Expedition Facial Trauma Workshop

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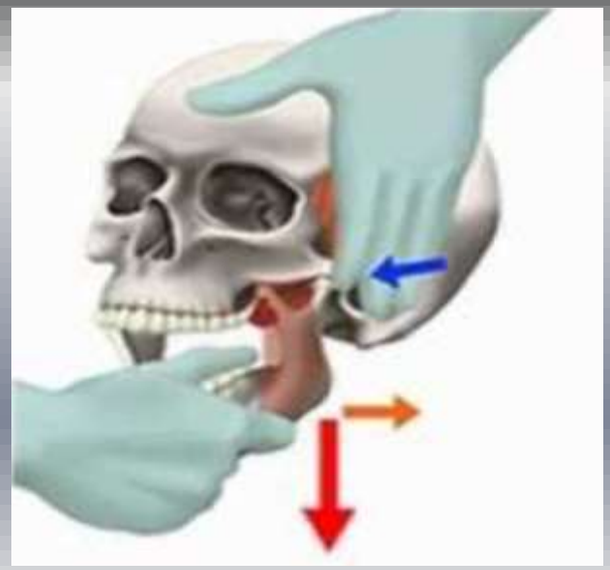

1)Mandibular Fracture Module- Assessment. Primary Management. Hands On Practice in Stabilisation- Barrel Bandage; Bridal Wire Placement ; Ivy Loop Wiring; Jaw Wiring

2)Maxillary Fracture- Assessment. Primary Management. Hands On Practice in – Posterior And Anterior Nasal Packing

3)Jaw Joint Dislocation- Assessment .Hands On Practice in - Reduction and Stabilisation

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Expedition Dentistry Lecturer
Adventure Medic Resident Dentist

Facial Trauma + Jaw Fracture - This **MODULE** will train you in how you can a) Diagnose b) Temporary Stabilise a Mandibular Fracture. i) Stabilise- Technique of tying a Barrel Bandage. ii) Simple “bridle” wire technique iii) Ivy Loop-Interdental (MaxilloMandibular) Fixation.

Hands on

Burjor Langdana

Expedition In Kyrgyzstan – A bad fall results in FACIAL INJURY – WHAT DO YOU DO ?

1) Rock Climbing Accident –
pik kinmundy-pointe Andrea

2) A long way from Base camp.
Longer way from Medical Help.

1) Primary Quick Assessment
2) Contact Base Camp
3) Prevent Shock
4) Primary Stabilisation
5) Possibility of Transport to base camp

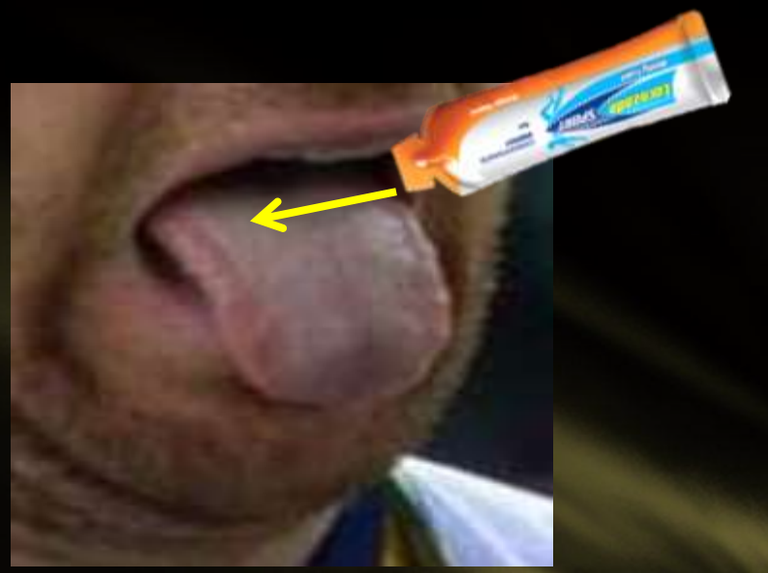
3) Calling Base Camp

4) Must Make Sure He does Not Faint!

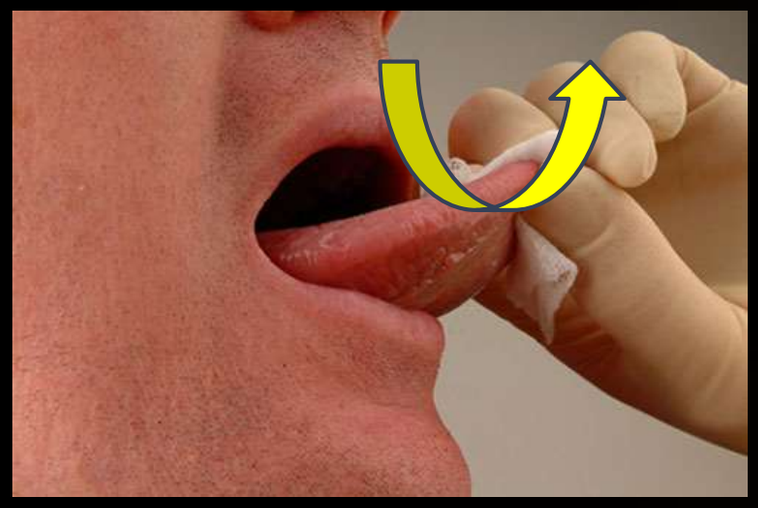
5) Has Not Eaten , Can He Swallow.
Give Him Fluids

6) Cant swallow. Try to get some GEL, or Gel like consistency – Jam. With some Help fprm you.

7) Hold tongue with any fabric . Pull downwards and forwards .

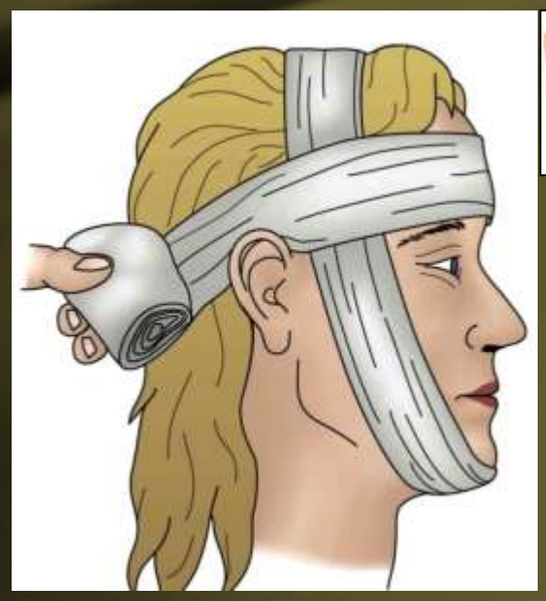


8) Squeeze Gel onto the posterior third of tongue.



9)Relax Tongue upward and backwards. Allowing gel to slide tween tongue, palate .

10) Primary Stabilisation- A simple BUFF. Exerting an upward pressure



11) Primary Stabilisation- BARREL BANDAGE- HANDS ON EXCERSISE 1

Stabilisation Using Barrel Bandage

1

1) Centre Of bandage below chin. Constant upward traction

2) Tail of bandage crossed over above left ear

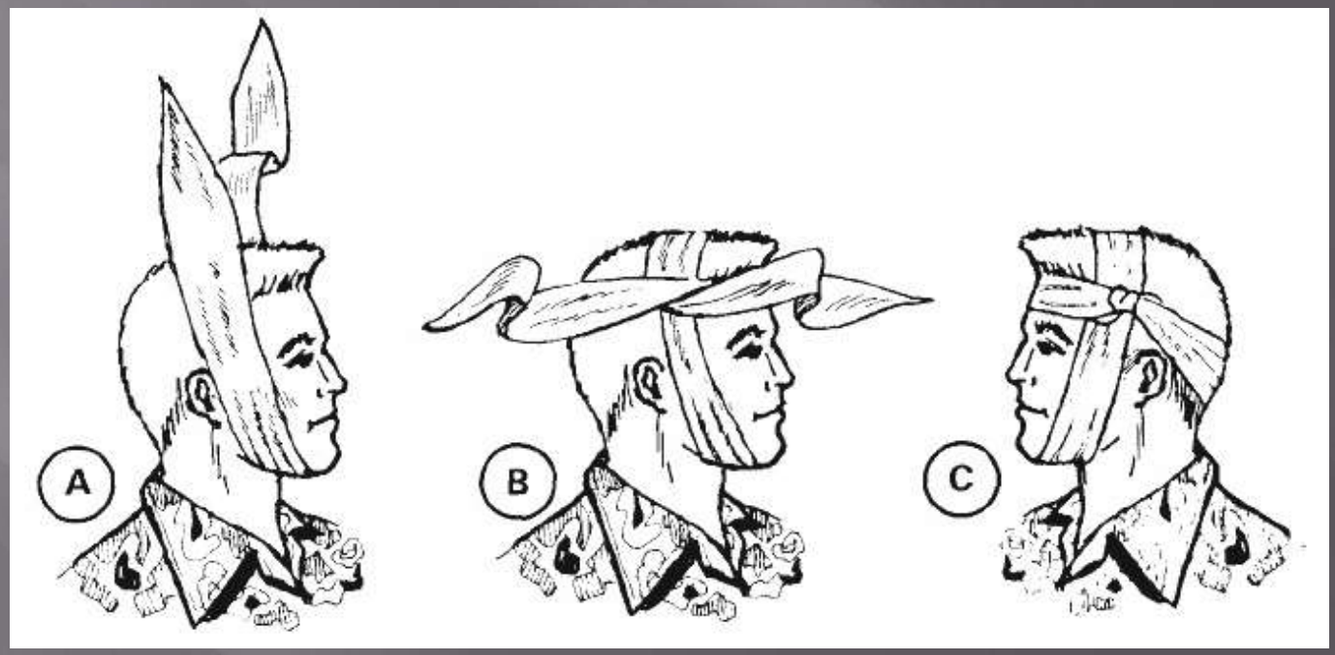
JUST ABOVE EAR

3) Tails taken around front and back of head to right ear

JUST ABOVE EAR

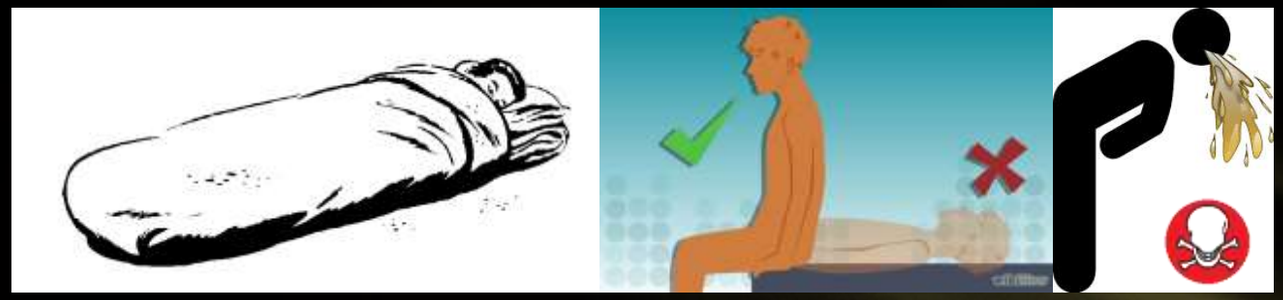
4) Tails crossed over above right ear

5) Knot placed above right ear



BASE CAMP

1) Secondary Assessment
2) Medivac
3) Stabilising Casualty in Base Camp

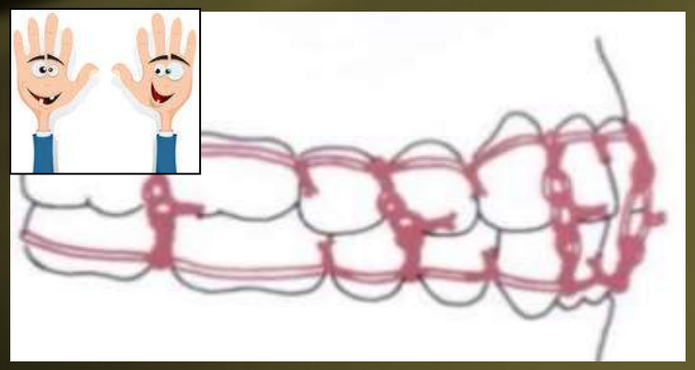


Torch taped to Spatula/Spoon helps in examination

12) Casualty - Warm. Supine. Head Propped Up. Under Constant Supervision. Swallowed Blood is a strong emetic. High possibility of nausea and vomiting

13) BRIDAL WIRE STABILISATION- HANDS ON EXCERSISE 2

14) MediVac Delayed Or Bumpy Rescue!



15) JAW WIRING STABILISATION - HANDS ON EXCERSISE 3

Clinical features - Physical Examination
" Look with fingers and eyes".

- Extensive edema
- Tenderness.
- Step deformity
- Bone crepitus
- Facial asymmetry

- History
- Mechanism of injury
- Extraoral / Intraoral

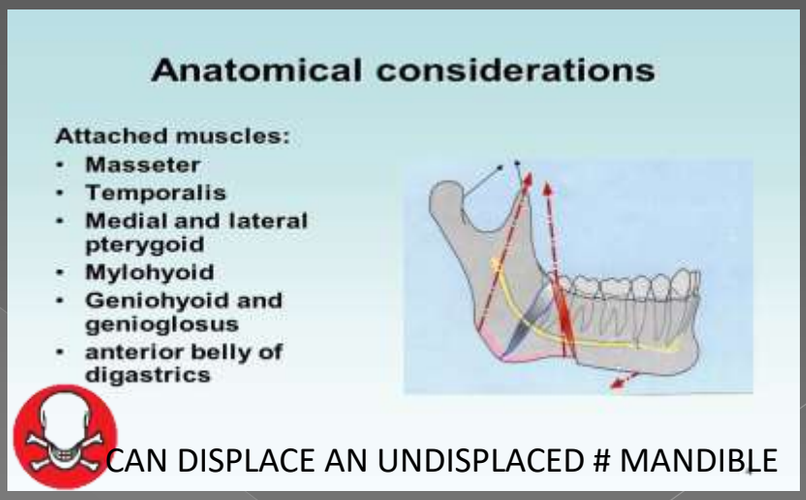
Facial Oedema ⇧

Deviation of jaw

Restriction of mouth opening

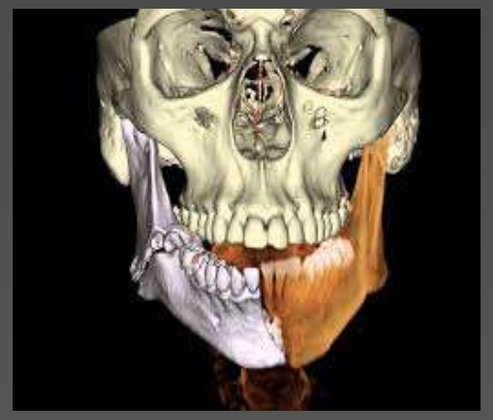
Bone crepitus

Step deformity

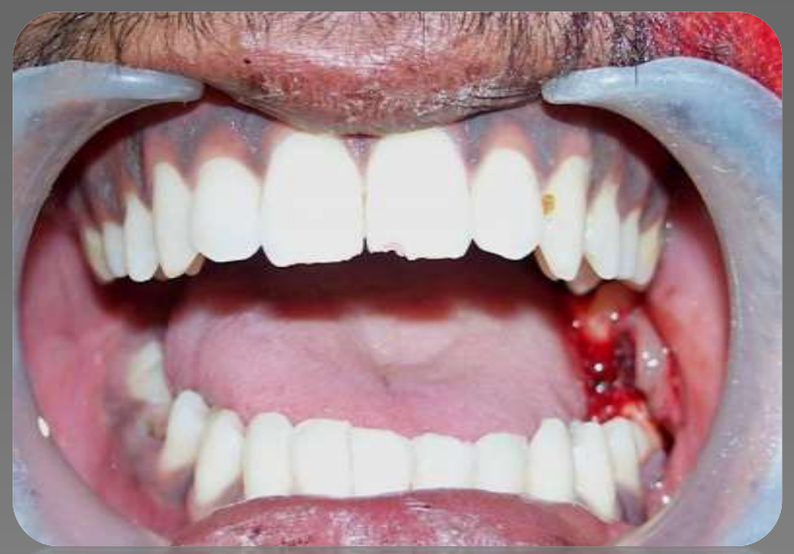


Tongue blade test for fracture mandible- Patient asked to hold tongue depressor between teeth. He then tries to bend and break the tongue blade that is clenched between his teeth. Inability too extreme discomfort ; Points in direction of # mandible.

Collapsed arch and Interfragmentary mobility

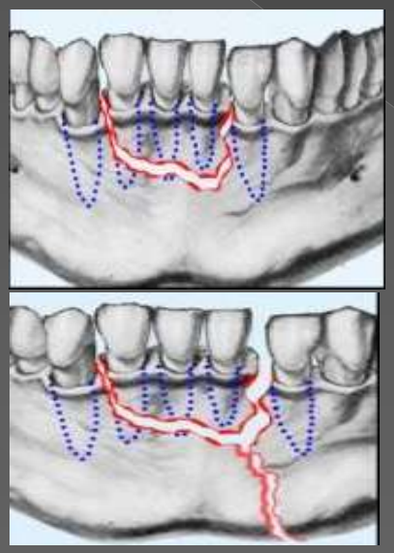


Open bite due bilateral poster Gagging of occlusion



Open bite and cross bite due to Unilateral gagging of occlusion

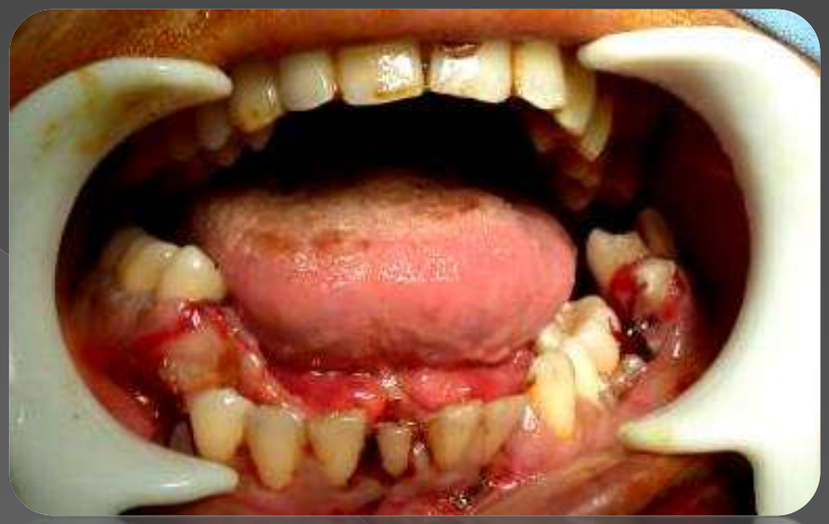
Occlusal step with Unilateral cross bite



Mandibular fracture has to be differentiated from extensive Soft tissue injury and dentoalveolar trauma

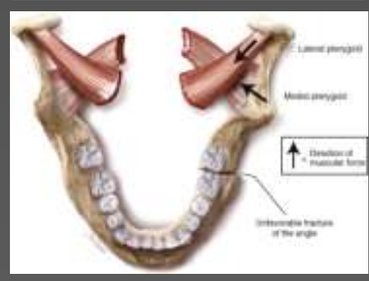
UNILATERAL CROSS BITE

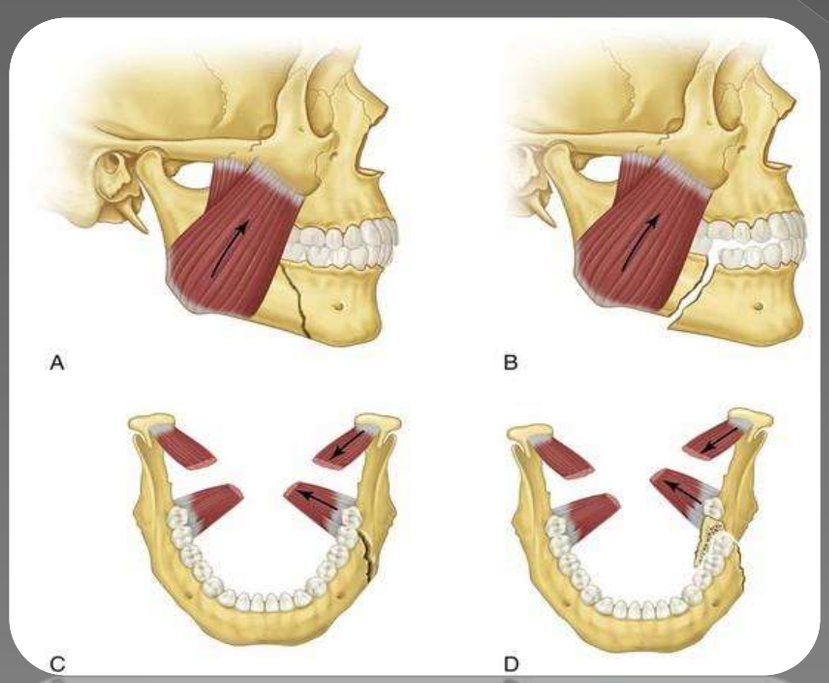
UNILATERAL OPEN BITE



Multiple fragmentation with complete loss of occlusion

Unfavorable fracture line causing displacement





Vertically and Horizontally favourable and unfavourable fracture lines.

