



Prima Books
Jan Tunér
Spjutvägen 11
772 32 Grängesberg
Sweden
Fax +46 240 23037

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Some of the text on TMJ from this book

Temporo-mandibular disorders (TMD)

Lasers can be of benefit in various ways for problems relating to temporo-mandibular disorders. As with any treatment, a correct diagnosis is essential to obtain a satisfactory result. In a number of conditions, the pain itself prevents conventional treatment, such as occlusal adjustment and taking impressions for a splint. By irradiating the joint and tender points, pain relief can be achieved, musculature is relaxed, and treatment can begin. In cases of trismus [293], tender points and muscle attachments are treated - 3-4 J per point is usually a good start. Make a note of the maximum jaw-opening ability before treatment starts, then measure it again afterwards. During subsequent treatment, even more peripheral muscle attachments (e.g. the sternocleidomastoid) are palpated and treated. The treatment should not be discontinued as soon as pain disappears, but should be continued at longer intervals. Two to three treatments in the first week, then once a week, can be sufficient for myofascial pain. If a pain reaction occurs, wait a few days, then begin again with a lower dosage.

Additional irradiation of the stellate ganglion [691] [692] [685] in pain patients has been effective in several studies and can be recommended for TMD treatment as well.

Laser light has an effect on arthrosis as well as arthritis, which makes it a useful complement to the conventional treatment of TMD. Arthrosis requires larger doses than arthritis. In most instances, LLLT is almost as effective as intra-articular steroids for joint pain.

The inter-relation between TMD and tinnitus has been addressed by i.e. Myrhaug [711]. The influence of n. trigeminus and n. facialis in TMD is well recognized by dentists. These two nerves also govern m. tensor tympani and m. stapedius, respectively. Treating the TMD could therefore also influence these two muscles in the middle ear. Reducing the tones of the masticatory muscles would also relax the two middle ear muscles.

Low power laser therapy of "Costen's syndrome" is reported to have a significant influence on the regression of pain symptoms in a study by Grzesiak-Janias [820]. Laser therapy was followed by prosthetic treatment in the form of overdentures.

Literature:

Hansson [85] studied the effects of GaAs on arthritis of the temporomandibular joint. He stresses that lasers are not an alternative to conventional treatment, but that it seems possible to reduce healing periods and more quickly reduce inflammation.

Bezuur and Hansson [206] treated a group of 27 patients suffering from long-term problems related to TMJ (temporo-mandibular joint) disorders with a GaAs laser. The treatment was administered over the joint on five consecutive days. 80% of the 15 patients with arthrogenous pain experienced total pain relief. The maximum jaw-opening ability increased during the treatment period, and continued to increase during the year that the group was monitored. The group suffering from myogenic problems also improved, both in terms of pain and jaw-opening ability. The effect here was, however, much lower. As the muscles were not treated, it is assumed that this group also had undiagnosed arthritis. The reduction of joint sounds may possibly have been due to an increase of metabolism in articular cell structures, e.g. an activation of the synovial membrane, producing more synovial fluid.

Eckerdal [595] reports on the clinical experience of a 5-year noncontrolled study of perioralneurapathias. The treated diagnoses were trigeminal neuralgia, atypical facial pain, paresthesias, and TMD pain. Of these diagnoses, the TMD pain group was the most successful one. At the end of treatment, 73% of the patients (N = 40) had a good response, at six months still 73%, and at one year 70%. 10 J/cm² was applied to the joint over 4-8 sessions.

In a study comprising 75 cases, Bradley [435] found LLLT effective as a monotherapy when treating acute joint pain (less than eight weeks duration). In more chronic cases, without bone changes on X-ray, LLLT was used as an adjunct to splints and the like. In osteoarthritis cases, LLLT can be almost as useful as intra-articular steroids.

Bradley [117] used GaAs laser acupuncture when treating a small group of patients suffering from TMJ pain dysfunction syndrome who had not responded to treatment with a bite splint or psychotropic medicine. Needle acupuncture was used in a comparative group. Both types of acupuncture can be studied with thermography. Biostimulation was observed to yield vascular effects which locally resemble the vascular effects achieved with needle acupuncture, although it takes more time for laser stimulation to take effect. Both forms of acupuncture were more effective on known acupuncture points than on randomly chosen points. St 6 was used throughout as a "known acupuncture point".

Kim [177] divided a group of 36 patients with maxillary joint problems into three therapy groups. The patients were treated with bite splints, GaAlAs laser treatment, or laser acupuncture. The treatment results were compared after two and four weeks with a check on status before treatment. The following conclusions were drawn. The patients' subjective discomfort was reduced in both the bite splint and laser treatment groups. The improvement in the laser group was much greater than in the bite splint group. Clinically observable symptoms showed a significant reduction in all groups, but the group treated with laser light responded faster to treatment than the other groups. EMG

(electromyogram) activity gradually decreased in all the groups - and without any great difference between groups. Laser treatment had more beneficial effects than bite splints, while laser acupuncture produced the poorest results.

Lopez [244] treated a group of 168 patients with problems related to TMJ disorders with a combination of bite splints and HeNe laser light. An obvious improvement could be observed in 52 of the patients after a single treatment. After ten treatments, 90% of the patients had improved. No further improvement was brought about in the other 10% by administering further treatments. The laser treatment was given directly over the maxillary joint - 6 mW for five minutes. The extent of healing was inspected using a tomographic X-ray before treatment and after six months. At that point, healing had advanced to a stage usually seen after 12 to 18 months when only a bite splint is used. In a group of 88 patients with pains in the jaw muscles, pain was alleviated for up to six hours, but without lasting results. The author concluded that HeNe lasers are effective as a complementary method to bite splints when treating arthrosis and arthritis, but that this wavelength is not optimum for myogenic pain.

Frugoni [342] also used X-rays to confirm the recovery rate in patients affected by calcification problems, using GaAs and HeNe lasers. In this particular study, the shoulder joint was studied.

Hatano [49] used a GaAlAs laser to study the effect on palpation pain in 15 patients with TMJ problems. A 30 mW laser was used for 3 minutes in the area of one temporomandibular joint. The other side served as control. Palpation score was estimated directly after irradiation and at 20, 40, and 60 minutes after irradiation. There was a significant decrease in palpation pain with better values at 20, 40, and 60 minutes than directly after irradiation.

Bertolucci [532] compared two groups of patients (16+16) receiving physical therapy for mandibular dysfunction. One group received sham irradiation, the other GaAs during three weeks. The results were as follows (treatment group/placebo group): change in pain 40.2s/1.56; change in vertical opening 1.35/-0.05; change in left and right deviation 3.78/0.62.

Interleukin-1p in the synovial fluid is associated with TMD pain [639]. In a study by Shimizu [370], GaAlAs laser light influenced the production of this substance.

Ivanov [310] treated 109 patients with temporomandibular joint arthritis and arthrosis with an HeNe laser (12 mJ/cm², 3-7 treatments). 89% of the patients reported clinical improvement.

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