

Clinical Study  
TMJ Disorders

# Arthroscopic cauterization of retrodiscal tissue as a successful minimal invasive therapy in habitual temporomandibular joint luxation

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**Abstract.** Habitual temporomandibular joint (TMJ) luxation is a serious condition for the patient, and is often managed by extensive open joint surgery. Arthroscopic eminoplasty is an alternative, but this technique could also cause concomitant damage to the articular surface. The aim of this study was to evaluate the therapeutic effects and side effects of arthroscopic electrocautery of retrodiscal tissues in habitual TMJ luxation. All patients with habitual TMJ luxations who needed surgical management from 1 January 2000 to 31 December 2009 in the authors' institution in The Netherlands, were included in this study. All patients were primarily treated with arthroscopic electrocautery. Pre- and postoperative evaluation parameters were: TMJ luxations, maximum mouth opening, translatory capacity, pain and joint noises. Sixteen patients with habitual luxation were treated with arthroscopic electrocautery. Patient reluxation occurred in one. None of the patients had joint pain or mobility restrictions. The overall success rate was 95%. After 86 months there was a high success rate for this therapy. No other morbidity was seen, in contrast with open joint surgery or using sclerosing agents. The authors conclude that arthroscopic electrocautery of retrodiscal tissues is a highly successful minimal invasive therapy in habitual TMJ luxation without side effects.

**Key words:** temporomandibular joint; luxation; arthroscopy.

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Luxation (syn. dislocation) of the temporomandibular joint (TMJ) is a rare but unpleasant and serious condition. In TMJ luxation there is complete dislocation of the disc–condyle complex, which means loss of contact between the joint surfaces. There is an acute displacement of the condyle anteriorly in front of the articular eminence and it becomes locked in front of it.<sup>1,2</sup> The origin of habitual luxation (syn. recurrent dislocation) of the TMJ is

thought to be related to three levels: joint architecture with a low and steep articular eminence<sup>3,4</sup>; the integrity of the joint capsule and ligaments; or the effect of jaw musculature on the joint.<sup>5,6</sup> Joint hypermobility or joint laxity is often found in these cases. The susceptibility to have TMJ luxations can also be constitutional. Other conditions for habitual luxation include traumatic factors, hereditary or acquired neurological illness and use of neuroleptic drugs, which may cause uncontrolled jaw movements as the result of tardive dyskinesia of the mouth opening muscles.<sup>7-9</sup>

The LeClerc procedure (LeClerc and Girard, 1943) was the first surgical method described for TMJ habitual luxation followed by discectomy (Dingman en Moorman 1951), eminectomy (Myrhaug, 1951), capsular rearrangement (MacFarlane, 1977), the closed condylotomy (Tasanen en Lamberg, 1978; Holmlund, 1991) and arthroscopic eminoplasty (Segami, 1999).

During the LeClerc procedure, an oblique osteotomy of the zygomatic arch is performed in a cranial area posterior to the caudal anterior direction in the region of the articular eminence, in order to block the condyle. Undt et al. have abandoned this technique, since they found a high rate of recurrence and a high incidence of postoperative clinical symptoms in the patient group they treated using the LeClerc procedure.<sup>10</sup> The eminectomy as described by Myrhaug in 1951, is designed to obtain a more 'normal' TMJ. In the eminectomy, the articular eminence is removed, to prevent the possibility that the condyle is trapped in front of it resulting in a luxation.<sup>4,11</sup> Eminectomy leads to intensive scarification of the upper joint space, resulting in a decreased translatory capacity of the disc-condyle complex.

Another method to treat habitual TMJ luxations is to perform a miniplate osteotomy, as described by Puelacher and Waldhart (1993). Kuttenger et al. treated 39 joints in 20 patients according to this method. The function of the miniplate is thought to stop the condyle.<sup>12</sup>

Sato et al. compared arthroscopic eminoplasty with conventional eminectomy according to Myrhaug in a group of 24 patients in order to approve treatment of habitual TMJ luxation with a minimal invasive technique.<sup>13,14</sup> From this study it was concluded that the two procedures produced the same quality of clinical outcome in terms of the recurrence rate of dislocation and risk of complications.<sup>13</sup> However, arthroscopic eminoplasty causes serious damage to the articulating

surface, and consequently adherence or anchoring of the articular disc is thought to be the final result of the reduced joint mobility procedure.