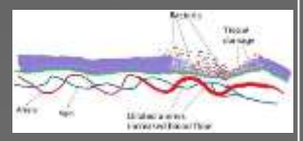
Sublingual hematoma

Why Should You Temporarily Stabilise A Jaw Fracture ?

- Increase patient comfort

- Reduce bleeding

- Minimize further tissue damage



- Protect airway

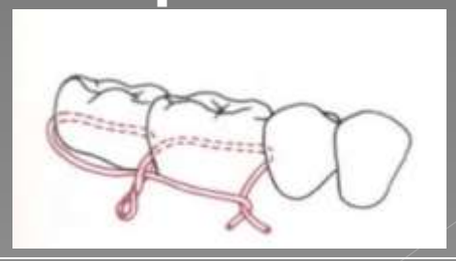
- Stabilise patient for Transport

What Methods Could You Use For The Temporary Stabilisation Of A Jaw Fracture ?

- Barrel Bandage

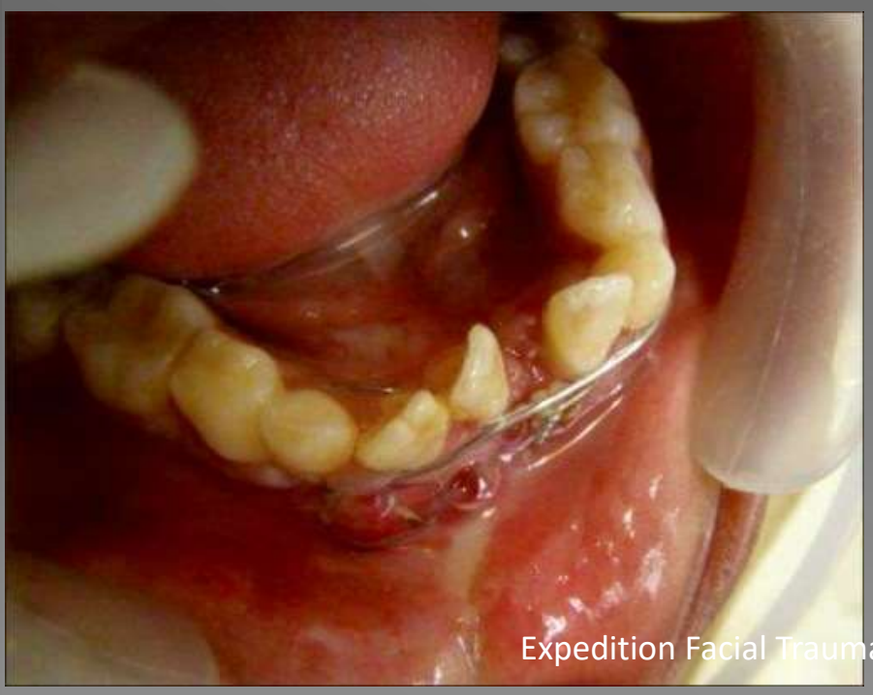
- Simple “bridle”wire

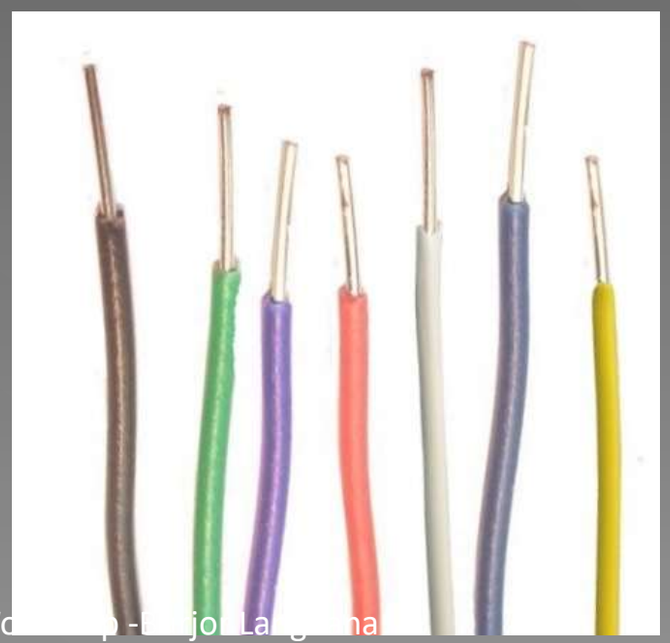
- Ivy Loops



Simple “Bridle” Wire – Temporary reduction and stabilisation.

25 or 26 gauge wire and local anaesthesia. Wrap around two teeth on either side of fracture. In absence of Stainless steel wire one can use electrical wire or cable ties.

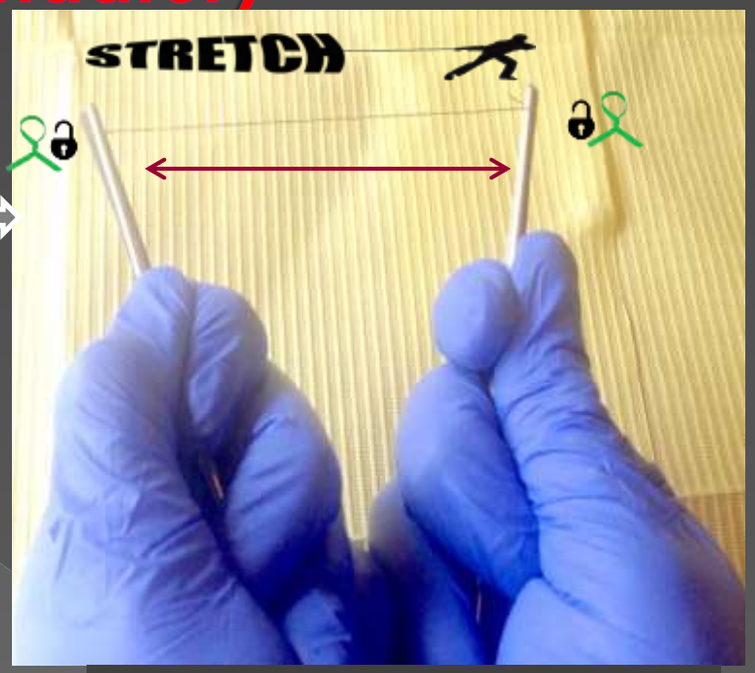




2

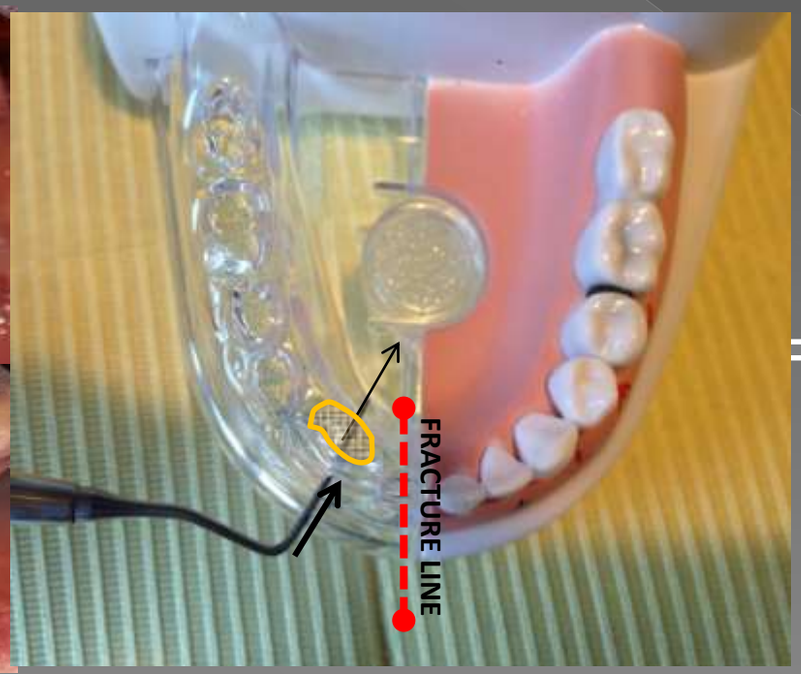
Hands On Exercise– Tying A Bridal Wire- Safety Glasses Mandatory

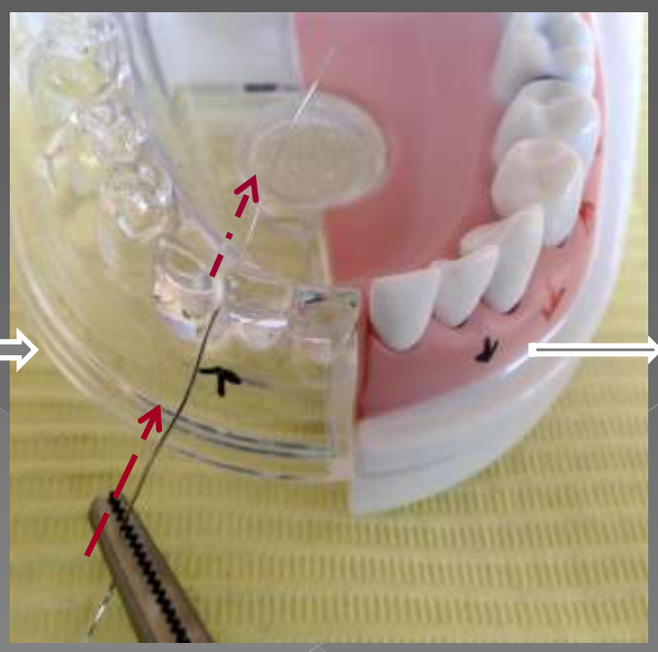
1)Take 15 cm wire (Approx- Tip Of Forefinger to Wrist). Cut THEN LOCK SPOOL.



2)Stretch & Straighten Wire Between 2 Haemostats. Twist And lock around haemostat.

3) Cut off the bendy bits (That were wrapped around the haemostats) at the edges.



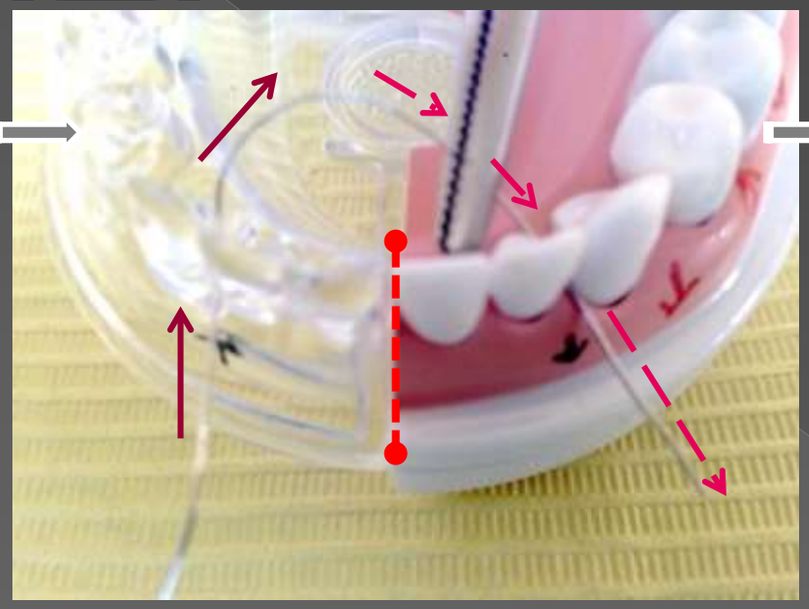


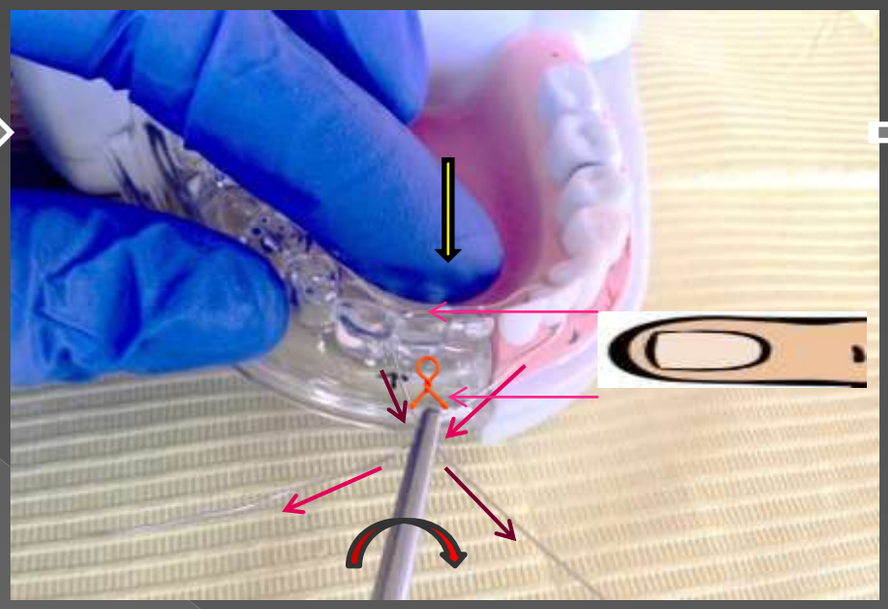
4) Collection of hard debris from poor oral hygiene between teeth. Makes it hard to push wire through. Use any pointy implement to clear debris and open interdental area. Take your probe and gently push it between teeth. Clearing and opening interdental region

5) Push the wire in From Buccal to Lingual (Following the arrows) Atleast 2 teeth away from #.

2

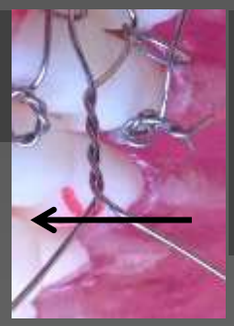
Hands On Exercise– Tying A Bridal Wire- Safety Glasses Mandatory



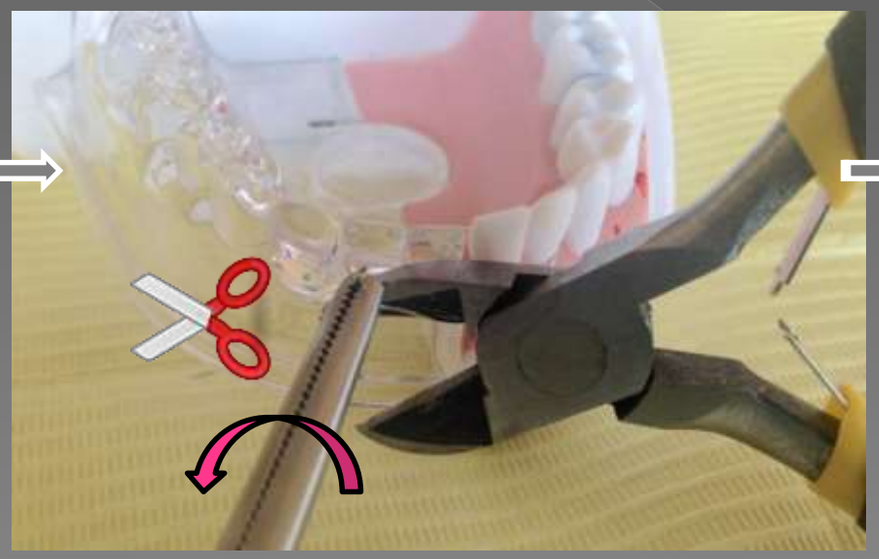


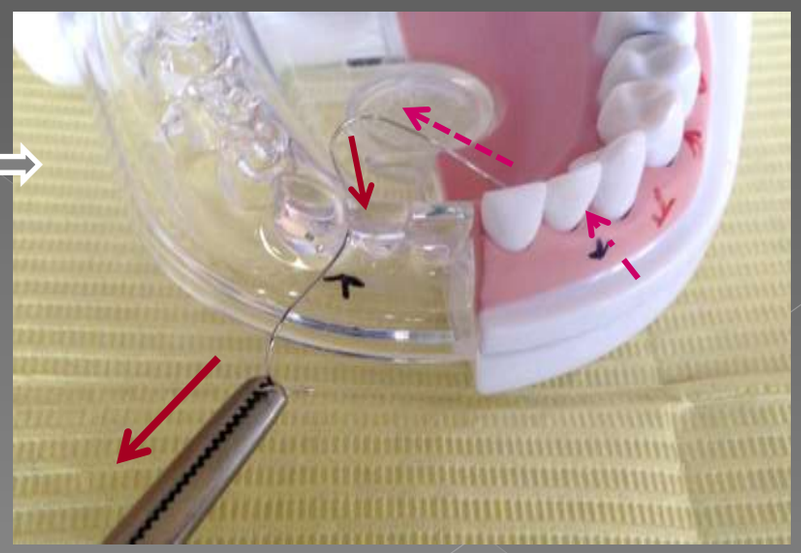
6) Catch wire Lingually and Push Buccally (follow arrows)

7)Loosely Tighten- CLOCKWISE Finger pressure lingually.



8) Cut Excess- Haemostats Clipped Before Cutting. To Prevent Loose Ends Flying around





9) Final Tightening

10) Remove Bridal Wire- Cut One end Of Knot, After Loosening ANTICLOCKWISE

11) Then Pull out Gently Towards The Cheek

IVY EYELET WIRING

- The Ivy loop embraces the two adjacent teeth. One or two Ivy eyelets should be placed in each quadrant.

- A 26 gauge stainless steel wires cut in 20 cm lengths are used.

- A loop is formed in center of wire around the tent peg, nail or shank of screw driver and twisted thrice with two tail ends.

- The two tail ends of the eyelet are passed through the interdental space of the selected two teeth from buccal(Cheek) to lingual (Tongue)side.

- One end of the wire is passed around the distal (back)tooth lingually (Tongue side)and brought out from the distal (back)interdental space over the buccal (cheek)side and threaded through the previously formed loop.

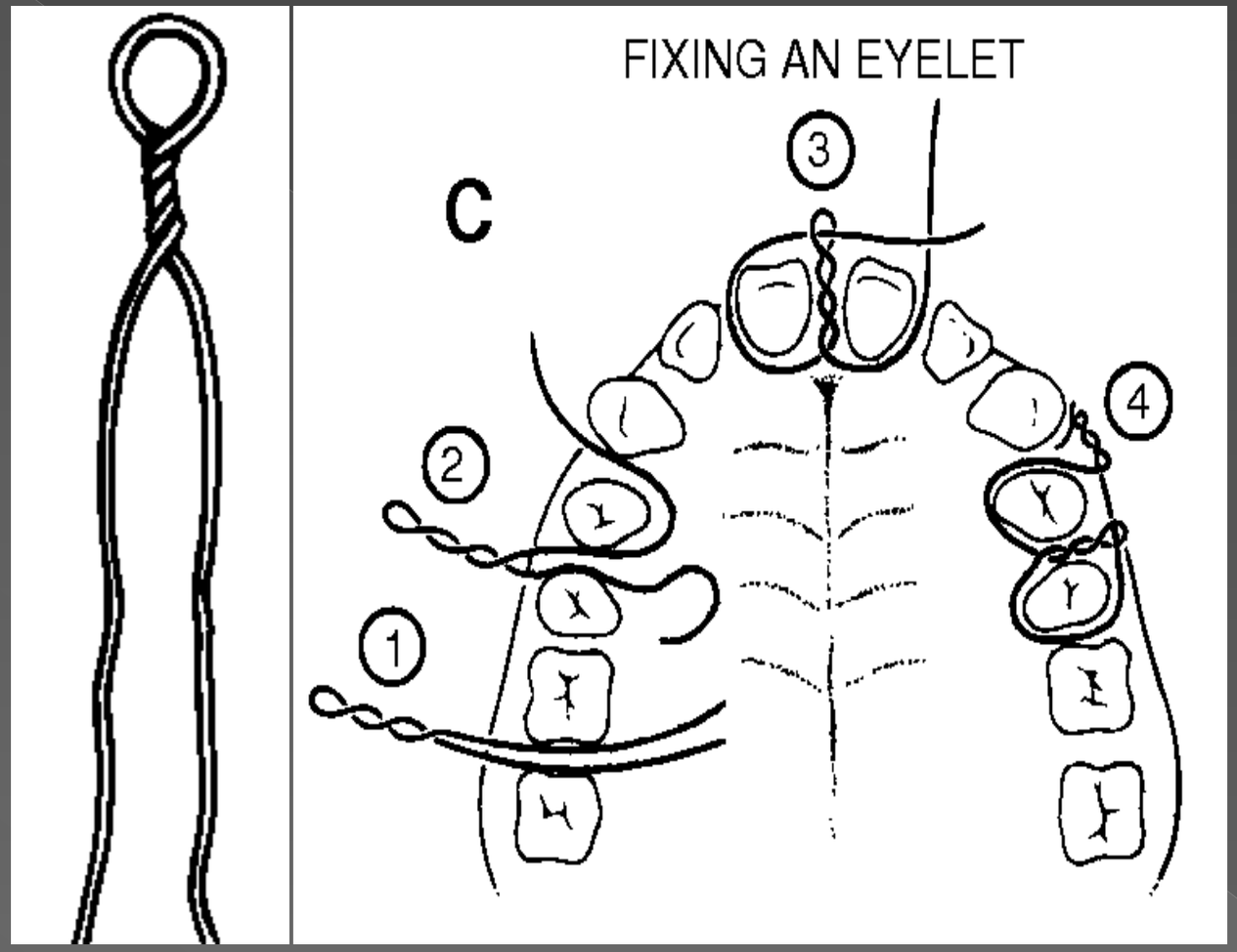
- The other wire tail end is carried around the lingual surface of the mesial tooth and brought out on the buccal surface from the mesial interdental space, where it meets the first tail end wire.

