Sporting injuries to the temporomandibular joint

Précis:
This short article reviews the diagnosis and management of potential sporting injuries to the temporomandibular joints.

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Introduction

While some of injuries to the temporomandibular joint (TMJ) are of an acute nature, they may resolve relatively quickly and with limited treatment. A small number of acute injuries do not resolve fully and become chronic. Chronic injuries may be characterised by persistent pain and limited function, requiring long-term therapies to restore normal sensation and function. The factors influencing the transition from acute to chronic injury are complex and include genetic, psychological and physiological responses that are difficult to predict.

Injury to the head and neck area may result in damage to muscles, joints, teeth and bone. Injuries may occur in isolation or in combination, thus increasing the diagnostic and therapeutic challenge for the treating clinician. For example, cervicogenic pain located in the upper segment of the cervical spine frequently refers to the orofacial region (e.g., the angle and lower border of the mandible, and/or the TMJ). This happens as a result of neural pathways from the cervical spine connecting with the spinal tract of the trigeminal nerve in the brain stem. Thus, apparent discomfort in the TMJ and adjacent tissues is not always indicative of underlying injury to the joint. Similarly, undetected dental injuries may provoke painful responses that influence muscle and joint function.

The assessment process must include the possibility that more than one type of tissue was injured. Failure to carry out a comprehensive assessment may result in misdiagnosis, with continuing discomfort and disability for the affected patient.

Acute capsulitis

Direct trauma to the face may trigger an acute inflammatory response in the TMJ. The immediate response to irritation of the synovial tissues lining the joint is sensitisation of peripheral nociceptors (leading to pain) and an increased volume of synovial fluid within the joint space. This is a relatively common form of acute injury in contact sports like football, hurling, rugby, hockey, martial arts, etc. The condition is characterised by the development of immediate swelling in and around the joint, painful function of the mandible and occlusal changes. The increased volume of fluid with the joint causes displacement of the affected condyle-disc assembly anteriorly and inferiorly.[1] The displacement may be small but patients perceive a sense of occlusal change on the affected side, having difficulty in bringing the posterior teeth together. There may also be a degree of lateral displacement if the injury is severe enough, with the midline of the mandible shifting towards the opposite side.

Assessment of the patient should confirm that the onset of symptoms was immediate after the injury. Clinical and radiographic assessment must rule out bony fracture and/or infection, i.e., findings that would not be consistent with an acute capsulitis. A pan-oral radiograph (orthopantogram) is the radiograph of choice for TMJ assessment and

there are only a few occasions when a CT or MRI scan is required. Although diagnostic terms like joint capsulitis and synovitis are by definition different entities, in practical terms it is difficult to differentiate between the two.

The therapeutic approach is largely symptomatic:
- apply an ice pack to reduce soft tissue swelling;
- prescribe anti-inflammatories to promote healing and reduce pain; and,
- adhere to a soft diet to minimise functional discomfort.

The choice of anti-inflammatory is extensive and at the discretion of the dentist. Ibuprofen 800mg three times per day is regularly used for adult patients. Vimovo is a combined preparation of naproxen 500mg and esomeprazole 20mg (a proton pump inhibitor), which can be prescribed as one tablet twice per day for four or five days. The newly available Keral sachet (dexketoprofen) has reduced gastric effects and should be taken three times per day. Patients should be reviewed after about ten days, when improvements in mobility and discomfort are generally noted. Full recovery takes place within a month or so, and the use of intra-oral appliances is of little value to the patient (given the likelihood of spontaneous recovery).

Acute closed lock (disc displacement without reduction)

Direct trauma to the face may result in a sudden displacement of the intra-articular disc, which is characterised by an immediate and significant reduction in the range of mouth opening. This condition is sometimes painful but not always so.[2] It may be difficult to differentiate between an acute closed lock and an acute capsulitis. MRI studies on joints with acute disc displacement suggest that the disc generally tends to be displaced anteriorly and medially, but similar symptoms may also occur when the disc adheres to the roof of the fossa.[3] With a locked joint the mandible tends to deviate towards the affected (painful) side, and there is generally no report of occlusal changes (no difficulty in bringing the posterior teeth together on the affected side). The full extent of mouth opening is frequently in the 25-30mm range, in contrast to an acute capsulitis, where mandibular movement tends to be more flexible. Patients will sometimes be aware that clicking is no longer detectable in the symptomatic joint. Clinically, the range of movement is limited by what is termed a 'hard end feel'. In other words, downwards pressure on the mandible elicits a sense of rigidity in the lower jaw.
Findings from the clinical and radiographic examination should be clearly documented in the patient's record before providing treatment.