Only a few of the described treatment modalities are based on surgery of the ligaments. Onishi, who can be considered as the pioneer in TMJ arthroscopic surgery, applied arthroscopic laser surgery with neodymium: a YAG laser in the oblique protuberance area in order to obtain scarification of the retrodiscal tissues.<sup>15</sup> The same goal was achieved by Merrill who performed arthroscopic sclerosis of the oblique protuberance in the 1980s by injecting sclerosing agents under direct vision.<sup>16</sup>

According to previous study findings the authors assume that effective treatment of habitual TMJ luxation is mainly due to a local scarification in the upper joint space than due to the surgical reshaping of the upper joint compartment by reduction of the articular eminence. Their assumption is that a minimal alteration of the TMJ ligaments is already effective, without excessive damage to the upper joint space. Cauterization may induce fibrosis and scarification of the exposed tissues and therefore electrocautery is probably an effective arthroscopic surgery tool in the management of TMJ habitual luxation. The aim of the present study was to evaluate the therapeutic effect of arthroscopic electrocautery of the TMJ retrodiscal tissues in patients with habitual TMJ luxation.<sup>17</sup>

## Materials and methods

To select the patients for this retrospective study, all medical charts of patients who visited the emergency department or the department of oral and maxillofacial surgery of the University Medical Center Groningen, The Netherlands, from 1 January 2000 to 31 December 2009 with a TMJ luxation were reviewed. All patients who underwent arthroscopic surgery of the TMJ with arthroscopic cauterization of the retrodiscal tissue for habitual TMJ luxations were included in this study. Patients who were treated with neuroleptic drugs were excluded from the study. As part of the treatment protocol a standard follow-up evaluation after 6 months was scheduled. If no relaxation or other complaints were observed or reported at follow-up, patients were discharged from regular follow-up and received instructions to contact the department if relaxation occurred. All patients were scheduled for a standardized follow-up as described up to 6 months after surgery. Six months

was chosen as the standardized follow-up period because the results of the patients the authors treated during the first 5 years of this study have shown that no relaxation of the TMJ seemed to occur after the 6 month period. Moreover, all patients were followed for a longer period of time (from date of treatment up to the end of the study), but as many patients did not live near the treatment unit, this was not carried out according to a standardized recall protocol.

The following parameters were evaluated preoperatively: frequency of TMJ luxations; presence of movement disturbances of the TMJ; jaw translation capacity; pain and/or clicking of the TMJ; the ability to self-reduce TMJ luxation; and the preoperative maximum mouth opening. The following parameters were evaluated 6 months postoperatively: postoperative pain assessment by evaluating if there was any difference compared to the preoperative situation; jaw movement disturbances; joint noises; maximum mouth opening; and post-therapy TMJ luxations. Additionally, all patients received a telephone call in May 2012. They were asked if any relaxations had occurred after the treatment and if there was any impairment in jaw function and mobility, or if they had pain. Their impairments were assessed by means of the mandibular function impairment questionnaire (MFIQ).<sup>18</sup>

To evaluate outcome, the arthroscopic treatment of habitual TMJ luxation by electrocautery of the retrodiscal tissues was marked as a success if no relaxations of the treated joint occurred during the first 6 months after surgery without joint pain and no translation restrictions. Furthermore the patients had to be free from relaxations during the period from treatment up to the last telephone consultation. A Student's *t* test was used for statistical analysis of pre- and postoperative maximum mouth opening.

## Operative technique

All patients were operated on by the same surgeons (de Bont LGM, Spijkervet FKL). The arthroscopic surgery was performed in a day-surgery setting under general anaesthesia using the double puncture technique, as described by McCain.<sup>17</sup> Subsequently the retrodiscal tissues were scarred by means of extensive bipolar electrocautery (Lorenz-Biomet bipolar 1.7 mm diameter cautery). After the procedure, 0.5 cc 40 mg/ml methylprednisolone was injected into the retrodiscal tissues under direct arthroscopic view.

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