- The two wires are crossed and twisted together and the loop is adjusted and bend towards gingiva.

- The mandibular wire eyelets can be secured to maxillary eyelets by joining wires.

- Advantage is that bridging wires can be removed whenever required without disturbing the main wiring.

- Even when there is breakage of wire during fixation only that eyelet can be removed and replaced.


FIXING AN EYELET
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1
2
3
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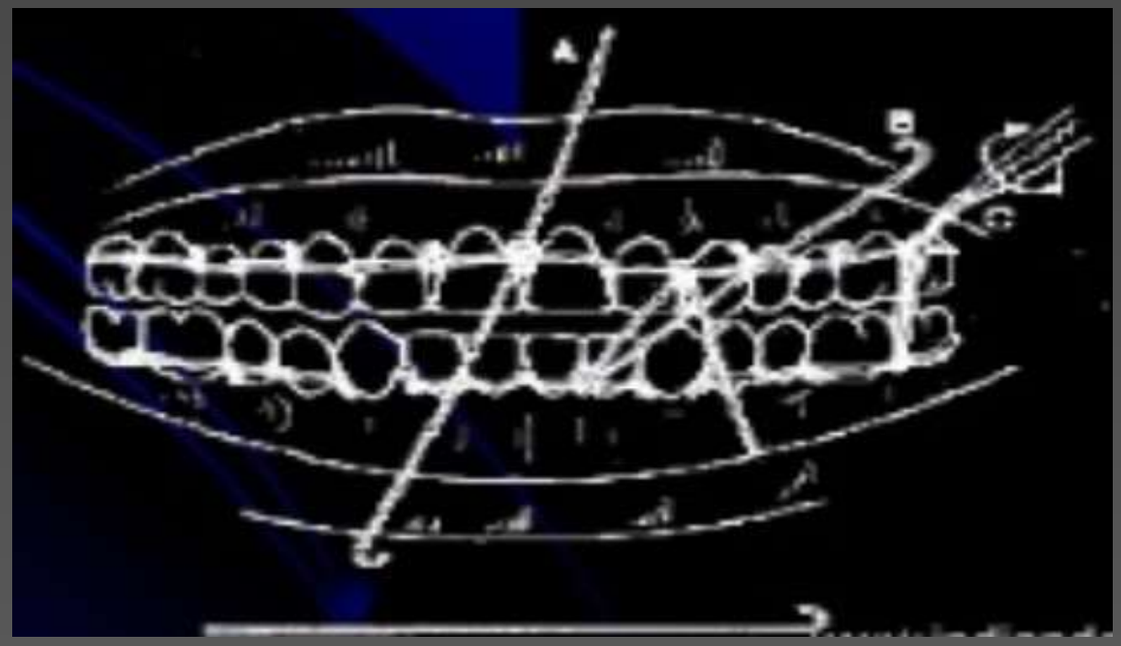
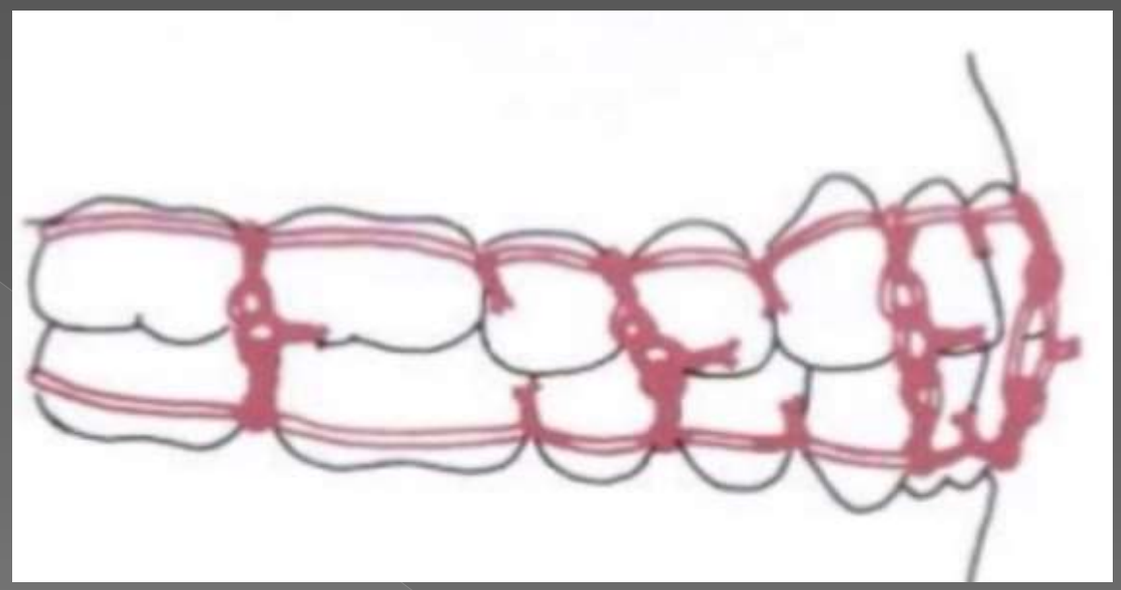
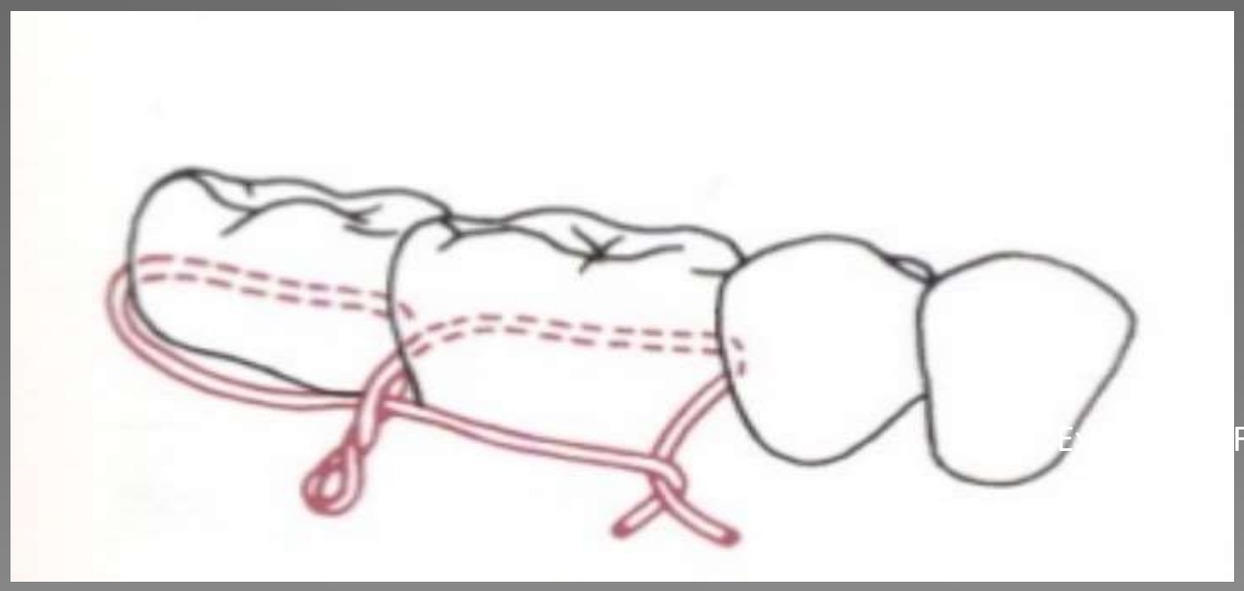


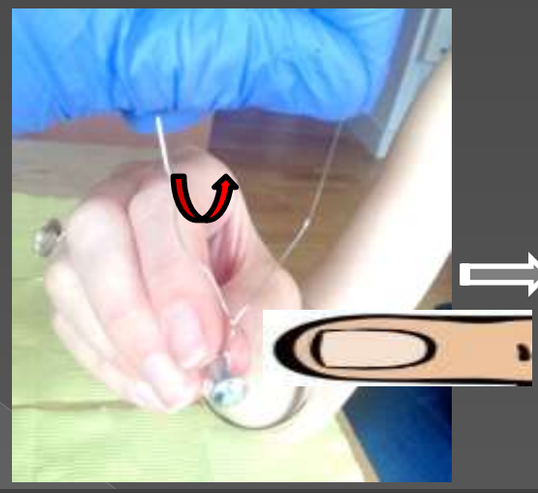




3

Hands On Exercise– Making An IVY loop- Safety Glasses Mandatory

1)Unlock 15cm Wire. Cut. Stretch. Cut ends. Remember to lock spool

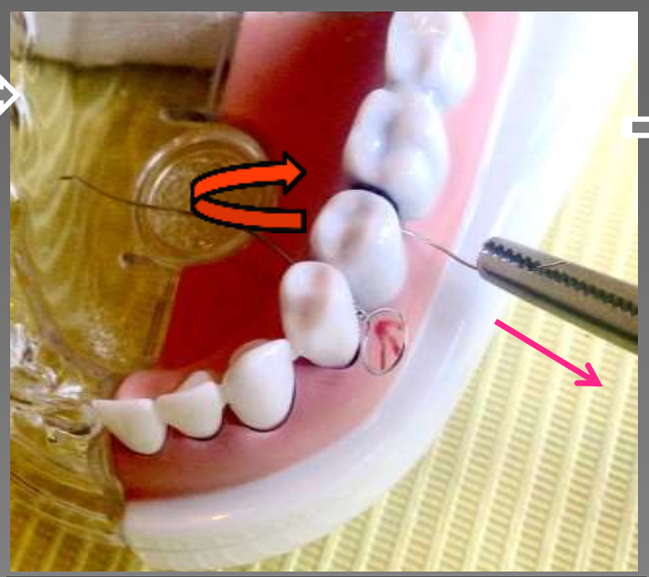


2)Put nail , wire midpoint. Twist CLOCKWISE.Approx 3 Twists

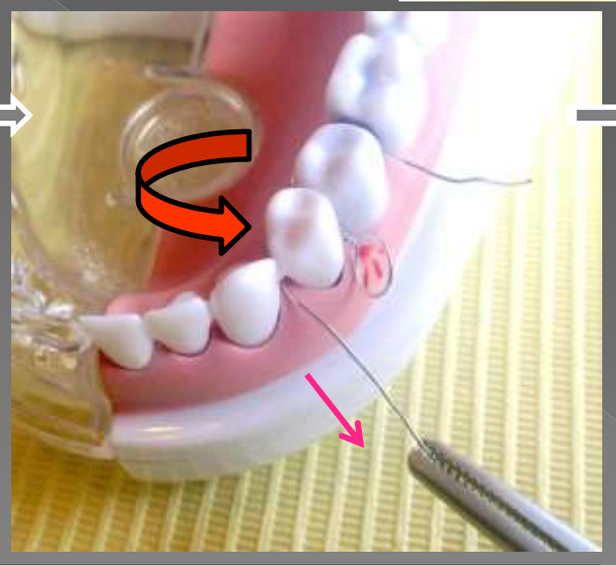
3)Tighten the loops with haemostat. CLOCKWISE

4)An IVY Loop is born.

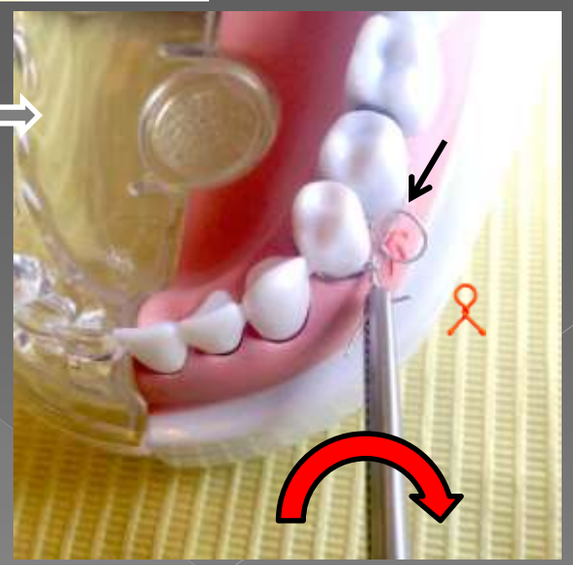
5)Push the tails of the IVY Loop between teeth. From Cheek to Tongue. Follow the Arrows



6)Push back tail between teeth from Tongue to Cheek. Follow Arrow

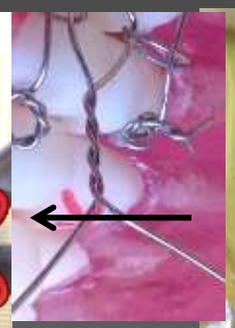


7)Push front tail between teeth from Tongue to Cheek. Follow Arrow



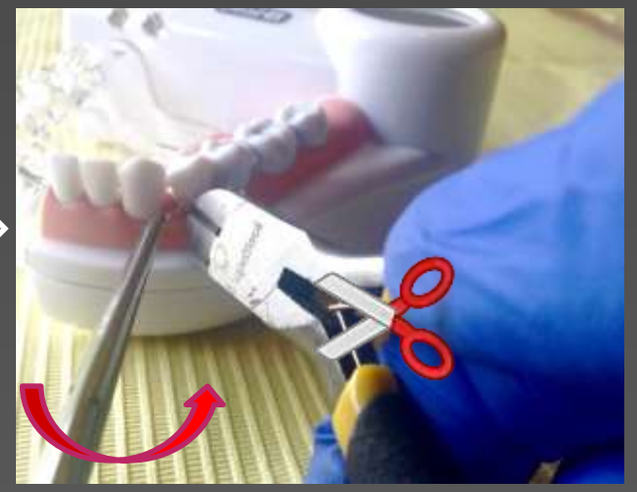
8)Pull back tail THROUGH IVY loop and tie CLOCKWISE With front tail using haemostat

Hands On Exercise– Making An IVY loop- Contd… Safety Glasses Mandatory



9)Cut Off Excess Wire

8) Final Tightening



9) Remove IVY Loop- Cut Of Knot, After Loosening ANTICLOCKWISE.

10)Full Knot held by haemostat then cut off.

11) Then Pull out Gently Towards The Cheek.

HOLDING AND HANDLING MR. SLIPPERY, FRAGILE SKULL.

Bridging wire And All Further Hands-ON Excersise Will Be Practiced On Plastic Skulls. To Make It More Real.
Sit In Pairs Facing Each Other With Mr Slippery Fragile Skull Between. HE IS VERY SLIPPERY. One Holds The Skull As The Other Practices.

Hold Mr Skull From the Back firmly. Thumbs at the top.

Fingers Grasped around Occipital Prominence and into the Foramen Magunm.

Make sure your hands rest on the table or they will get tired.

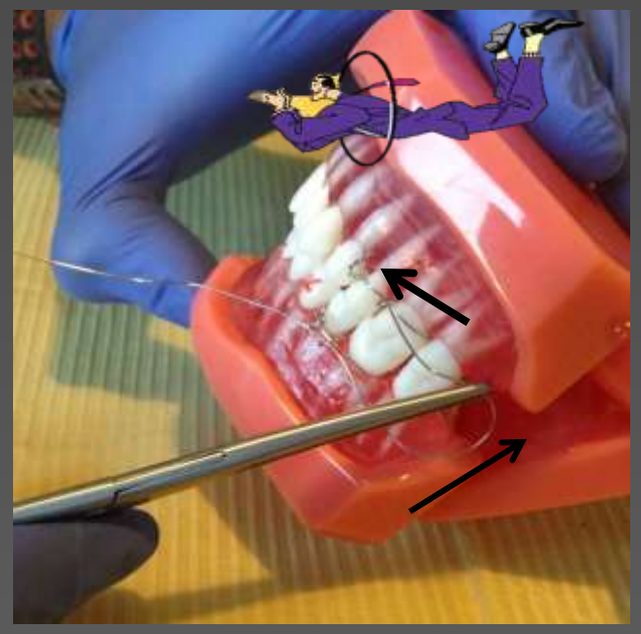
4

Hands On Exercise– Bridging Wire Joining Upper and Lower IVY loops- Safety Glasses Mandatory

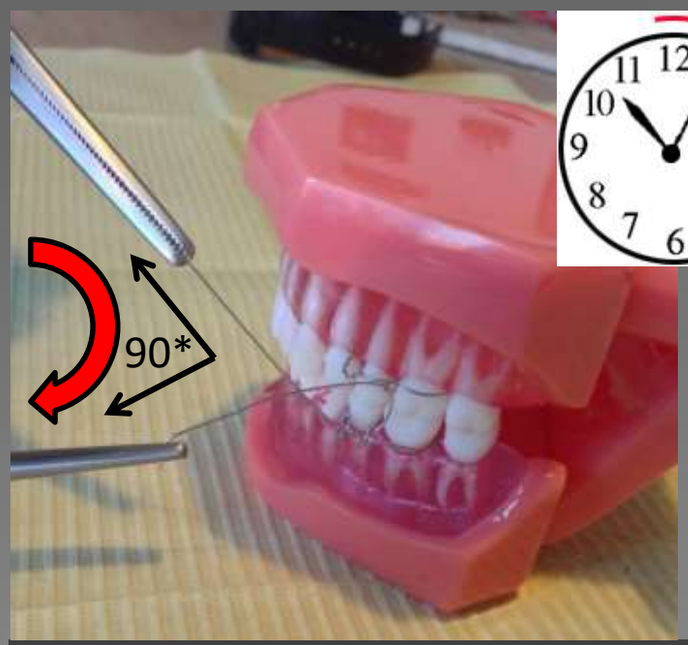
THEN LOCK SPOOL

1)Unlock 15cm Wire. Cut. Stretch. Cut ends. Remember to lock spool

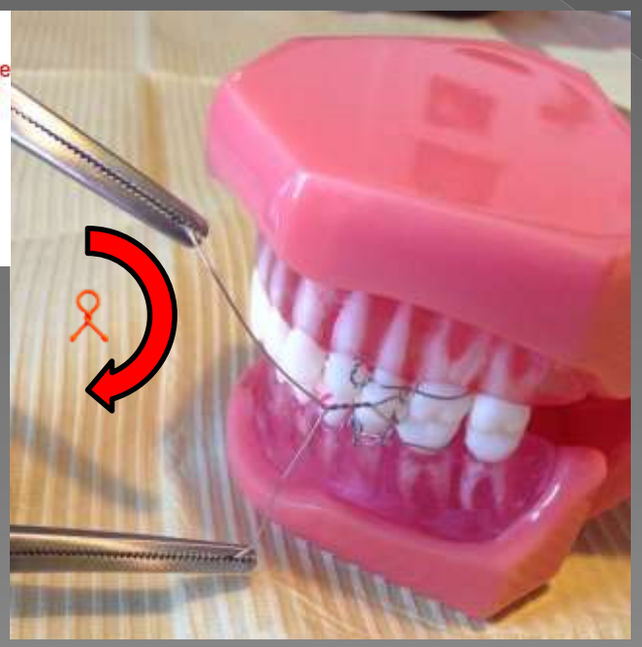
2) Push wire through mandibular loop



3) Pull wire out from mandibular loop and push it through Maxillary loop.



