the temporal fascia can be closed without tension.
- There is remarkably little post operative discomfort or swelling
- A good cosmetic result is achieved
- The technique is easily teachable and speedily executed.

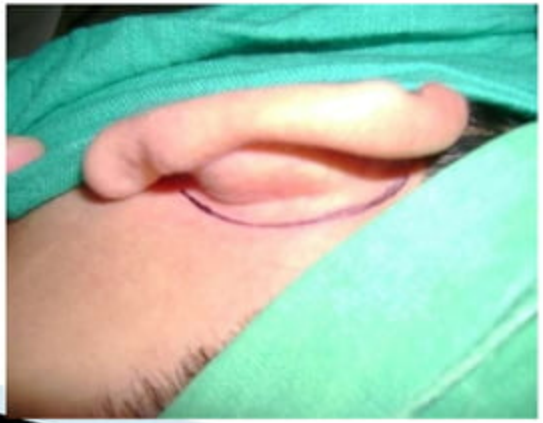
Indications:

- Exposure of the Condyle for surgeries of the TMJ
- Might also provide exposure of the Coronoid process.
- Allows harvesting of the Temporalis flap in gap arthroplasty.
- Provides exposure to the Zygomatic arch.

c) **Postauricular approach** : The incision is placed posterior to the pinna in the retroauricular crease. It is cosmetically viable incision.

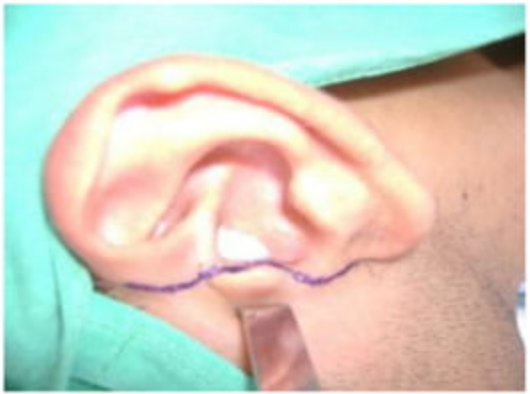
Indications:

- Exposure of the condyle for surgeries of the TMJ

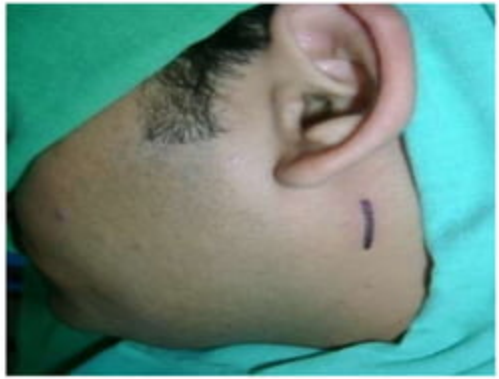


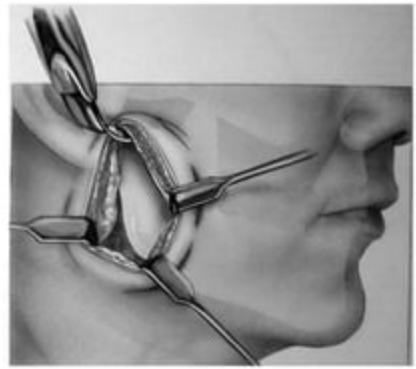
d) Endaural approach: The incision begins above the level of the Zygomatic arch and extends downward and backward into the intercartilagenous cleft between the tragus and the helix and then extends inwards along the roof of the auditory meatus for approximately 1 cm.

- **Indications:** Used for exposure of the condyle for surgeries of the TMJ.



e) Post-Ramal (Hind's) approach: A modification to retromandibular incision where in the incision is placed at the posterior ramus, just below the earlobule; the advantage being direct access to the posterior border of the ramus.

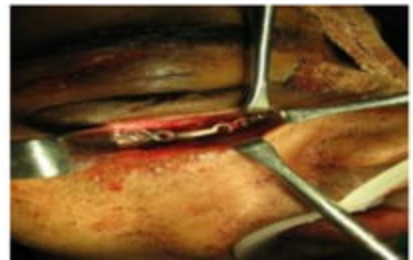




INCISIONS AROUND THE ORBIT

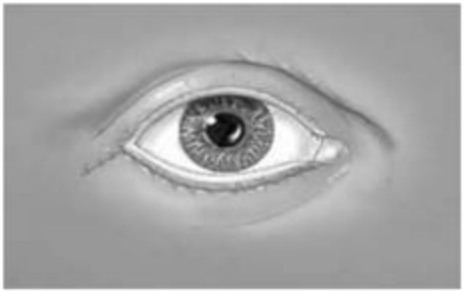
a)Infra-orbital incision : Infra-orbital incision is placed on the skin in the skin crease along the infra-orbital ridge from the medial canthus to the lateral canthus. If an extension is required in the lateral side it should be along the line of minimal skin tension along the zygomatic bone

