

AM GUIDE TO MANAGING JAW JOINT DISLOCATION ON EXPEDITION

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This article is the sixth of our series and aims to provide you with some guidelines on managing acute non – traumatic temporomandibular joint (Jaw joint) dislocation. in the field. For more in the series: check out [AM Dental section](#)

Background

Most medics will have had little experience with jaw dislocation. It only represents 3% of all joint dislocations. (1) While it has not been uncommon for these to be relocated under sedation or anaesthesia, it is very treatable without sedation, especially if attempted early (2). Therefore, all expedition medics should be comfortable to assess, diagnose and manage a dislocated Temporomandibular Joint.

There is a shriek around the campfire “she can’t close her mouth”. You rush over finding this frightened young woman in acute pain. She has saliva drooling from her mouth. Her mouth seems locked open. You are in the middle of nowhere. There is no access to anaesthesia or sedation. What can you do ...?

The article and slideshow aim to:

1. Describe how to diagnose acute temporomandibular joint (jaw joint) dislocation.
2. Demonstrate the various treatment options with a stepwise escalation when treatment options fail.
3. Describe the considerations and management of the prolonged dislocation.

Diagnosis

The Patient

- 1) Acute Pain (especially anterior to the ear) due to major myospasm associated with the dislocated joint.
- 2) Difficulty in speaking due to inability to open or close mouth. Give them a means to write so they can tell you how it happened.
- 3) Excess salivation as they may find swallowing impossible. This will make taking any medication difficult.
- 4) The patient should **not** have any trouble breathing or stridor. If this is the case, consider alternative diagnosis such as retropharyngeal swelling and/or infection.

What you see

- 1) Normally the jaw is displaced anteriorly with bilateral dislocations. The mouth will be held open, lower jaw appears prominent with midline maintained.
- 2) Occasionally dislocation could be unilateral and the midline of the jaw will deviate to the side opposite to the dislocation i.e. to the normal side. Look at the relationship of the upper and lower incisors as a reference point.

- 3) Rarely dislocations can occur posteriorly, laterally or even superiorly. (3, 4, 5) These tend to be more common with trauma and can be more easily missed.
- 4) You should **not** see neck swelling or haematomas under the tongue.

What you feel

- 1) Hollowing in front of the tragus.
- 2) You should **not** feel any crepitus or instability of the jaw or swelling in the neck.

Why did this happen?

Wide open mouth (yawning, eating, laughing, singing) and an underlying susceptibility. It is even possible during routine dental checks!

- Condyle (The rounded projection of the lower jaw that fits into the fossa of the temporal bone) moves onto articular eminence (The raised area of bone at the anterior limit of temporal fossa),
- Condyle slips forward,
- Preventing the mouth from closing.
- Powerful masticatory muscles tighten/spasm
- These biting muscles easily overpower the weaker mouth opening muscles
- The mandible is then held in this new 'open and protruded' position
- Causes a reinforcing cycle and muscles contract further
- The mandible becomes 'locked' in this position.

Dislocations and fracture dislocations can occasionally occur with trauma (5) and in these cases it is important to ensure

- the airway is not compromised
- c-spine injury is considered
- tooth avulsions are located (if they cannot be found, assume they are in the right main bronchus)
- tooth avulsions are relocated (as per previous AM article)
- mandibular fractures are considered (look for gum-line bleeding, sublingual haematoma)
- the external auditory meatus is examined for bleeding or occlusion (posterior fracture/dislocations (3))
- the mastoid area is examined for bruising (Battle Sign-Basilar Skull fracture due to posterior dislocation (16))

As per the articles on dental trauma, it is likely these patients will require medevac and operative reduction. The techniques described below are not suitable for these types of dislocations.

What can you do? Relocation options

1) Hippocrates (6)/ Traditional intraoral method (7)

a) Reposition mandible both sides at the same time:

- Seat patient lower than you
- You place your thumb inside the mouth. Your thumb will rest on the top (occlusal surface) of the lower molar teeth
- Your remaining fingers are outside the mouth. They will extend along the lower border of the mandible from angle to chin.
- You then exert downward, steady, constant pressure on patients' lower molars with your thumb.
- While the remainder of your fingers and hand around chin are levering upwards.
- As myospasm is overcome you will feel a give sensation

- Then guide mandible posteriorly and upwards
- b) Reposition mandible one side at a time: (8)
- Fix the patients head between your body and non-dominant hand
 - Place thumb of your dominant hand onto the occlusal surface of the last molar of the side of the jaw to be repositioned
 - Grip the mandible with the rest of your hand
 - Apply gentle but increasing downward pressure
 - Gradually increase the force for up to 5 minutes until you feel condyle move
 - Guide upwards and backwards very slightly until you feel condyle slide into fossa.
 - After reducing one Temporomandibular Joint (TMJ). Hold it in position with your non-dominant hand by positioning a finger in front of the reduced condyle.
 - Then reposition the other TMJ in the manner stated above.