4) Ends of wire held with clips. Crossing At and angle of 90 degrees (approx)

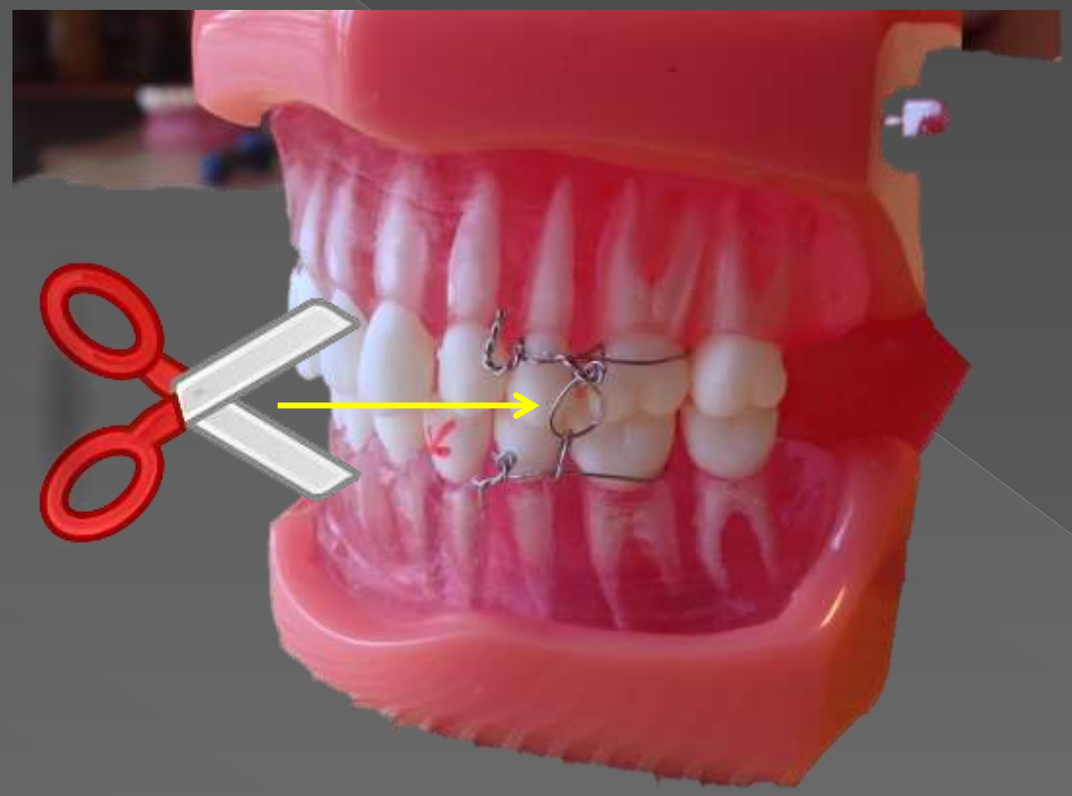


5) Tighten by twisting clockwise

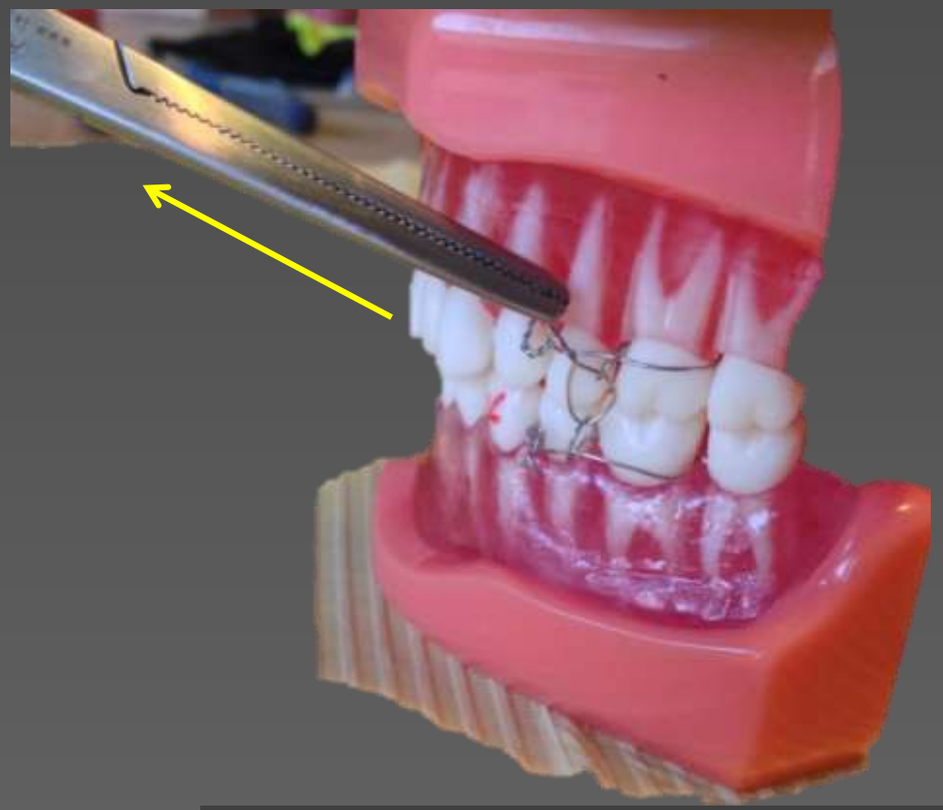
6) Cut and do final tightening

4

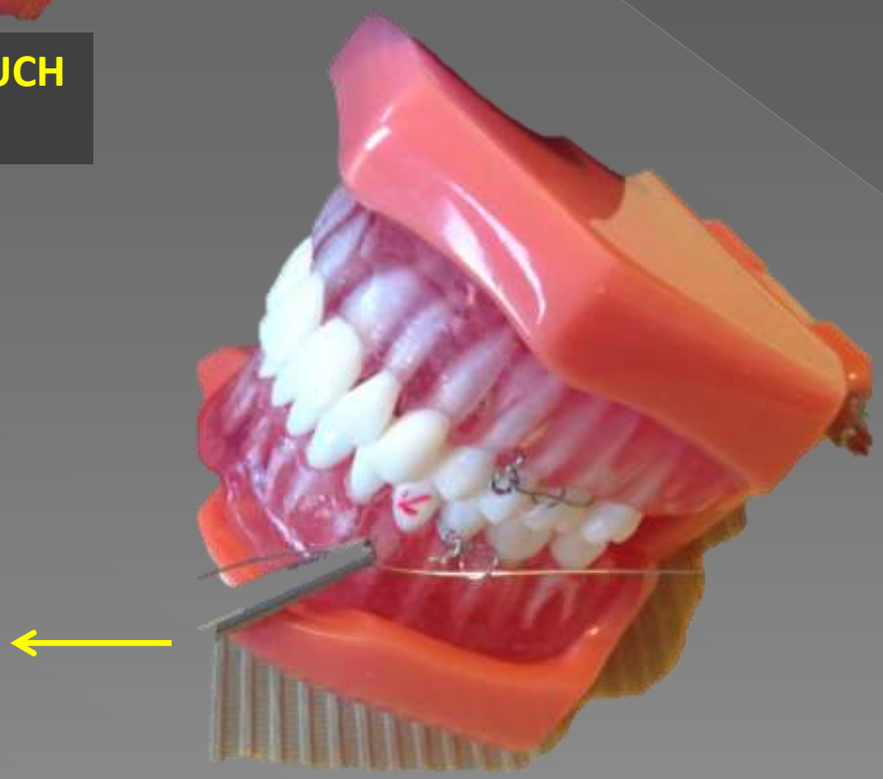
Hands On Exercise– CUTTING The Bridging Wire Joining Upper and Lower IVY loops- Safety Glasses Mandatory



Cut Bridging wire ONLY. DO NOT TOUCH IVY LOOPS.



Clamp the knotted end of CUT Bridging wire with artery clip and pull it out GENTLY.



Leaving the INTACT IVY LOOSPS BEHIND.

What You Hope To Achieve

- Restoration of bite
- Reduction of fractured segments
- Stabilization of fractured segments

RESTORATION

BITE

REDUCTION

STABILIZATION

Key Points To Remember While Doing Interdental Wiring

- Pre stretch wire

- Twist wires in a clockwise direction

- Apply forces apically (rootwards) when tightening wire.

- Lightly tighten all wires then do final tightening after cutting wires short.

- Tails of protruding wires can traumatise the mucosa

Adjunctive Treatment- If Medivac not possible. How do you look after this patient?

- **In the First**  **Hours**

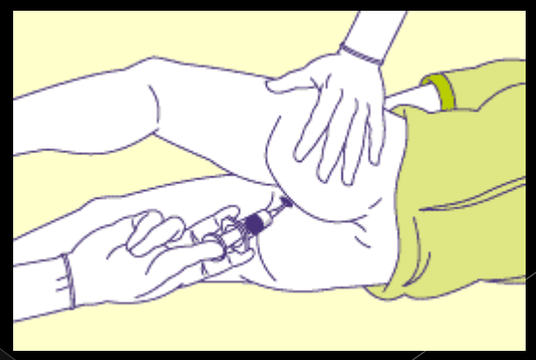
- **Position-** Head Propped up helps breathing

- **Close all lacerations -**within 12 hours of injury if possible.
- **Oral Health Care-**a) First 24 hours No Rinsing
  - b) Irrigate Mouth with  Half Teaspoon salt in  cup lukewarm water

- **Nutrition-**

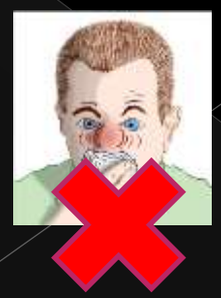
Retract Cheek with spoon

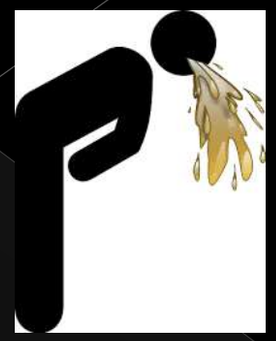
Wide Bore Syringe. Very Thin Liquids



- **Medication-** Antibiotics. Pain management. Anti-inflammatories
  - Route- Soluble, IV/IM.PR

- **Caution-**
  - Do Not Blow Nose
  - Vomiting; Head Down, Remain Calm, Rinse Afterwards
  - Settle stomach clear fluids like Coke, 7up,Emetrol





Medivac Still not possible! Longer term care of this patient, than you expected. What to do?

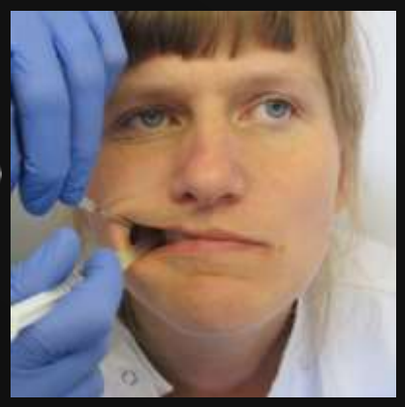
- 

Hours onwards, until Medivac is possible.

- **Position-** Encourage Mobility if Possible. In case of difficult medivac
  - a relatively mobile casualty could prove helpful.

- **Oral Health**

Retract Cheek with spoon



Irrigate and Brush after every meal

- **Nutrition-**

  - 6 to 8 Small meals a day
  - Thickening in consistency as swelling reduces
  - High Protein + High Calorie Diet
  - Double Strength Milk- Milk Powder Mixed in Milk
  - Use Milk, Juice, Warm Water as a medium
- **Caution**
  - Wire Cutter next to patient at all times.
  - Constipation/ Diarhoea-High Carb, Protein Diet

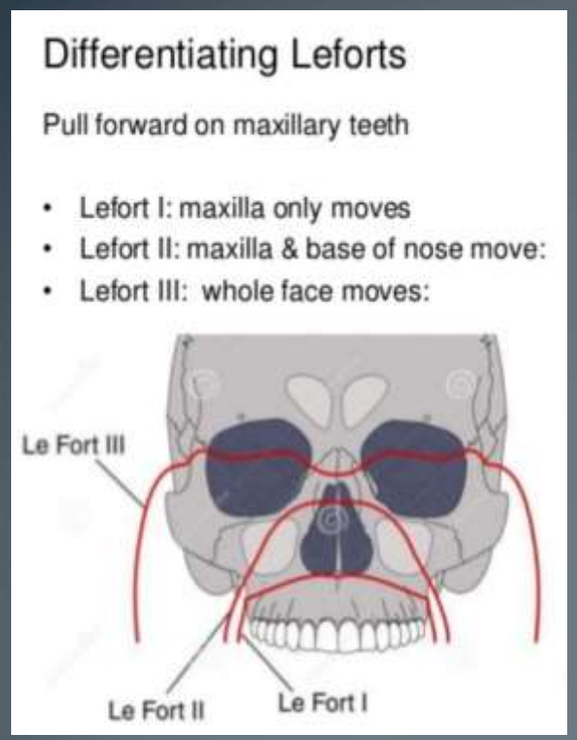
PLEASE REPLACE MATERIAL BACK ON THE WHITE TRAY IN THE SAME LOCATION

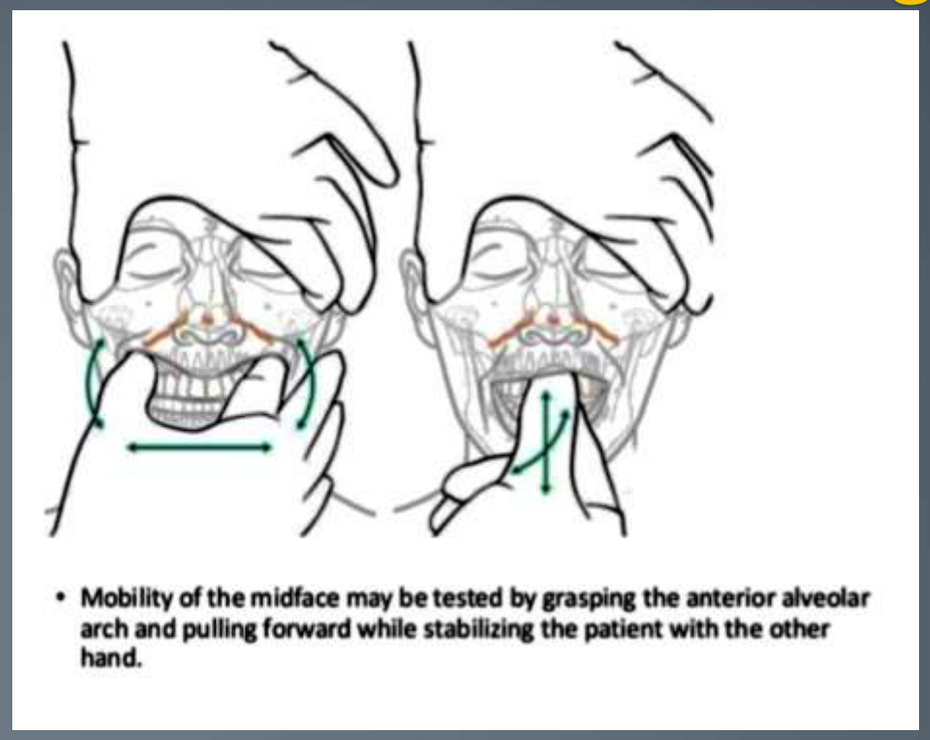
Uncontroled Nasal Bleeding +/- Facial Trauma – Anterior or Posterior **EPISTAXIS** - This **MODULE** will train you in how you can a) Diagnose Maxillary Fractures b) Control Epistaxis- i)Posterior Nasal Packing Technique ii) Anterior Nasal Packing Technique

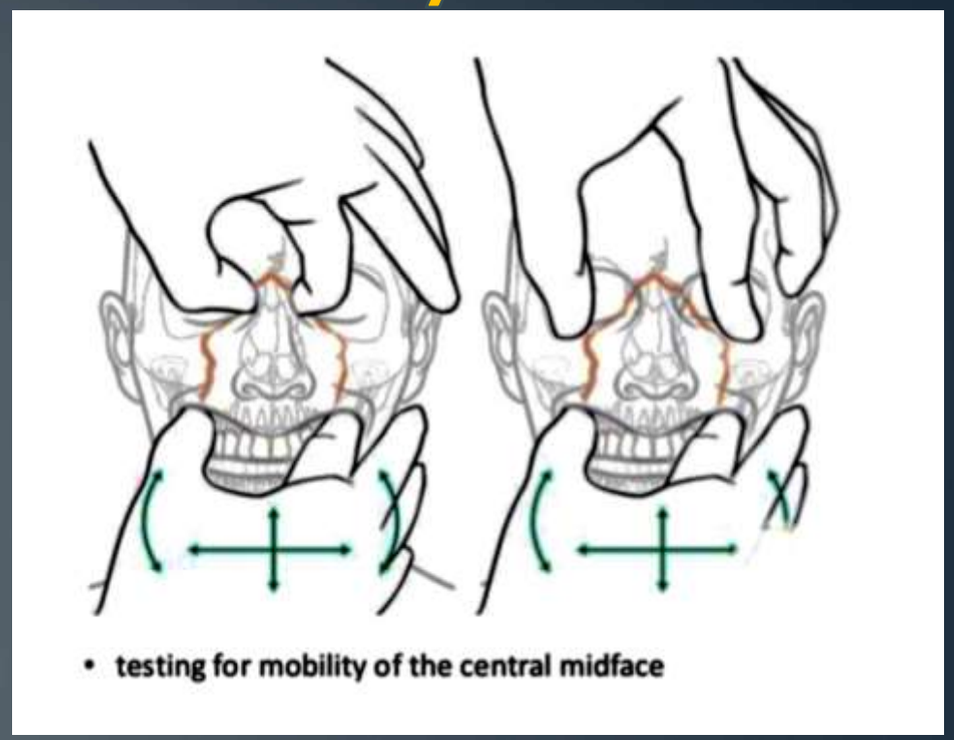
Hands on

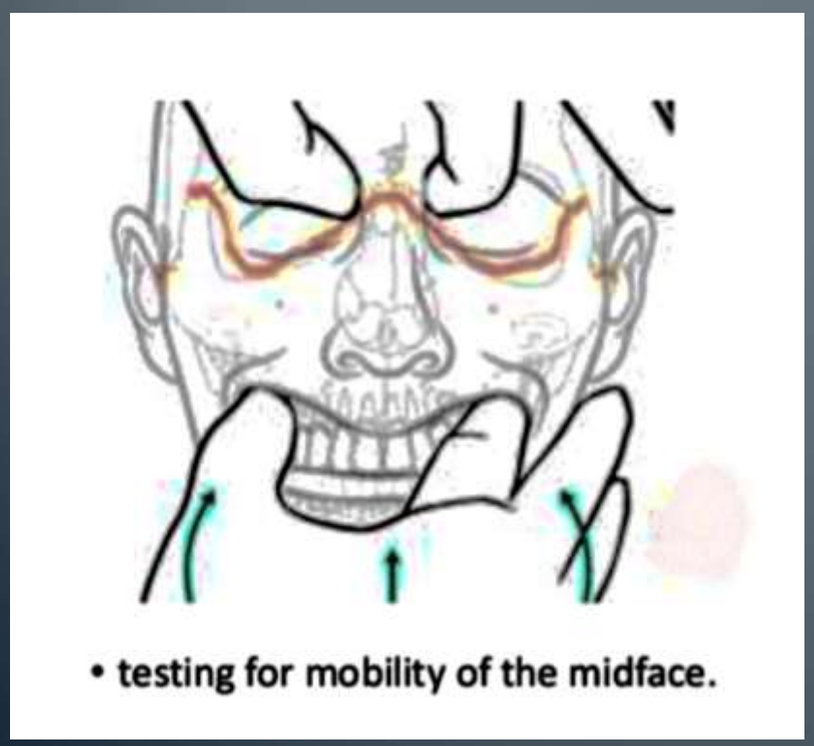
Burjor Langdana

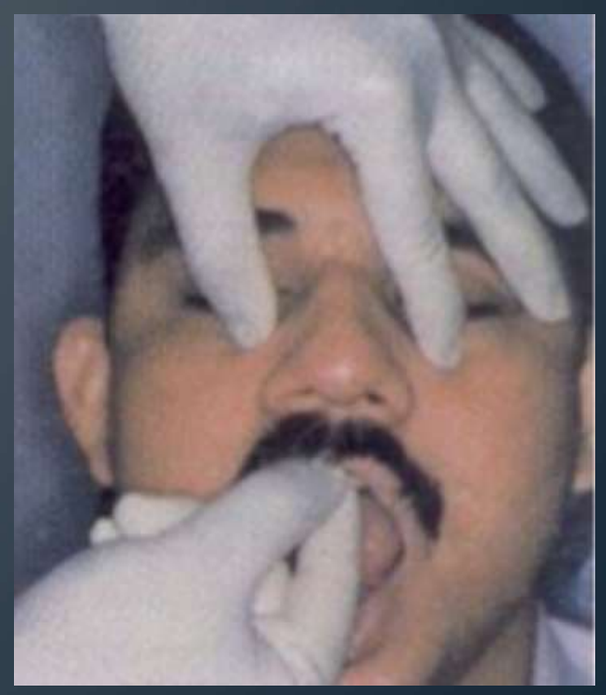
Maxillary Fractures; Clinical features - Physical Examination " Look with fingers and eyes".







