

Treatment of habitual luxation of temporomandibular joint – literature review

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Abstract

Habitual luxation of the temporomandibular joint (TMJ) is a rare condition that can impede patient's living. Various procedures, both conservative and surgical, are used for the treatment of this disorder. Selecting the best treatment strategy can prove to be a difficult task for the clinician. The aim of this review was to present and compare various treatment methods dedicated to habitual luxation of TMJ. The available studies presented low level of evidence with incomparable study groups. However, some general conclusions in subject of habitual luxation of TMJ could be drawn: treatment should begin with conservative procedures and then, when needed, resort to surgical procedures; eminectomy can be considered the gold standard among surgical procedures. The subject of habitual TMJ luxation requires further studies with greater methodological rigour.

Key words:

joint dislocations,
temporomandibular
joint, treatment

Introduction

Habitual or spontaneous luxation of temporomandibular joint (TMJ) also named chronic recurrent dislocation of TMJ or open lock, concerns 3% of all luxations. [1] According to Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) from 2014 in this disorder patient's TMJ is locking or catching in wide open jaw position and the patient is unable to close the mouth without specific maneuver. [2] It occurs when the head of mandible moves anterior to the eminence of temporal bone. In this position the articular disc can be placed posterior or anterior to the head of mandible. For this condition to occur favorable conditions must be present – laxity of joint ligaments and narrow slopes of articular eminence. As the reason for this state authors mention occlusal and nonocclusal parafunctions, disorders of occlusion, decreased occlusal vertical dimension, mandibular and temporal congenital defects, injuries, connective tissue's defects, generalized ligaments' laxity, masseters and temporal muscles' debility. [3,4] Patient trying to close the mouth in a regular manner by activating masseters, medial pterygoid and temporal muscles is further blocking the TMJ in the anterior position. It is necessary for the patient to use special repositioning strategies, such as relaxation strategy or laterotrusion strategy. [5] If they fail, the manual reposition of TMJ is needed. Patients suffering from frequent luxations should undergo conservative or surgical treatment to prevent this disorder from recurring.

Conservative treatment

Parafunction control and correction of occlusion – are conducted using occlusal splints, prosthetics appliances, muscles exercises or selective teeth blasting. According to some authors main cause of habitual TMJ luxation are parafunctions. [3] This statement is supported by frequent appearance of teeth attrition on the contralateral side from the dislocated TMJ or bilateral when both TMJs are affected. Clinician should consider occlusal disorders and types

of parafunctions to choose correct treatment strategy for his/her patient. It is believed that occlusal disorders and parafunctions may be responsible for TMJ dislocation recurring after surgical treatment. The advantage of this treatment is minimal invasiveness with high efficiency (achieved complete recovery in 60% of patients and reduction of luxation frequency in 38,6%). The disadvantage is substantial decrease of efficiency proportionally to the time that passed between the first episode of dislocation and the beginning of treatment. [3]

Intermaxillary fixation (IMF) – usually placed for 4 to 6 weeks using arch bars and dental or interdental wiring which necessarily involves patient's teeth. [6] IMF causes miostatic contraction which limits jaw opening and therefore prevents TMJ luxation. This method is commonly used in combination with other restorative and surgical TMJ dislocations treatments. Disadvantages are obligatory change of diet during fixation, difficulties in maintaining oral hygiene and discomfort caused by significant restriction of jaw movements. Similar effects in edentulous patients can be procured using cervical collar. [7]

Autologous blood injection (ABI) – first time described by Brachmann is based on injecting blood previously obtained from patients to the TMJ superior synovial cavity and surrounding tissues. This procedure provokes first inflammation and after few hours or days fibrosis and ankylosis limiting TMJ movement. [8] It is indicated to perform in advance arthrocentesis. Efficiency of ABI varies depending on studies from 62,5% to 80%. [6,9] It is relatively easy and non-invasive treatment.

Botulinum toxin injection – is relatively simple and safe procedure. It is based on injecting botulinum toxin A into lateral pterygoid muscle resulting in temporary reduction of its activity. Therapeutic effect usually occurs 3-10 days after the injection. Contraindications are pregnancy, taking anticoagulants and some neurological diseases including *myasthenia gravis* or Eaton-Lambert syndrome. It is estimated that around 3-10% of population is resistant to botulinum toxin. [10] Efficiency of botulinum toxin injection exceeds even 90%. However, it is necessary to repeat injections after 3-6 months. [11]

Surgical treatment

Eminectomy – is one of the oldest procedures used for treatment of TMJ luxation described by Myrhaug. Operational access is created through the skin, anterior to the antilobium. Surgeon is obligated to be particularly vigilant as in this region many vital structures are located, including valid nerves, blood vessels and the upper part of parotid gland. The purpose of this surgery is to remove and flatten the eminence which allows the head of mandible to return from anterior boundary position without reduction in range of movement. It is necessary for the patient to follow a soft diet for 2 weeks after the operation and to start TMJ mobilisation exercises after the first week. Contraindications are pneumatisation and vascularisation of the eminence. High efficiency of this procedure is achieved both in treating unilateral and bilateral TMJ luxation. [12]

LeClerc blocking procedure – was invented by French surgeon in 1943. It is conducted with a similar operational access as eminectomy. The purpose of this operation is to form a block from the zygomatic arch anterior to the eminence preventing the head of the mandible from dislocating. [13] This procedure has many modifications.