- **Indications:**
  - Exposure of infra orbital ridge during fixing the zygomatic bone and Le-fort II fractures.
  - Exposure of the orbital floor



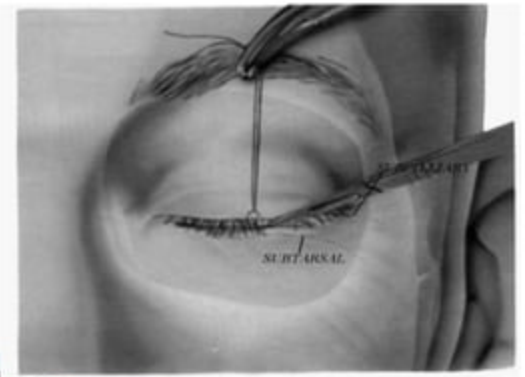
b)Subciliary incision : The incision is made approximately 2 mm inferior to the eyelashes, along the entire length of the lid. The incision may be extended laterally approximately 1 to 1.5 cm in a natural crease if more exposure is necessary

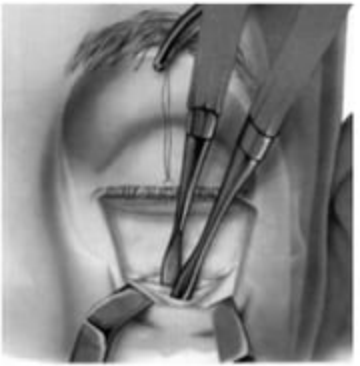
- **Indications:** For exposure of the infraorbital rim for fixation of fracture passing through the infraorbital rim.



c)Subtarsal incision : This incision is placed between the subciliary and infraorbital incision. It is placed in the lower palpebra along the tarsal plate.

- Indications: Exposure of the infraorbital rim and the orbital floor

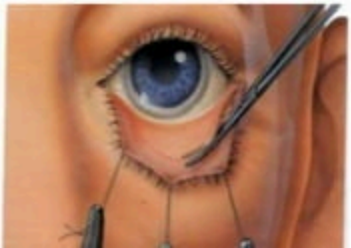


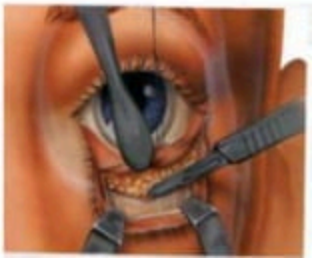


d)Transconjunctival incision : The lower eyelid is everted with fine forceps and two or three traction sutures are placed through the eyelid approximately 4-5 mm below the lid margin to include the tarsal plate in the suture.

- Incision is placed on the lower palpebral conjunctiva mid way between the inferior margin of the tarsal plate and inferior conjunctival fornix.

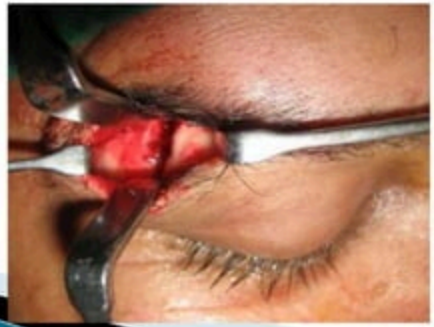
Indications: For exposure of the infraorbital rim for fixation of fracture passing through the infraorbital rim.

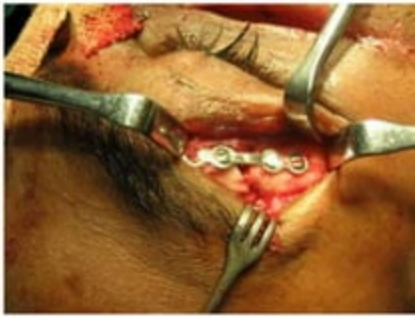




e)Lateral brow incision: The eyebrow is not shaved. The skin is stretched over the orbital rim using two fingers and a 2 cm incision is made. The incision should be parallel to the hair follicles of the eyebrow

- **Indications:**
- Exposure of the Frontozygomatic suture and lateral part of the supraorbital rim.
- Exposure of the lateral orbital rim





f) Crow's feet incisions: It is an extension of the lateral brow incision given if more inferior exposure is required. The incision is extended laterally into a crow's foot wrinkle at least 6 mm above the level of the lateral canthus.

g) Upper lid blepharoplasty incision : The incision is placed in a skin wrinkle in the superior eyelid at least 10 mm superior to the upper lid margin and 6 mm above the lateral canthus as it extends laterally.

REFERENCES

- Neelima Malik
- Chapter 3, Incisions in maxillofacial surgery, Borle

THANKYOU