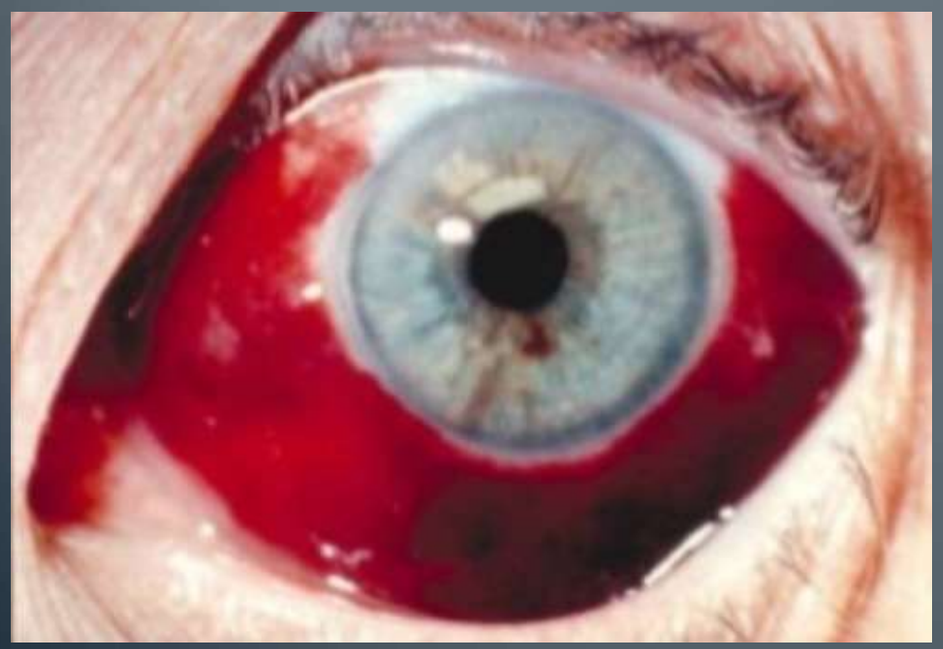




EYES AND PERIORBITAL REGION

Circumorbital Edema & Ecchymosis

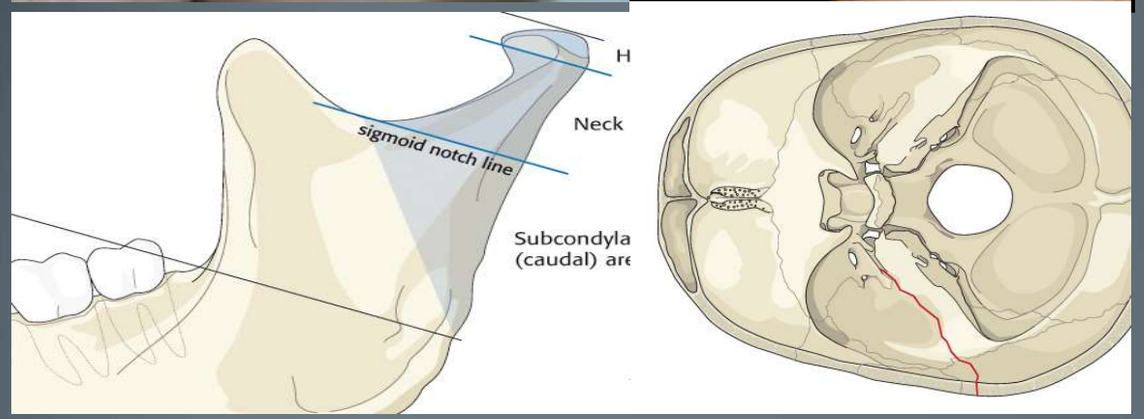
Flame shaped hemorrhage with posterior limit not seen (Suspect # of the orbital walls)



Subconjunctival Ecchymosis

Panda / Racoon Eyes.

PERI AURICULAR REGION & PALATE

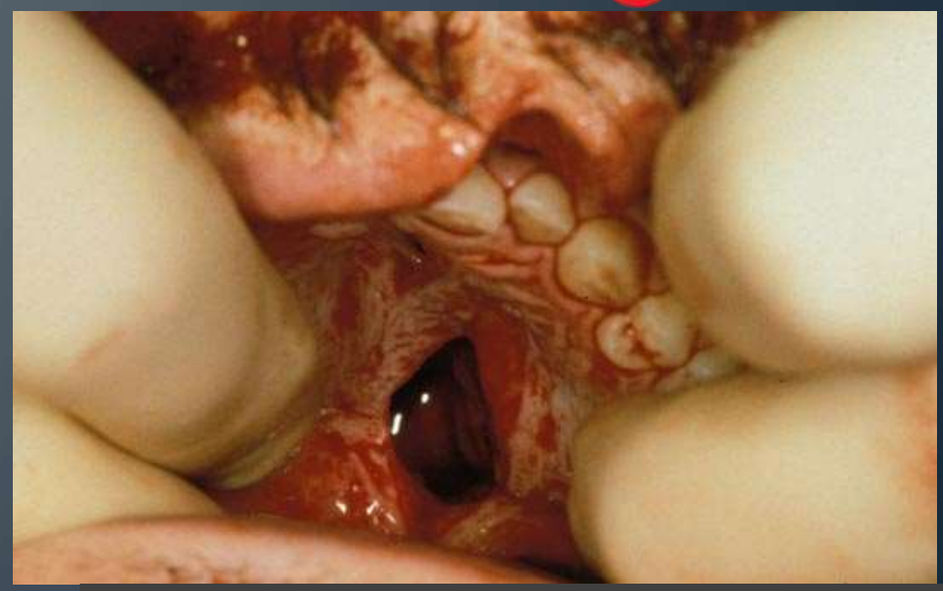


BATTLES SIGN. **Post Auricular Bruising.** **Base of Skull Fracture**

Condyle impacts above into the MCF fracturing the mastoid process .

Check for any CSF Ottorrhea

Blood in the ear canal may indicate skull base fractures or external auditory canal lesion resulting from a condylar fracture.



Palatal hematoma and/or palatal lacerations can be noted in the sagittally split palate.

- **Why you should know about management of epistaxis ?**

- Very common +/_ Facial Injury
- Causes significant concern
- Will have to be managed in the field. Anterior +/_ Posterior Epistaxis

BLOOD SUPPLY OF NOSE

Anterior ethmoidal artery
External carotid artery
Sphenopalatine artery
Internal carotid artery

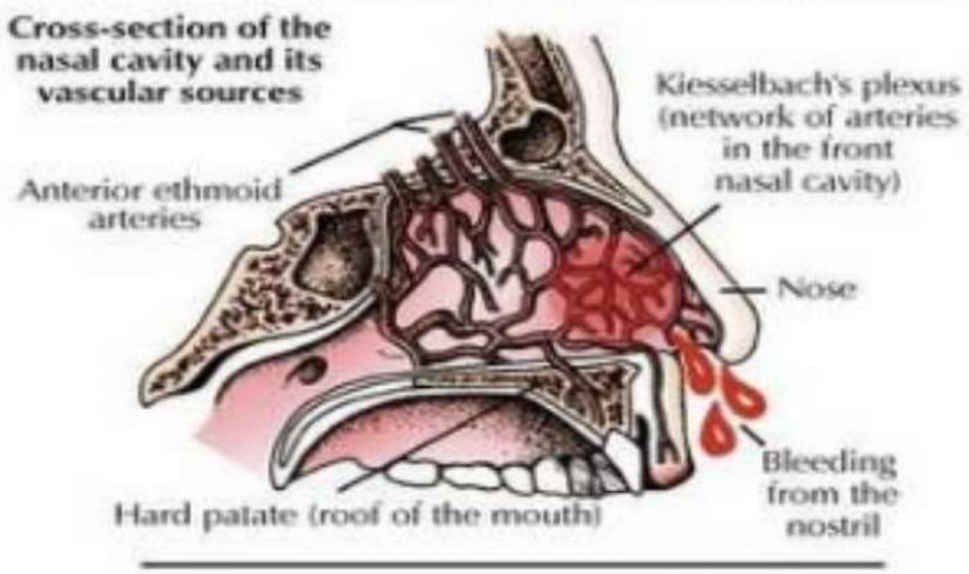
- Anterior Epistaxis

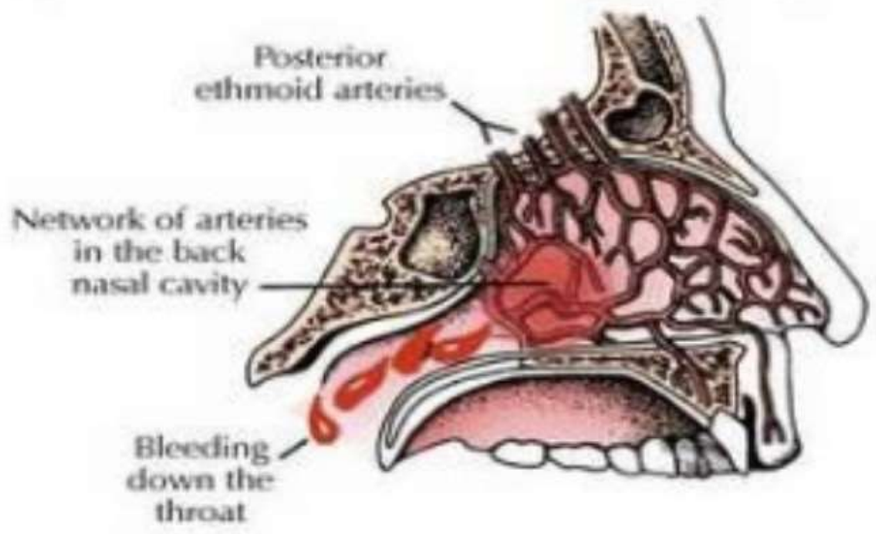
. More common

. Occurs in children and young adults

. Usually due to nasal mucosal dryness

. Alarming as bleeding seen readily but generally less severe





- Posterior Epistaxis

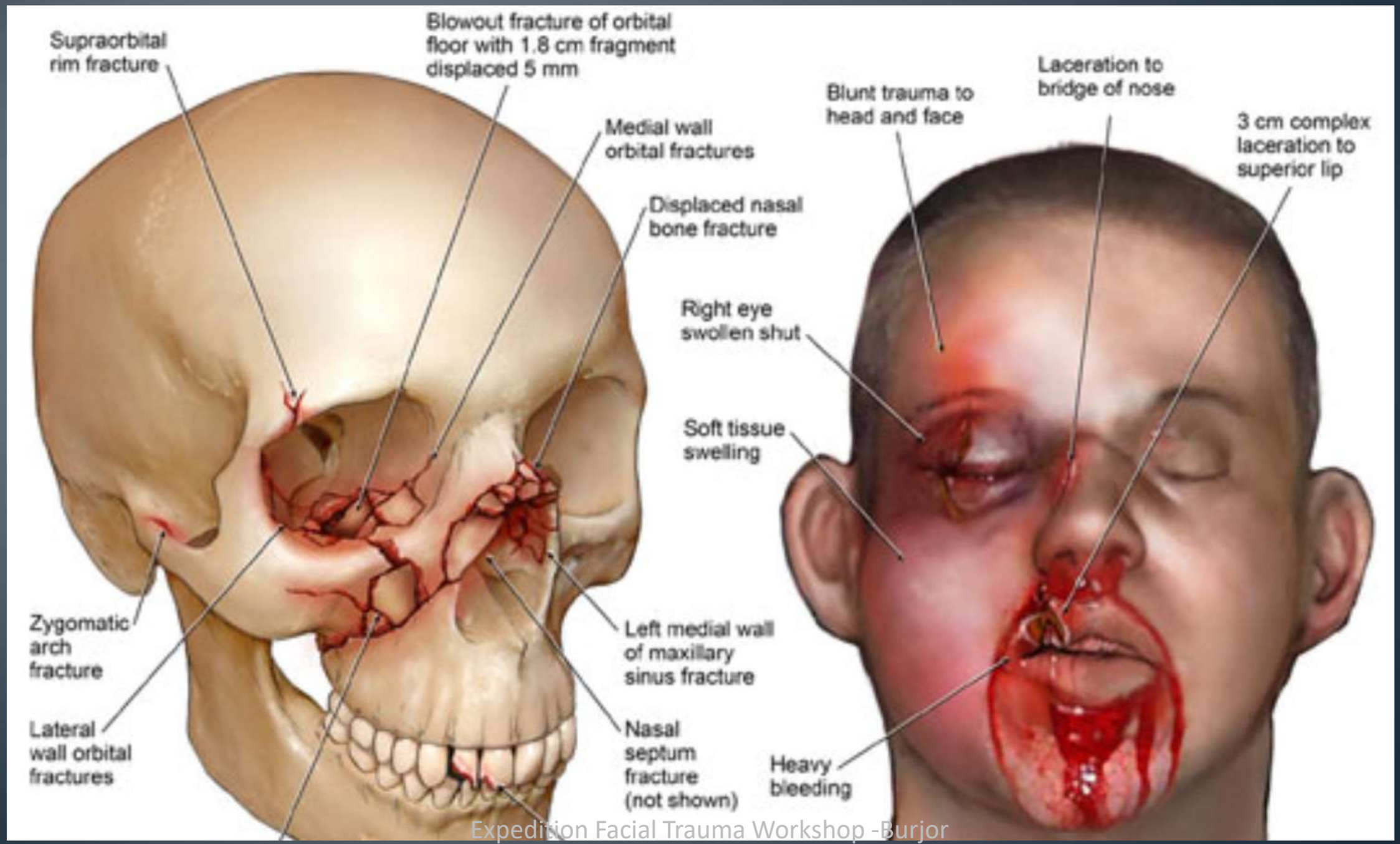
. Usually older population

. HTN and ASVD are the most common causes

. Significant bleeding in posterior pharynx

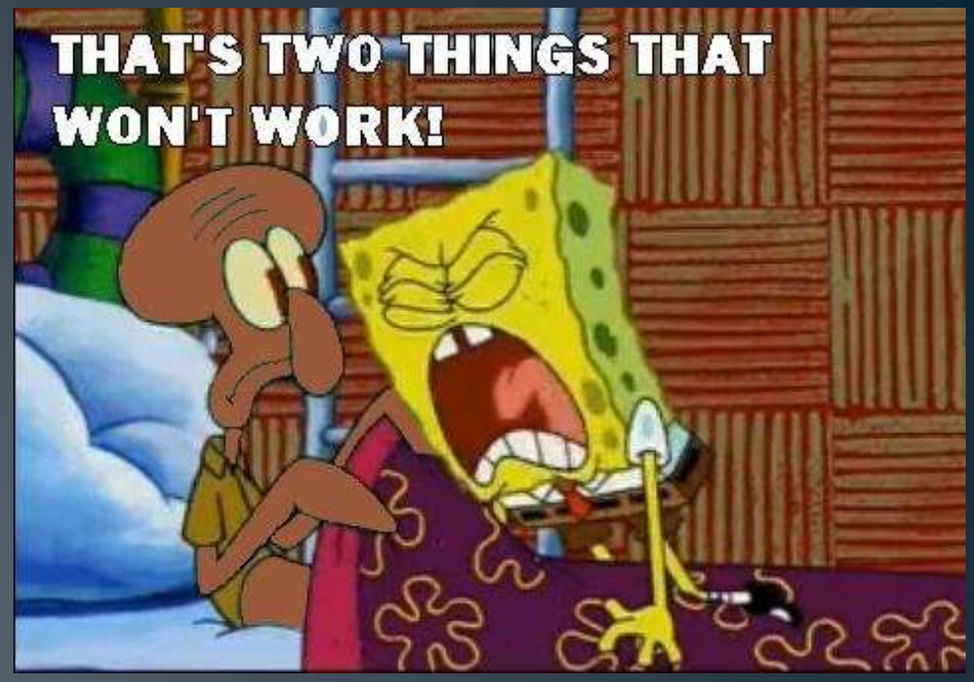
. More severe and treatment more challenging

Facial Trauma Resulting in Epistaxis



INITIAL STEPS

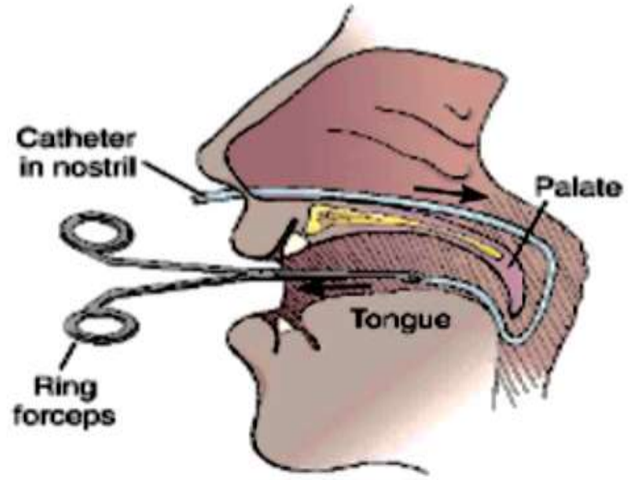
- Assessment of general condition
- Resuscitation if required
- Initial medical review



FIRST AID

NASAL PACKING

POSTERIOR



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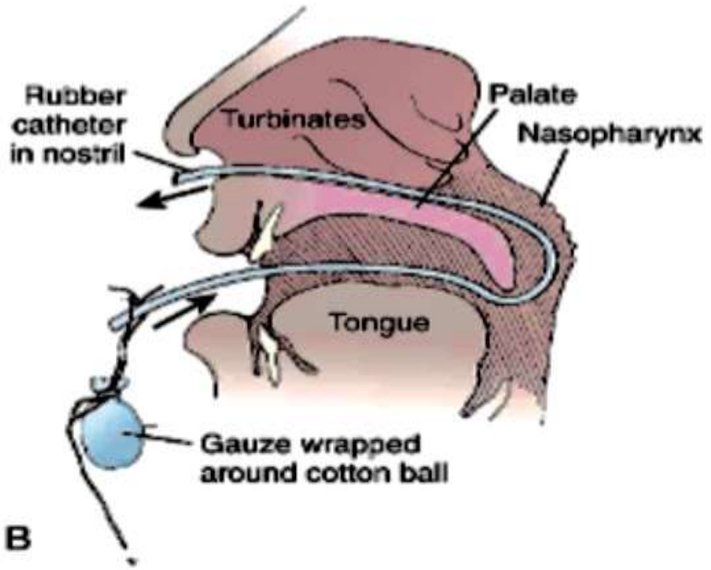

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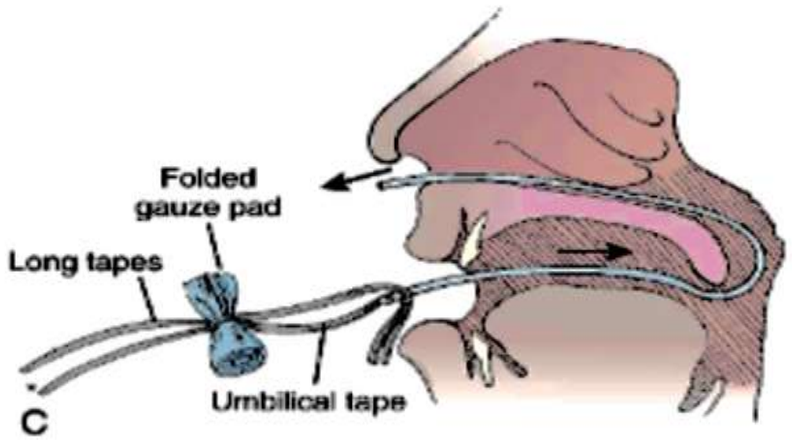

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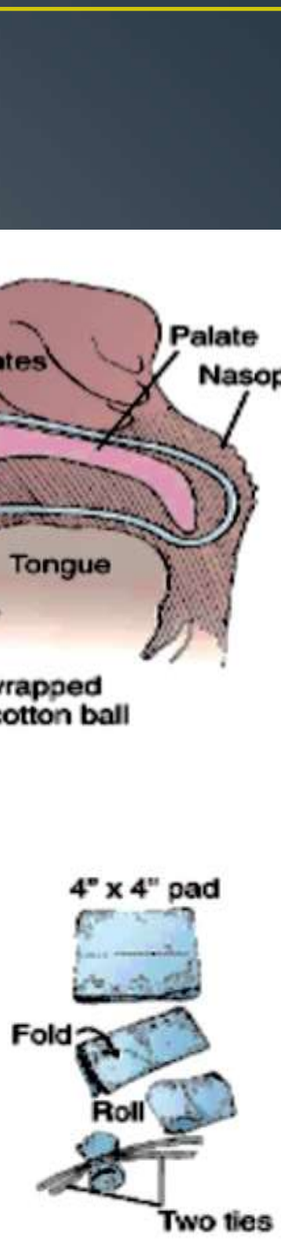

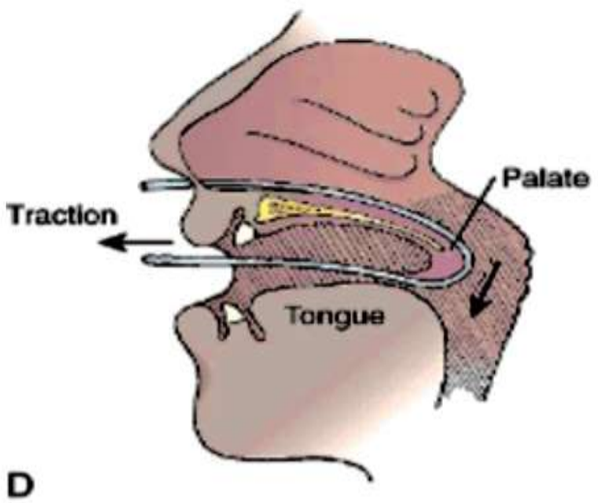

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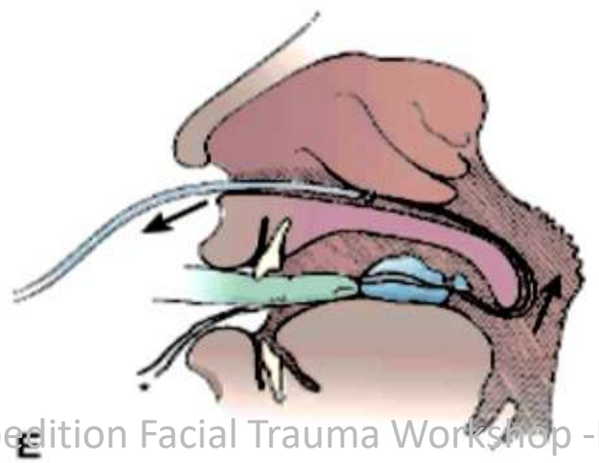