Dautrey's procedure – was described in 1967. It is very much alike with LeClerc procedure. The difference is cutting zygomatic bone at a different angle which is supposed to grant better shape and fixation of block. [14]

Norman's procedure – is another blocking operation similar to LeClerc procedure. However, in this operation the block is created from the patient's bone acquired during procedure from for example iliac crest or cranial vault. It was described for the first time in 1984 and is still used with many modifications. [15,16]

Miniplate eminoplasty – is based on creating block from titanium miniplate attached to the zygomatic arch just superior to the eminence. It is the least invasive and fully reversible blocking procedure. Additionally, it does not require postoperative jaw movement restriction. Disadvantage is relatively high percent of miniplates breaking. Depending on studies it varies from 6,67% to 35% during 6 to 30 months. [17]

Arthroscopic eminoplasty – is much alike eminectomy but performed using arthroscopes. It is therefore less invasive and allows to shorten convalescence time after operation. However, it is more complicated procedure for the surgeon, requiring a lot of experience and manual skills. Additional problem is difficulty in assessing depth of eminence incision, which can result in perforation to the middle cranial fossa. [18] This procedure is supposed to be as effective as classical eminectomy. [19]

Arthroscopic cauterization of retrodiscal tissue/ TMJ capsule – is relatively low invasive procedure. It is supposed to cause contraction of the adequate ligaments through their electrothermal damaging. In this procedure are used cautery or laser achieving ligaments shorting for about 15% during one procedure. [20] Shorey at al. have stated that significant part of the open surgeries therapeutic effect is due to the postoperative TMJ ligaments contraction. [21]

Disc anchoring – is performed with an open surgical access using an orthodontic mini-screw which is being screwed into posterior surface of mandibular head. It is then attached to the articular disc using sutures preventing from anterior disc displacement. This procedure should be performed only in cases when TMJ luxation occurs with anterior disc displacement and then it is characterized by high efficiency. [22]

Treatment using Mitek anchors – allows to limit jaw opening range through binding first anchor placed in the lateral pole with second one placed in posterior root of the zygomatic arch. The main advantage of this solution is well-controlled and predictable restriction of jaw movement without interference in TMJ anatomy. [23]

Conclusions

Many methods of TMJ habitual dislocation treatment have been developed and described. However, studies dedicated to them do not meet the requirements for their proper comparison. [24, 25] Patients were recruited using different criteria also follow-up time wasn't unified. Moreover, analysed studies presented low level of evidence. It is impossible to clearly

indicate the best treatment procedure. However, these studies allow to draw conclusions for which the authors agree. It should be mentioned here that time which passed between TMJ luxation and its repositioning is essential. Reposition should be performed as soon as possible. Every day of delay makes the procedure more difficult and increases chance for complications. It is assumed that TMJ dislocation lasting over 4 weeks requires surgical intervention to resolve. [26,27] In treating habitual luxation time from first episode of TMJ luxation to the beginning of therapy is of the essence. Especially for the conservative treatment the more time has passed between first dislocation and the beginning of the therapy the less efficient the treatment will be, and the more side symptoms will occur. [3] The scientists do agree that treatment should start from restorative procedures like parafunctions elimination, intermaxillary fixation or periarticular injections and then resort to surgical procedures always trying to identify and eliminate the reason for this disorder. Also combining different treatment procedures can increase overall therapy efficiency, for example combining ABI with IMF. [6] While choosing proper treatment, clinicians should also take into account patient's local and general condition including patient's TMJ anatomy. Open surgical procedures should be avoided in elderly patients considering their lower healing capabilities. Also the older is the patient the lower are chances for graft integration resulting in higher frequency of complications. Considering surgical treatment, low-pitched articular eminence is treated best with eminectomy-like operations while steep eminence is indication for the blocking procedures. For the gold standard in surgical treatment of habitual TMJ luxation we can consider eminectomy as the vast majority of authors performed this procedure when the examined method failed. [24] Moreover, arthroscopic procedures seem to raise hopes due to their similar effectiveness with lower invasiveness as compared to the open surgeries. [18]

The subject of habitual TMJ luxation requires further studies with greater methodological rigour. Prospective studies with larger homogenous samples, adequate follow-up time and well-defined criteria

are needed in order to compare different treatment procedures.

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The results of the present study do not constitute endorsement of the product by the authors or the journal.

Conflict of interest

The authors declare that they have no conflict of interest.

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