Recommendations for treatment include the following:
- explanation of the diagnosis and reassurance for the patient;
- control of pain with anti-inflammatories and/or paracetamol;
- an exercise programme to gradually restore mobility to the affected joint (facilitated by the application of hot or cold packs to the symptomatic joint);
- intra-articular injection when necessary to try and mobilise the disc and restore a normal range of movement; and,
- assessment from a maxillofacial surgeon with a view to considering arthroscopy, arthrocentesis or eminectomy.

Only a small percentage of patients with locked joints require surgical intervention, but in appropriately selected cases this approach can provide significant relief for the patient. Intra-oral appliances have traditionally been used in the treatment of TMJ problems. Despite the controversy on how appliances actually work, it is clear that they have a role to play. However, in the presence of an acute injury the usefulness of an intra-oral appliance is limited. The evidence would seem to suggest that appliances may have a preventive role, or they may offer mechanical support in joints recovering from injury.

Open locking

Open locking may occur spontaneously but may also be associated with facial trauma. The patient usually feels that the mouth is 'half open' and cannot close comfortably. The most common cause for this is movement of the whole condyle-disc assembly beyond the crest of the eminence onto the preglenoid plane. This condition is always unpleasant and in some cases patients become extremely anxious when this occurs. The level of pain experienced by the patient will vary. Patients who have hypermobile TMJs may develop open locking on a recurring basis and thus learn to self-manage the condition. When the open lock reduces easily there is little post-operative pain and normal function of the mandible is restored. However, it can also occur as a result of facial injury in patients who are not hypermobile. The resulting tissue trauma may provoke long-term discomfort with joint function.

The therapeutic approach should provide:
- explanation and reassurance for the patient;
- reduction of the open lock by applying downward pressure on the posterior teeth of the mandible;
- oral or intravenous sedation, which may be helpful when available;
- pain control with analgesics;
- post-operative review of the patient to determine if the joints are truly hypermobile or, in the absence of hypermobility, to determine the extent of tissue trauma; and,
- long-term follow-up to reinforce the concept of self-management where appropriate.

Chronic temporomandibular joint injuries

Head, neck and facial trauma does not always provoke an acute response. For example, some patients will report the onset of non-painful clicking in the TMJs after trauma and generally not seek treatment in the absence of pain or functional disability. The literature suggests that 90% of patients with non-painful clicking will not progress to joint locking or have pain with function. Thus, we tend to monitor these patients rather than intervene. Patients may also report

the development of momentary locking episodes following facial trauma, which implies a slightly higher level of joint dysfunction. Under these circumstances the risk is greater for the patient, in terms of potentially developing an acute closed lock. These patients require comprehensive assessment to determine all risk factors in order to try and establish what level of intervention is appropriate. In this case the provision of an intra-oral appliance for night-time use may be sufficient to stabilise joint function. Elimination of parafunction habits (use of chewing gum, keeping the teeth apart during the day, biting fingernails, etc.) may be equally important.

Muscle pain in the masticatory system is frequently associated with facial injury. The condition may be characterised by an unusual level of tenderness in the masticatory muscles, soft tissue swelling, redness of the overlying skin, muscle stiffness and pain with function.

The therapeutic approach should include:

- explanation and reassurance for the patient;
- a programme of habit avoidance;
- an exercise programme to stretch and/or strengthen the affected muscles;
- the application of hot or cold packs to minimise pain while exercising;
- analgesic regimens as needed;
- intra-oral appliances where bruxism is considered to be a contributing factor to the patient's pain and disability;
- stress management programmes where anxiety is a contributing factor; and,
- chronic pain medications where appropriate (in the presence of significant sleep disturbance, high anxiety levels, widespread body pain, etc.).

Nerve injuries to the temporomandibular joint

The development of neuropathic pain following injury to the orofacial region is a rare but serious condition. Clinically it presents as an area of persistent pain in the TMJ area, often against a background of normal joint function. It is an even greater diagnostic challenge when the symptomatic joint has obvious functional limitations. It may be difficult to differentiate between a classical functional disorder and neuropathic pain. However, the presence of neuropathic pain may explain why some patients do not appear to respond to appropriate therapies for TMJ dysfunction.

Treatment for neuropathic pain is based on the use of a selection of neuropathic pain medications, most of which have significant side effects. Nerve blocks and specialist pain control interventions may be required. For many patients with neuropathic pain the condition is incurable, although it may ease considerably over time.

References

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