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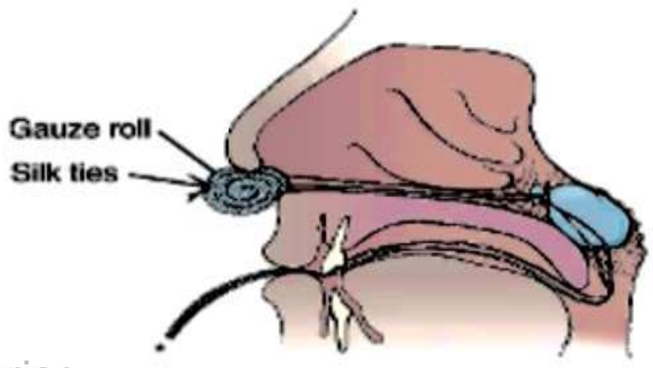
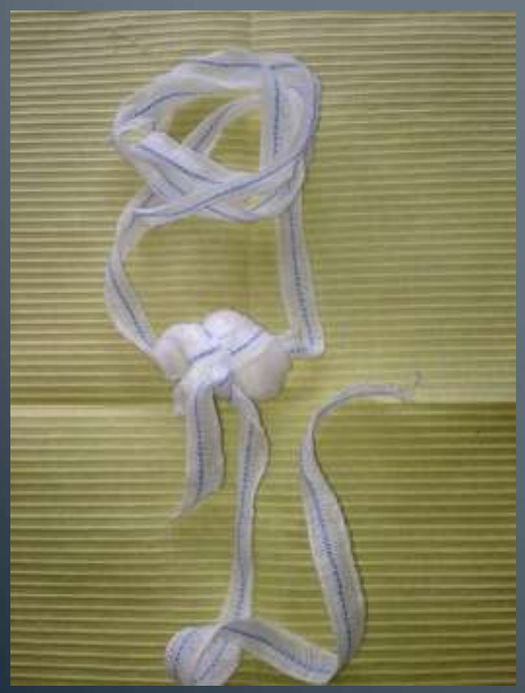
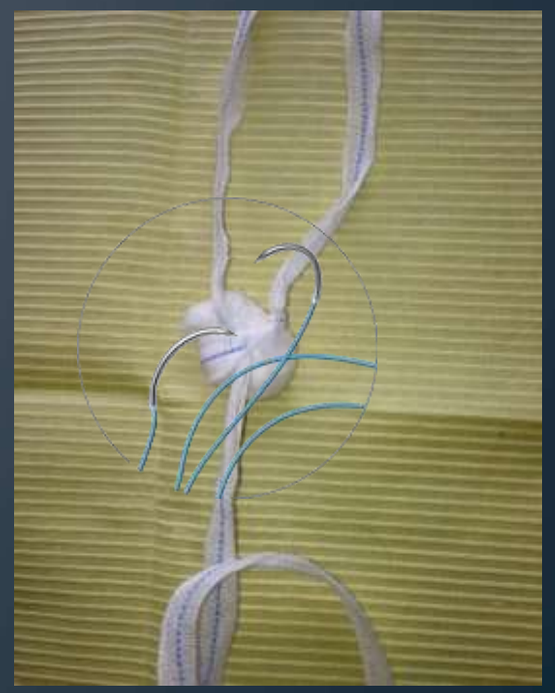


F

Post Nasal Pack





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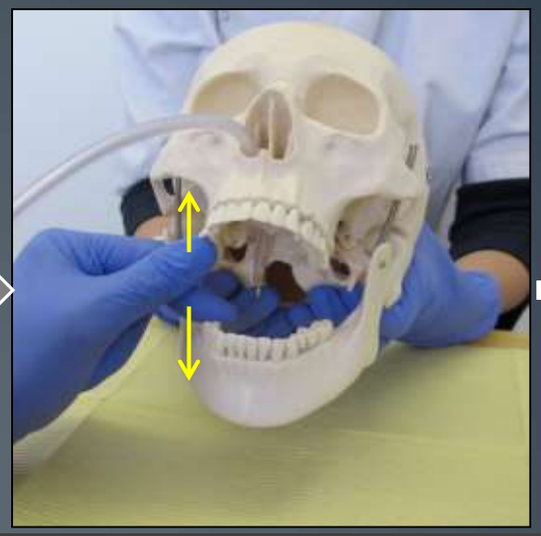
Hands On Exercise– Posterior Nasal Packing

1) Slide catheter along RT nasal floor

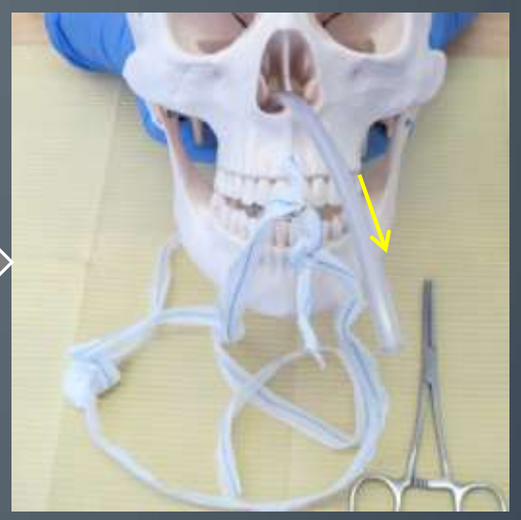
2) Pushing gently to Posterior aspect

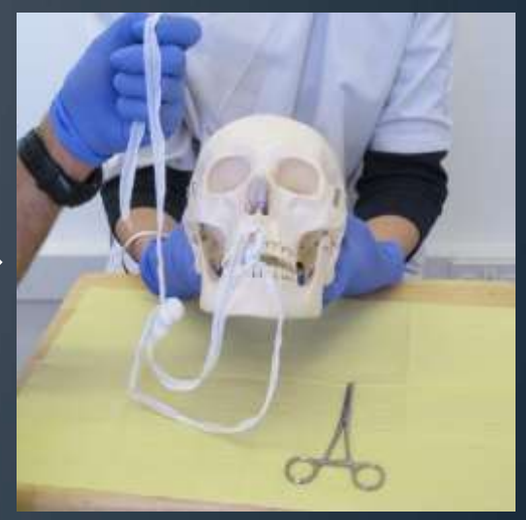


3) Open the mouth- By Crossing thumb and index Finger. Thumb pushing upwards Index finger downwards

4) Grasp Catheter as it Emerges from posterior aspect of palate with artery clip

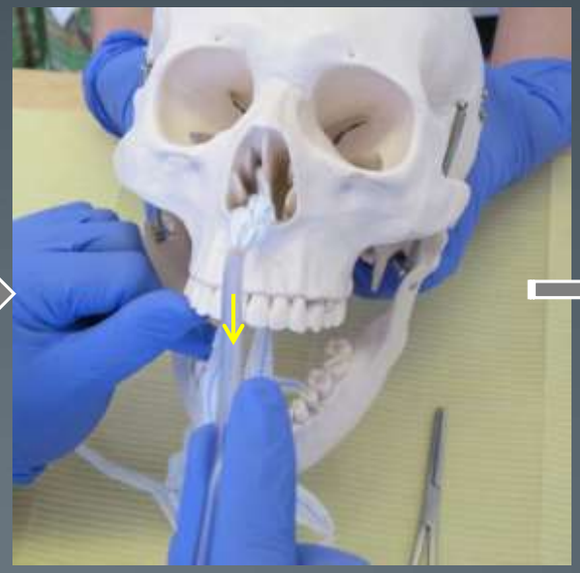
5) Emerged end of catheter Is pulled out from the mouth



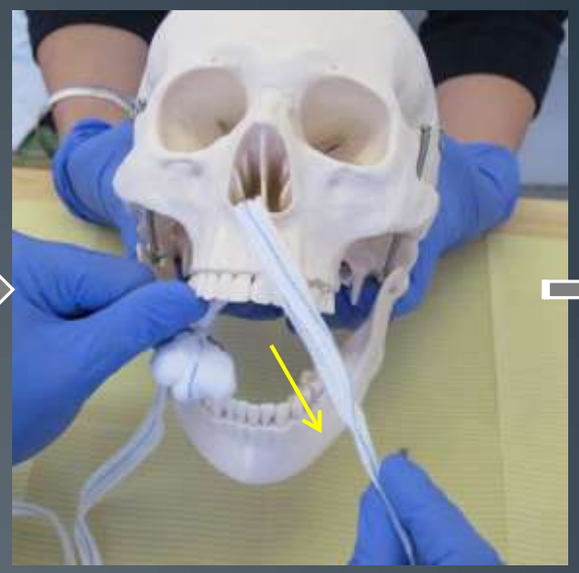


6) Double ended tail(Umbilical) of posterior nasal pack is tied to catheter

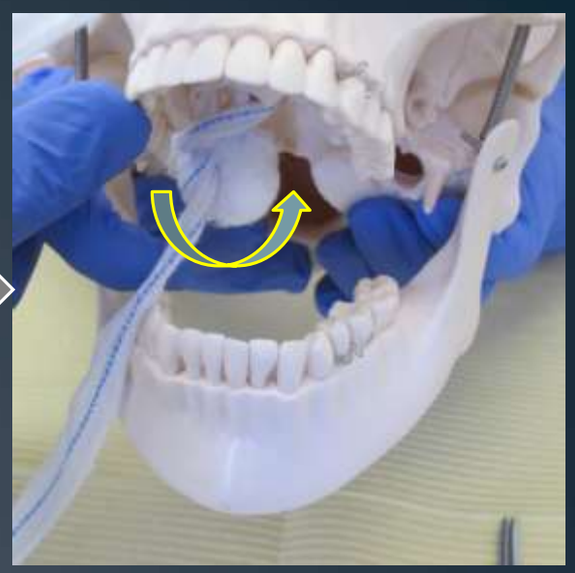
7) Catheter is pulled out Gently



8) Double ended tail (Umbilical) of tied post nasal pack comes out with catheter



9) Guide post nasal pack around the back of the Hard palate as you pull gently on the double Ended tail

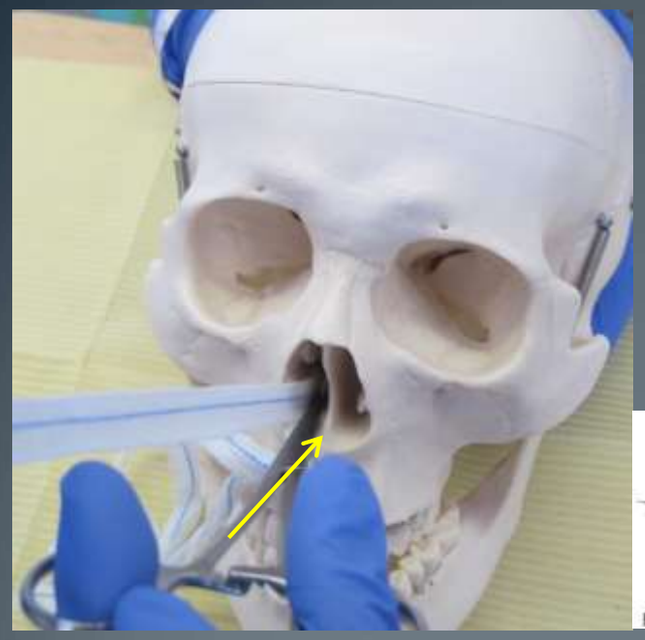


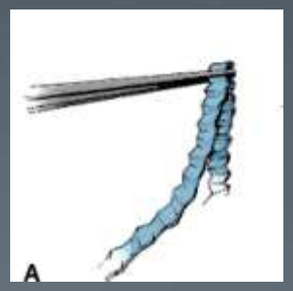
10) Using index finger tuck in to firmly seat the post nasal pack.

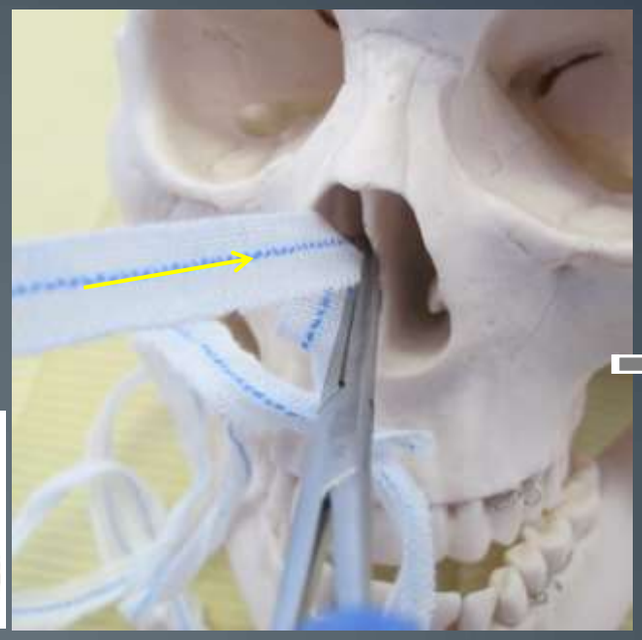
11) Untie the Double ended Tail(Umbilical) from the catheter

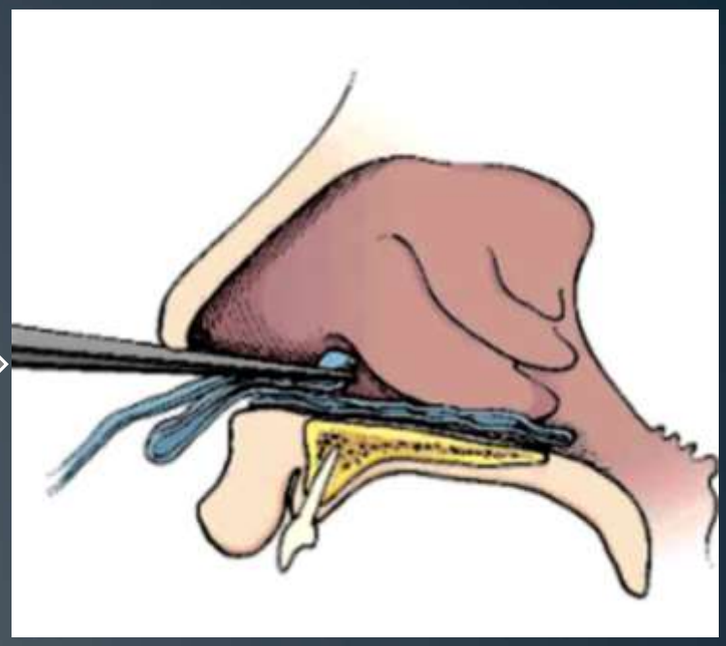
12) Ends are tied to Stabilise.

Hands On Exercise– Anterior Nasal Packing

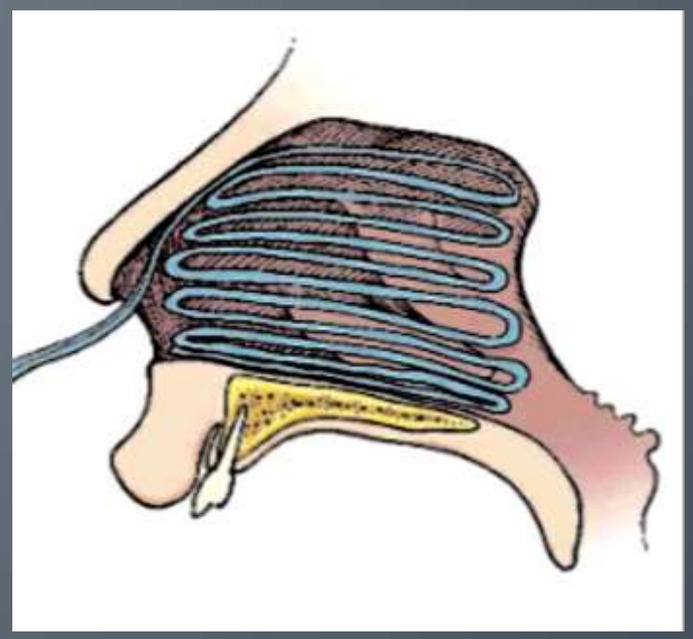


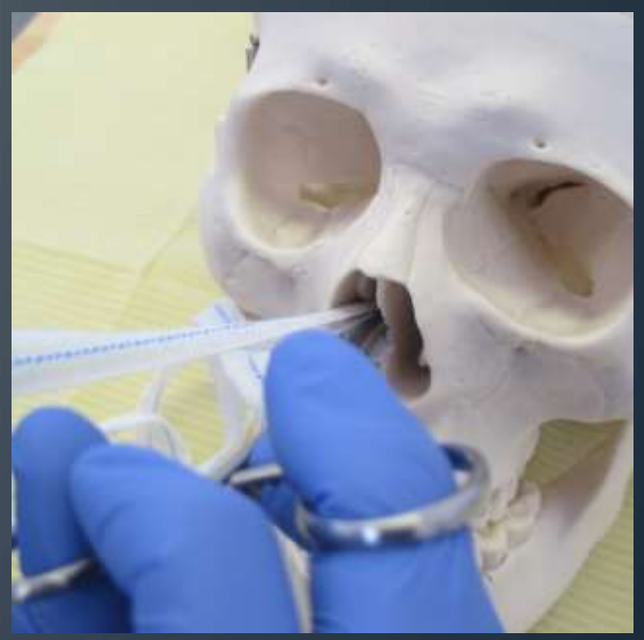






Hold the end of the ribbon gauze and slide it along the nasal floor. Fold the rest slowly in layers to the apex of the nasal cavity





- Best to place patient on antibiotics to decrease risk of sinusitis and toxic shock syndrome
- Advise patient to avoid straining, bending forward or removing pack early

PLEASE REPLACE MATERIAL BACK ON THE WHITE TRAY IN THE SAME LOCATION

Patient can't close his/her mouth- Its now an **DISLOCATED JAW**- This **MODULE** will train you in how you can a) Diagnose b) Reduce- i)Traditional Technique ii) Newer Conservative Technique

Hands on

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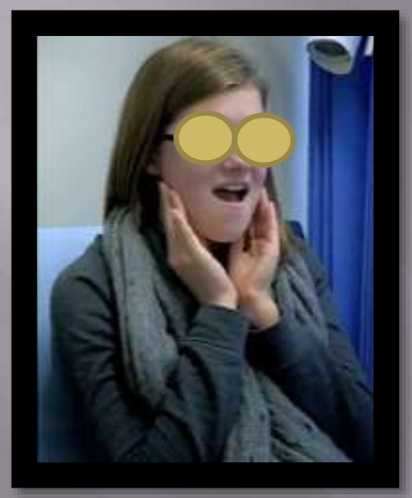
DOC I CAN'T CLOSE MY MOUTH !

- TMJ dislocation may occur with trauma, but most often follows extreme opening of the mouth during eating yawning, laughing, singing, vomiting, or dental treatment .

- **Symmetric** mandibular dislocation is most common, but **unilateral** dislocation with the jaw **deviating** to the **opposite side** also can occur.