How to avoid getting bitten

1. Instruct the patient – you will guide the jaw in its closed position and they should not contribute by attempting to bite.
2. Gauze wrap around thumbs
3. Place thumb on bony ridge present on cheek side of mandibular molars, rather than on the top surface of the molars.
4. Consider using syringe Technique.
5. Consider using the Extra Oral Technique

2) 'Syringe' or Lever Technique for reducing TMJ dislocation; (9,10)

This technique had a 97% success rate in one series (9) when the patients presented within 2 hr of dislocation. It utilises the patient's own strong masseter to pivot the jaw around a fulcrum pushing the mandibular condyle down and back into place.

- Choose the right size of syringe (5 to 10 ml) or similar sized rigid cylindrical-shaped item. Wide enough for the patient to rest/bite on in the dislocated position i.e. 2-3cm. This could even be a roll of gauze, as described in the 'lever' technique.
- Place it between the upper and lower molars on one side.
- Tell patient to gently bite down.
- Patient is then encouraged to roll the syringe back and forth. By protruding mandible forwards and retruding it backwards. Gradually more and more movement will be tolerated.
- Simultaneously you assist by grasping end of syringe protruding from side of mouth. And rotating it forwards and backward.
- Syringe acts as a rolling fulcrum translating the force of the biting muscles to pivot the back of the jaw back into its socket.
- The opposite side reduces spontaneously.
- If this does not occur, the syringe should be placed on that side as well.

3) Extra-Oral Technique for reducing TMJ dislocation; (11)

- Patient in sitting or supine position.
- You stand in front of patient.
- You place your thumb on patient's cheek, on the coronoid process of the dislocated mandible. Your thumb then applies persistent posterior pressure. The rest of the fingers of this hand are placed behind this same mandible, posterior to the mastoid process, stabilising the grip.

- Simultaneously on the opposite side. You then place your thumb on the malar eminence (cheek prominence) and your fingers around the angle of the mandible. Applying an anterior force (Like jaw thrust manoeuvre.)
- Then, by pulling the mandible anteriorly and simultaneously using your other hand to push the coronoid posteriorly, the jaw rotates facilitating contralateral TMJ reduction.
- Once one side is reduced, the other side will usually go back spontaneously.
- If this does not work apply posterior force on both coronoid process at the same time.

Problem solving – prolonged dislocation

You have been away from the campsite. Dislocation is now 24 hours old. Myospasm has set in. Traditional method of reduction is not working. You don't have access to sedation or GA. What can you do?

In this scenario you could then try:

- Ensure adequate analgesia. If possible, use IM medication as oral medications will be extremely difficult to swallow.
- Ask the patient to open widely against resistance, through reciprocal inhibition, the muscle tone of the elevator muscles is reduced and then manual reduction can be attempted.
- Syringe or Extra-Oral technique. It's claimed that they have a higher success rate in the presence of excessive myospasm.
- The Wrist Pivot Method – described below (12)
- If available, attempting regional nerve blocks – described below (13,14)
- If none of these methods succeed there will be no option but to arrange a medevac.

Wrist Pivot Method (12)

- Grasp the mandible at the mentum with both thumbs
- Place your fingers on the inferior molars
- Apply upward force on thumb and downward pressure with fingers.
- The forces should be applied bilaterally to avoid mandibular fracture.

Deep Temporal Nerve block (13,14)

- You will use a 30 gauge needle to inject approximately 0.5 to 0.8 ml of 2% Lignocaine with 1;100,000 adrenaline
- Take your index finger run it on the top surface of the zygomatic arch anteriorly
- Till the horizontal arch meets the vertical zygomatic process.
- This is the area of anterior temporalis muscle
- Insert the needle parallel horizontally to the index finger through the temporalis muscle to contact the bone (greater wing of sphenoid)
- Aspirate and inject
- Wait at least 2 minutes

Masseteric Nerve block (13,14)

- You will use a 30 gauge needle to inject approximately 0.5 to 0.8 ml of 2% Lignocaine with 1;100,000 adrenaline
- Take your thumb and middle finger. Grasp the anterior and posterior border of the ramus of the mandible, extra-orally, visualising the width of the ramus
- With your index finger. Locate the zygomatic arch. Follow to a point midway between thumb and index finger.

- Slide index finger inferiorly until it reaches the mandibular notch.
- Insert needle posteriorly, hitting the neck of the condyle approximate depth 7-10 mm
- Aspirate and inject.
- Wait atleast 2 minutes.

Now that you have successfully reduced the dislocated jaw joint. What is the post treatment care?

- 1) Verify normal bite/occlusion i.e. midline of upper and lower teeth match. The patient may feel that the bite is good but not exactly right. This is frequently just some residual swelling around the TMJ.
- 2) Cool Compress
- 3) Barrel Bandage (check slide show for method) The patient may find the use of a cervical spine collar helpful (15)
- 4) Liquid diet for 48 hours
- 5) Soft Diet for 7 days
- 6) NSAID for 3 days
- 7) Follow up with their dentist when they return home.

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