OR

- **TMJ dislocation is painful and frightening for the patient.**



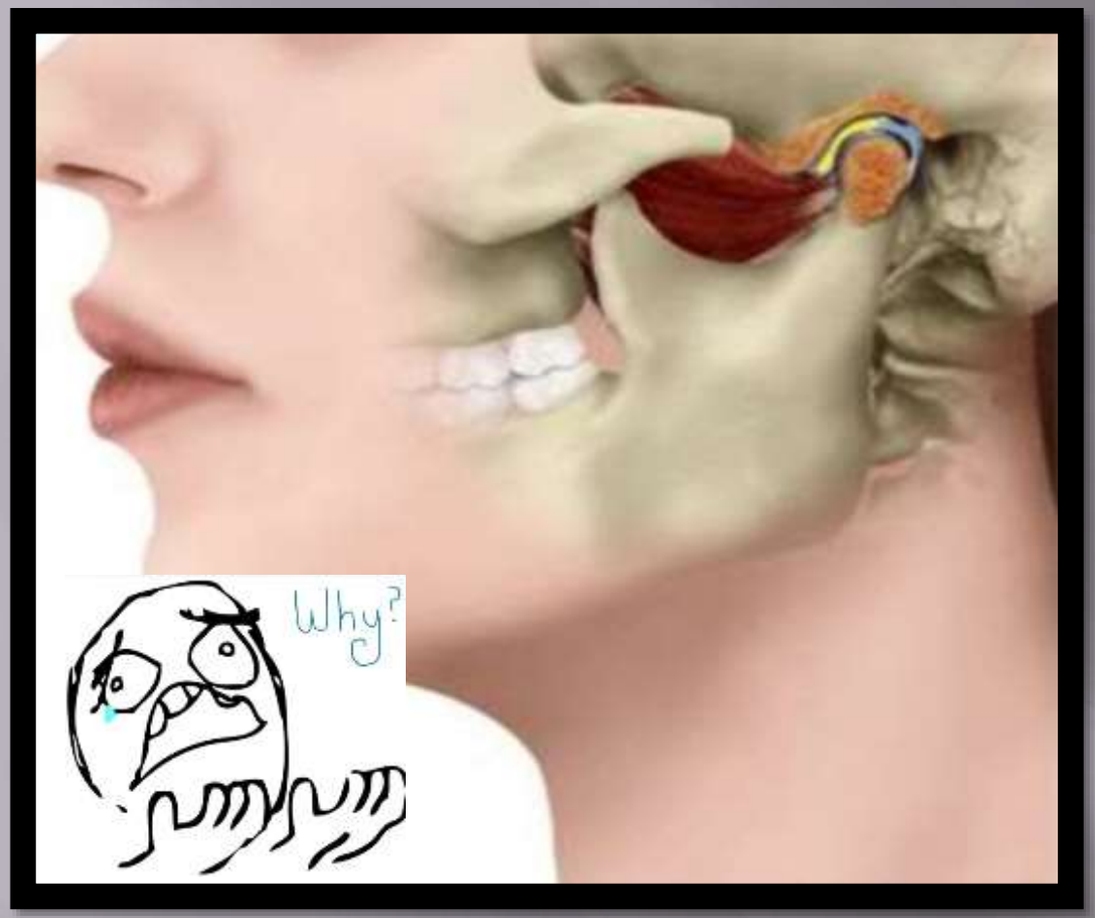
- **Often associated with severe muscular spasms.**

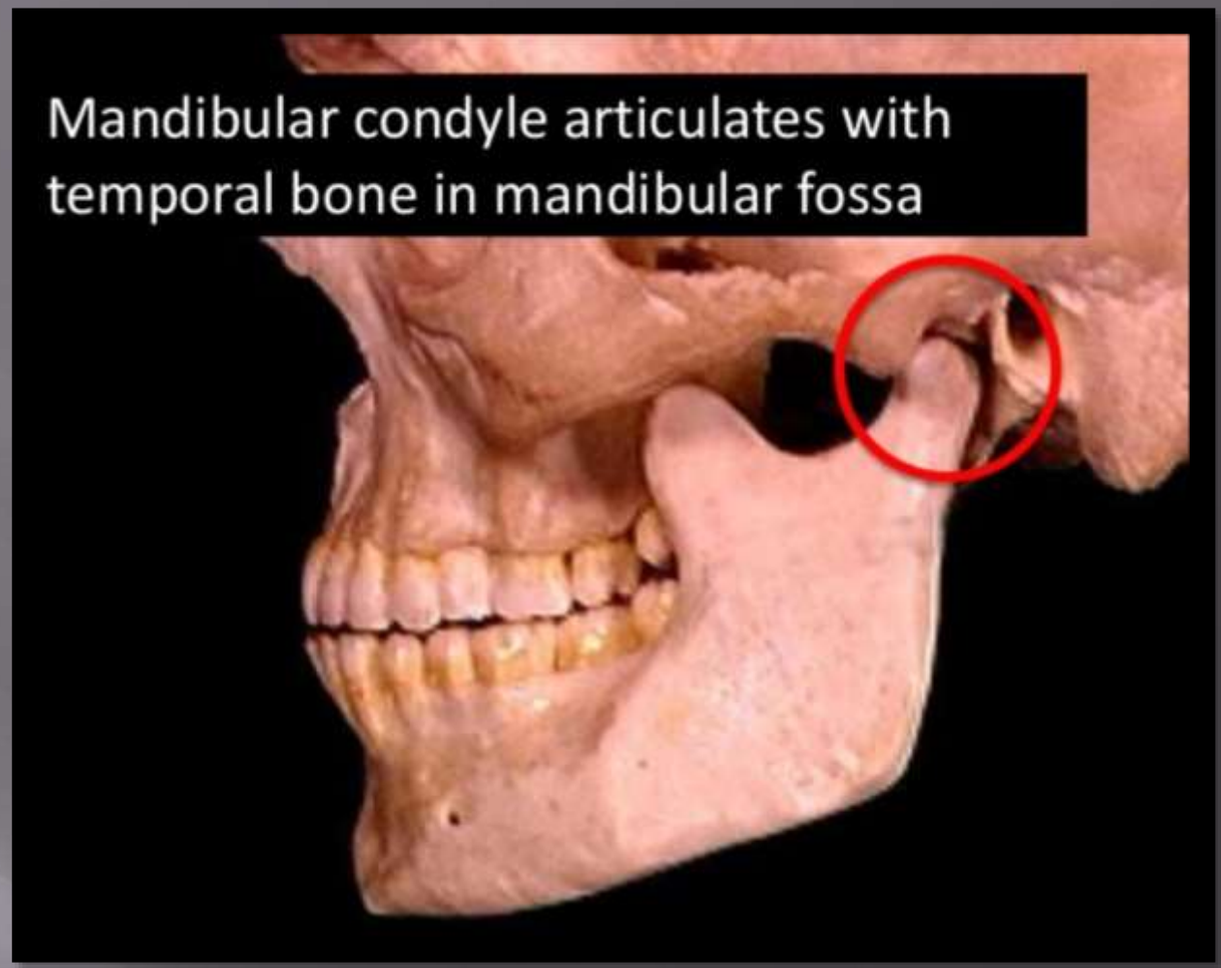
- The patient is unable to close the mouth and there is excessive salivation .

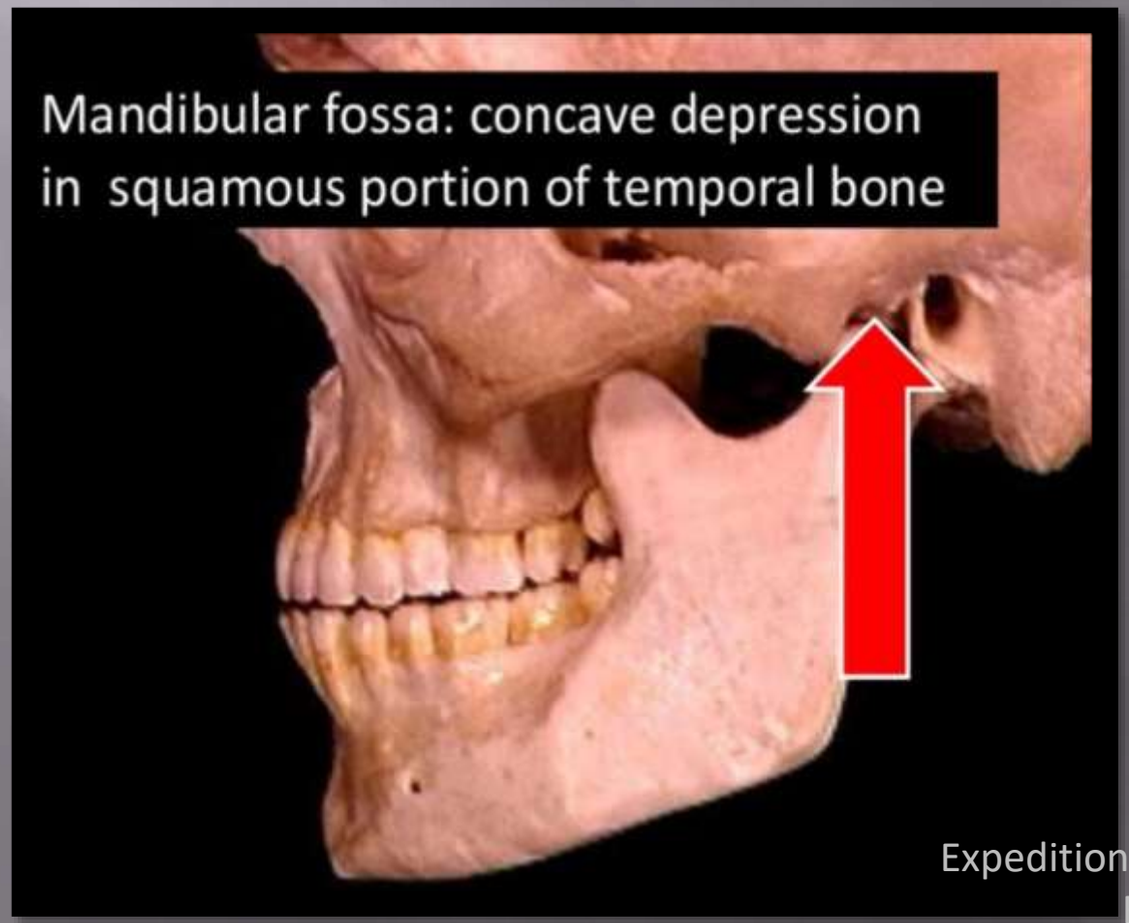
- A depression may be noted in the preauricular area.

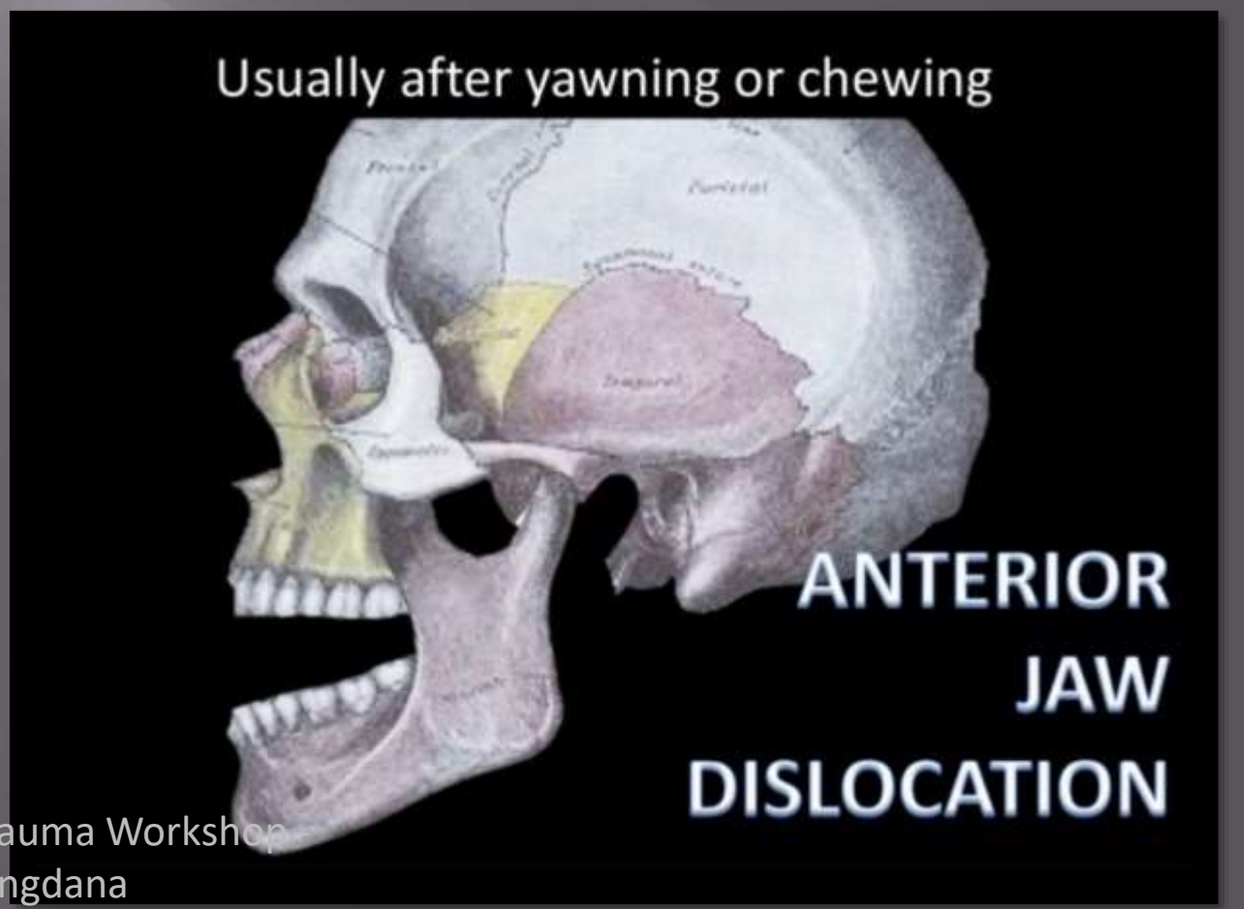
- Palpation of the TMJ reveals one or both of the condyles trapped in front of the articular eminence and spasm of the muscles of mastication.

WHY DOES THE JAW DISLOCATE ?









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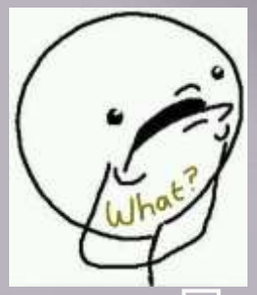

Traditional – Method of Reduction

- Most common: a)**Gag Reflex** b) **Intraoral route-**
- You: gloved with thick **gauze taped** securely on both **thumbs**.

- Place **thumbs on lower molars** or on ridge of the mandible intraorally, posterior to molars, with your **fingers wrapped externally around mandible**

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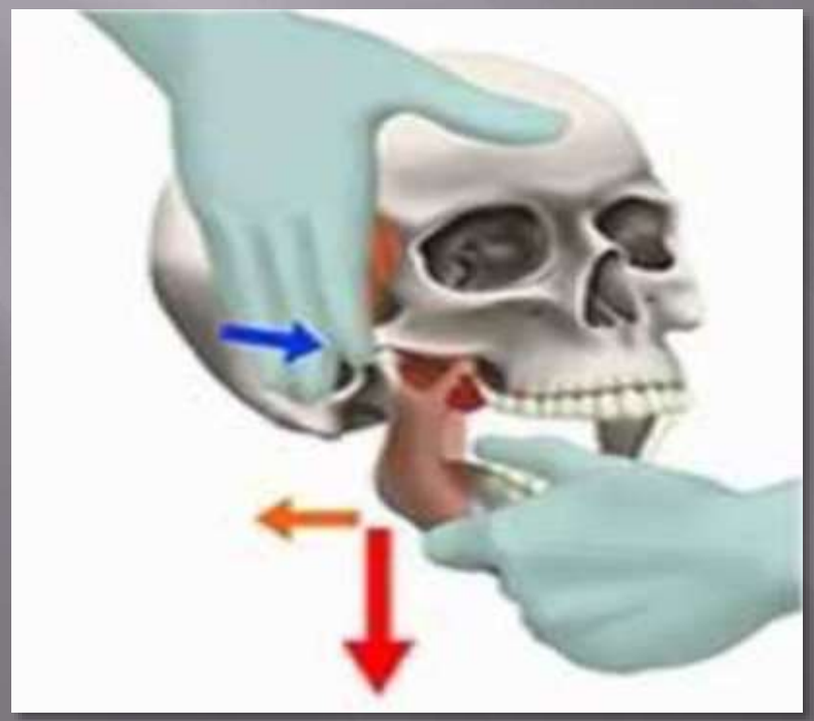
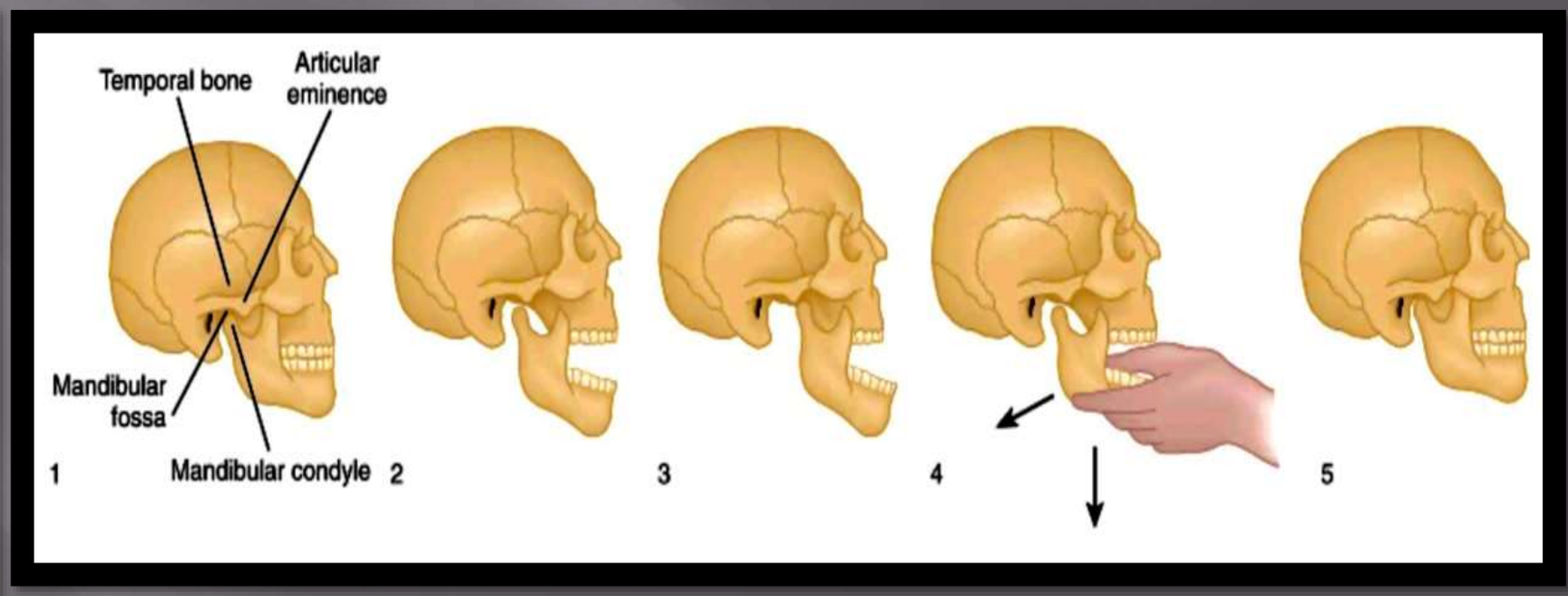
Traditional – Method of Reduction

- With patient positioned so mandible is below level of your elbows, apply firm, slow, and steady pressure in a downward and posterior direction
- If bilateral reduction is not possible, you can reduce one side at a time



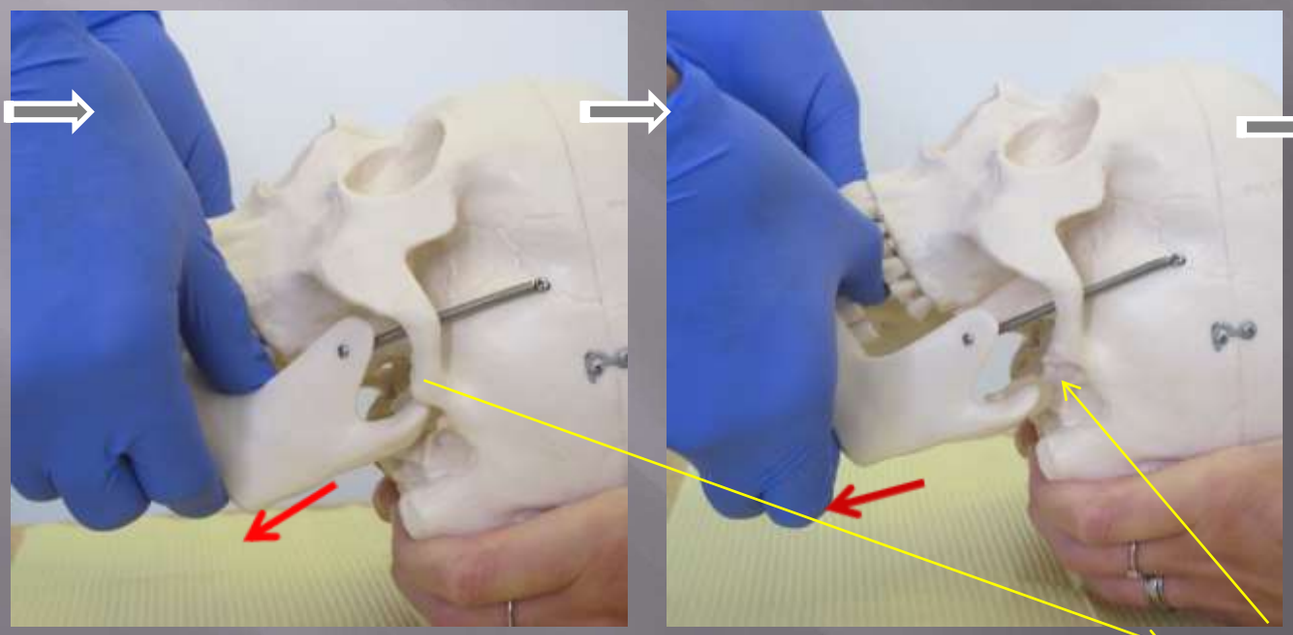


Hands On Exercise– First Dislocate The Lower Jaw

Colleague holds Mr Skull from the Back firmly. Wrists rest on table.

3) Open the mouth- By Crossing thumb and index Finger.

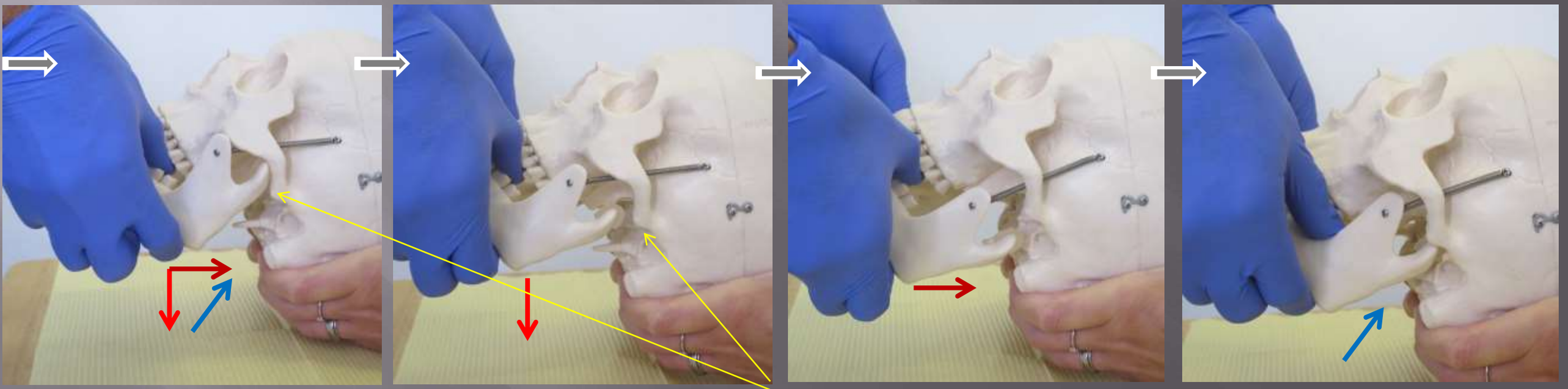
Thumb Rests on top surface of last lower tooth. Rest of Fingers on lower border of Mandible



1) First Force is DOWNWARDS to push condyle over the Articular eminence. 2) Second is FORWARDS to guide it in front off the Articular eminence 3) Guiding UPWARDS into the dislocated position.

Hands On Exercise– Reduction Of A Dislocated Jaw

Thumb Rests on top surface of last lower tooth. Rest of Fingers on lower border of Mandible

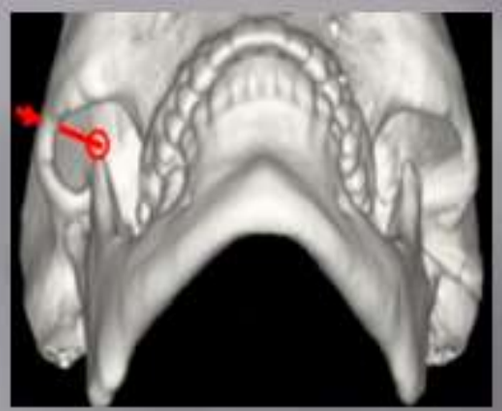
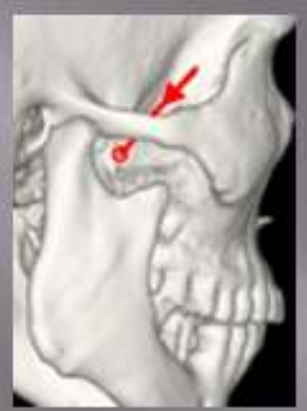


1) First Force is DOWNWARDS to push condyle over the Articular eminence. 2) Second is BACKWARDS to guide it behind the Articular eminence 3) Guiding UPWARDS as it clicks into its fossa

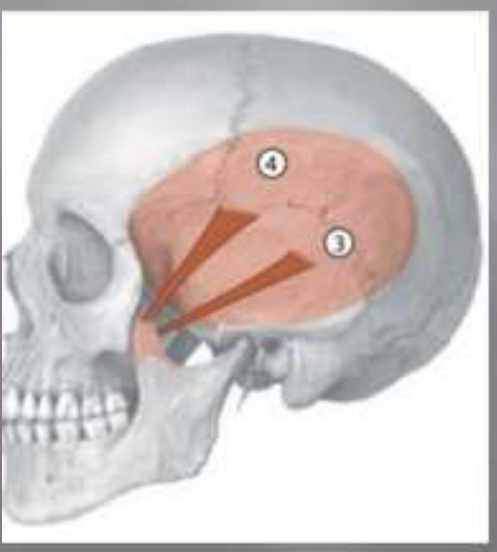
What about the Myospasm?

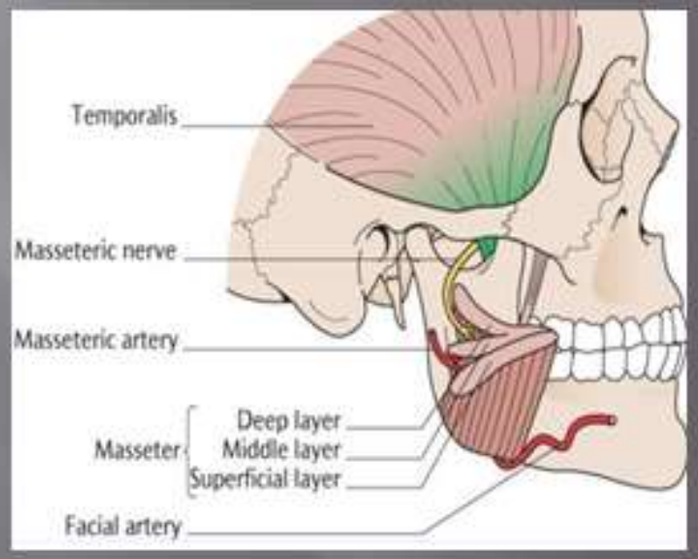
What about the Myospasm?

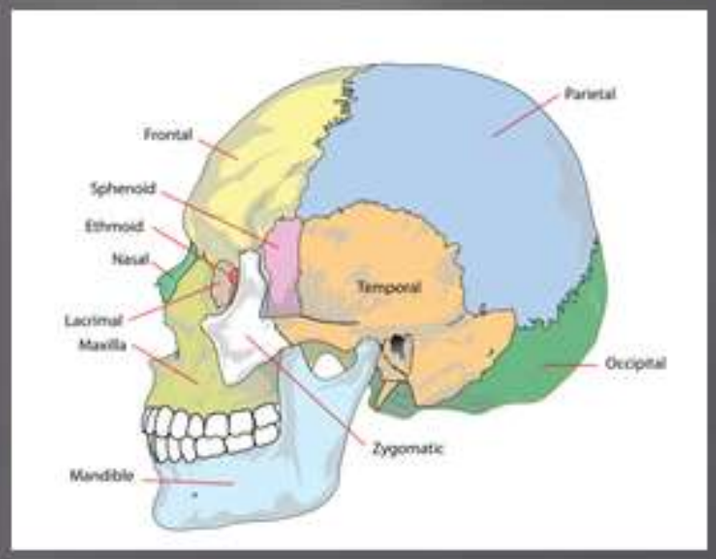
- The **faster** you **reduce** the **less** is the myospasm
- However you may not be present to treat the patient. This **uncontrolled delay** may precipitate a **self propagating** myospam. Then how can you get around this especially in an expedition setting?

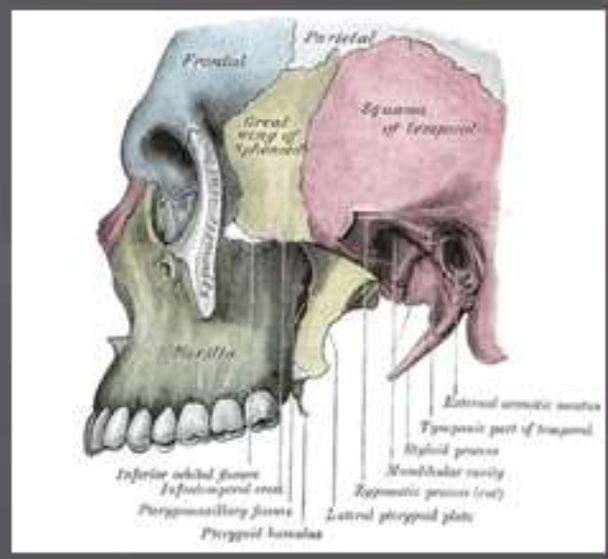




Regional anaesthesia- Deep Temporal & Masseteric nerve block. Above Zyg arch till hit sphenoid bone.In mandibular notch posteriorly to condyle. Sedation/IV Analgesia









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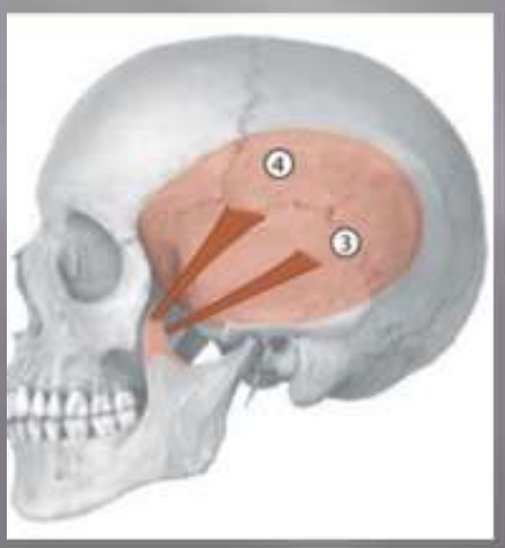

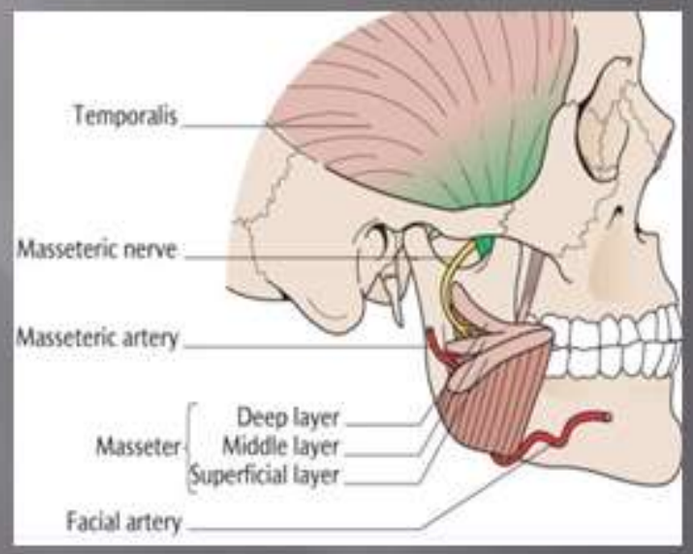

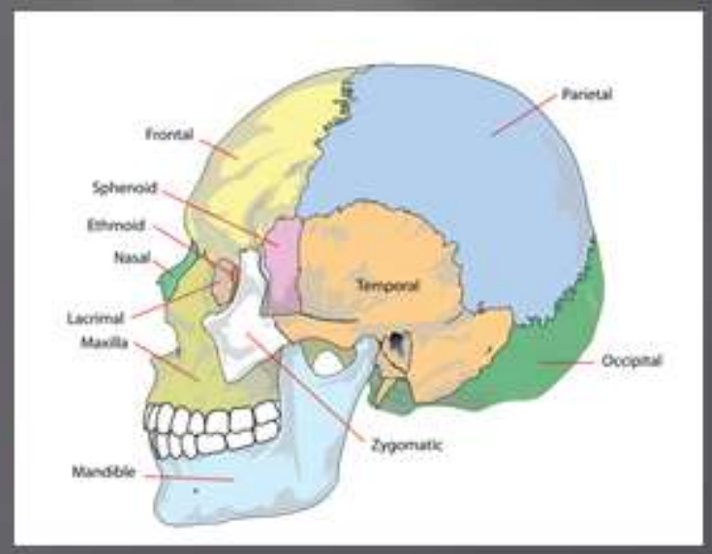

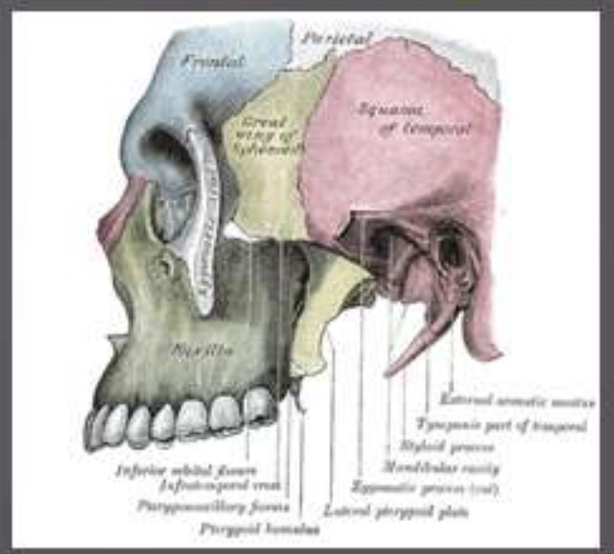

Expedition Facial Trauma Workshop 2016- Burjor Langdana

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Tape numerous tongue spatulas. Enough of them so that patient with dislocated jaw opens widely and rest on them. To do this for a minute. This will relieve myospasm(reciprocal relaxation) sufficiently to reduce the dislocation

A New Concept

The "Syringe" Technique: A Hands-Free Approach for the Reduction of Acute Nontraumatic Temporomandibular Dislocations in the Emergency Department

Julie Gorchynski, Eddie Karabidian, Michael Sanchez

The Journal of Emergency Medicine, Volume 47, Issue 6, December 2014, Pages 676–681

Wow – really??

- 31 patients with acute nontraumatic TMJ dislocation
- 30 had successful reduction
- 24 were reduced in less than 1 minute
- No recurrent dislocations at 3 day follow-up

Technique

- Patient in sitting position.
- Syringe size depends on distance between upper and lower molars / gums and patient's ability to open mouth

- Place syringe between posterior upper and lower molars or gums. Syringe acts as rolling fulcrum

- Have patient gently bite down and roll syringe (rolling fulcrum) back and forth.

As molars / gums roll over syringe ➔ mandible glides posteriorly

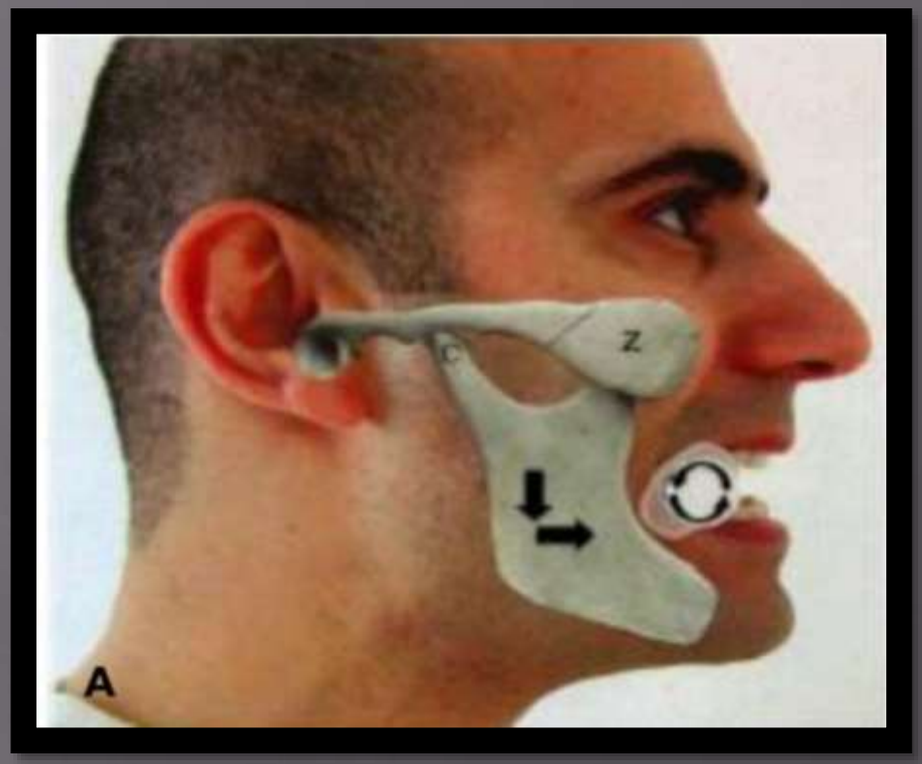
Technique

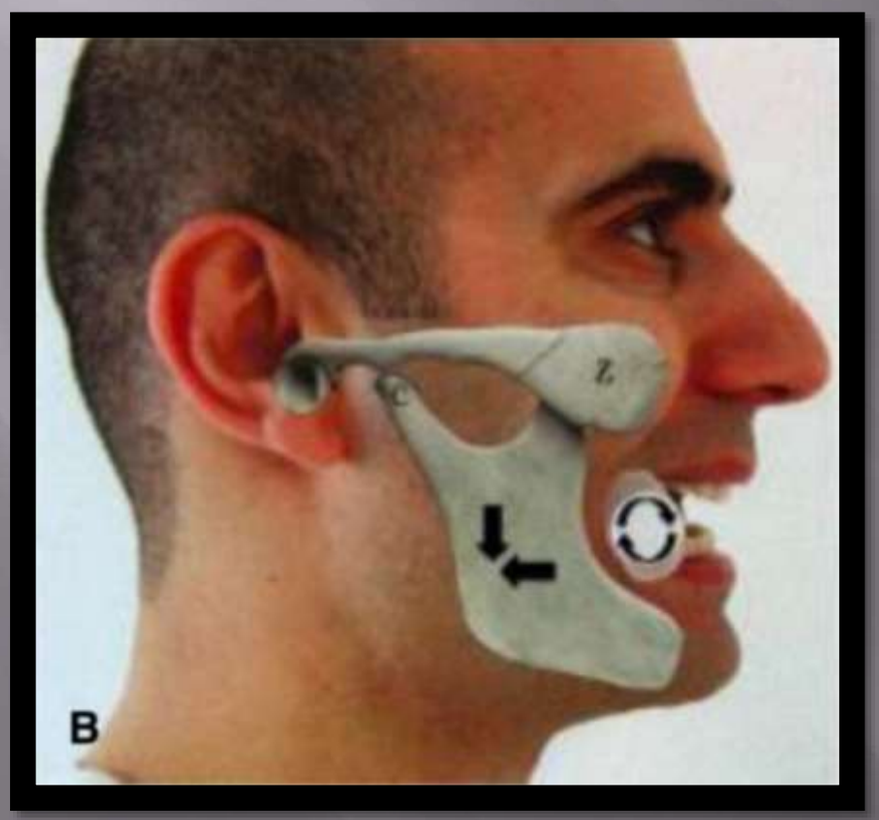
- Anterior **displaced** condyle moves **posteriorly**
- Masseter, pterygoid, and temporalis muscles work in **concordance**
- Condyle **slips** gently back into its **normal** anatomical position

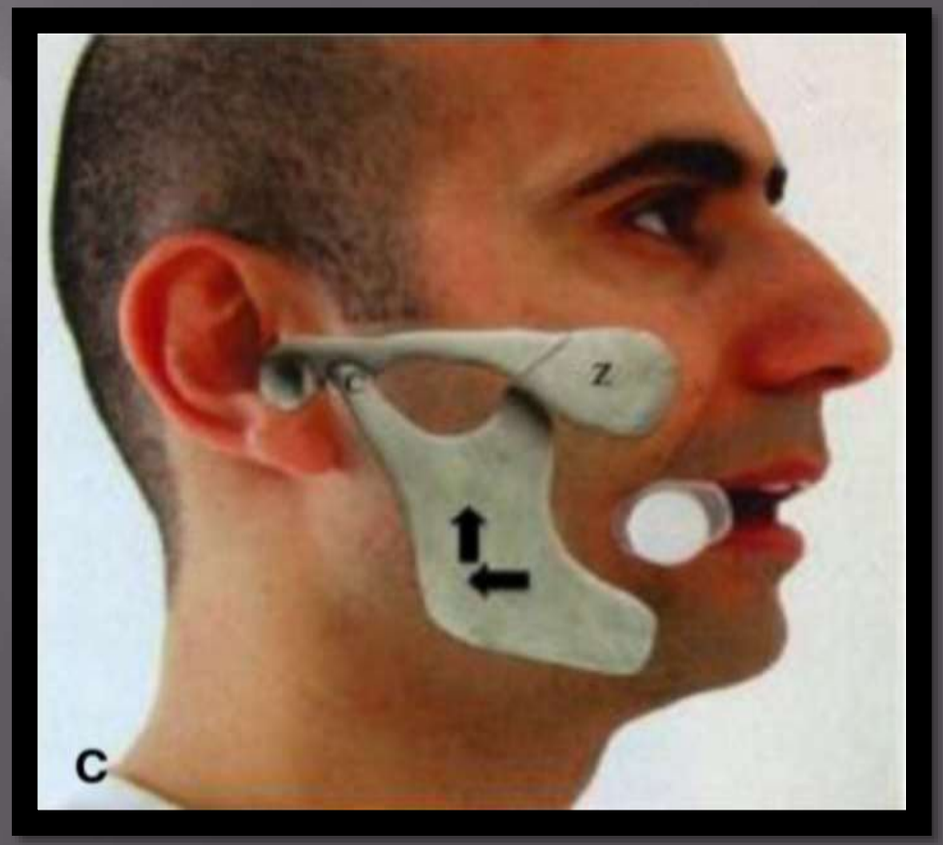
- **AFTERWARDS-**
  - Cool Compress
  - Barrel bandage/ Liquid diet- 48 hours
  - Soft diet- 7 days
  - NSAID- 3 days

Hands On Exercise– Reduction Of A Dislocated Jaw Non Traditional Technique

If you have pre existing TMJ issues, like clicking and pain.
Don't do this exercise







THE END…….

For remote access dental queries you can contact me at expeddental@gmail.com