

Twenty Years' Experience in Treating Hypermobility of the Temporomandibular Joints*

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THE temporomandibular joint is unique, the only articulation of its type in the body. Its peculiarities are as follows: (1) Bones carrying great stress or strain are built in proportion to handle the load, such as the knee or ankle joint. The temporomandibular joint, however, is different, even though the jaw exerts up to 500 pounds of pressure per square inch. The body of the mandible is heavy and this stands the crushing strength, but the neck and head of the condyle are light; this shows that these great forces must be muscularly balanced and the temporomandibular joint does not take the major stress and strain. It is merely a guiding member to perfect articulation. (2) It is one of twin joints located at either end of a horseshoe-shaped bone, the mandible. (3) Its peculiar construction permits more free motion in all directions than is found in other joints. (4) Both joints move through a similar pathway when in motion. (5) Either one or both condyles may be removed and good function retained. (6) One or both condyles may be fractured and healing permitted with the condyle in almost any position, yet the resulting function will be practically normal and (7) the condyles are rather loosely suspended in their sockets.

Hypermobility of the temporomandibular joints is characterized by an excessive mobility in which the temporomandibular joints luxate or subluxate. Luxation of the temporomandibular joint is its complete dislocation, whereas

subluxation means a partial dislocation of the mandible.

ETIOLOGY

The most common causes of luxation and subluxation are birth injuries, congenital weakness of ligaments of the temporomandibular joint, injudicious use of mouth gags, yawning, long dental sittings, extraction of teeth, manipulation of the patient's jaw while under general anesthesia, singing, sleeping with the head resting on the arm and a variety of accidents, as well as psychotic patients forming bad habits in movements of the mandible.

SYMPTOMS

Hypermobility is an all-inclusive term, meaning more motion than normal and occurring in both forms of dislocation, complete and incomplete. It can be seen or felt easily by palpation. When the mouth is opened the head of the condyle passes downward and forward through the normal pathway, continues on, overrides the eminentia articularis and passes out in front and above this structure.

Pain may be constant or intermittent. It is usually localized in the region of the ear on either or both sides. As a rule, the pain is unilateral and occurs when the joint is used. It may be referred to other parts of the head on the same side, for example, the temple, cheek, mastoid, occiput or neck.

Clicking or grating is frequently present during one or all three phases: opening, closing and exertion of pressure, as when the patient is chewing. In complete dislocation, the mouth is opened and cannot be closed by the patient;

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both sockets are empty and the displaced condyles may be perceived visibly and also by palpation.

Locking of the jaws may occur when they are opened in luxation or subluxation. The meniscus or fibrocartilaginous disc is usually responsible for this condition. In such instances it is caught and folded between the head of the condyle and the eminentia articularis. In luxation, locking occurs only when the jaw is open.

Mental complex is a condition seen frequently in this disorder. The dread of having the jaw dislocated, with locking or extreme pain, or both, induces a phobia in these persons. Marked improvement and complete cure are shown very often as treatment progresses.

DIAGNOSIS

One of the most valuable aids in the diagnosis of these dislocations is palpation of the joint. The tips of the index fingers are placed over the temporomandibular joints just anterior to the tragus of each ear and the patient is instructed to open and close the mouth. Gentle palpation will reveal the following: (1) the joint involved and whether one or both sides are affected, or if both sides are normal; (2) the extent of subluxation of one or both sides; (3) tenderness over this region when the joint is moved or at rest; (4) grating, popping or clicking; (5) occurrence of click on opening, closing or pressure; and (6) determination of effectiveness of treatment in both joints.

Hypermobility is diagnosed easily. The symptoms, as enumerated, are characteristic and the accompanying history reveals the duration of the trouble, its progress, the side involved and any other factors relevant to it. The indications for treatment are as previously given: pain (local, constant or when the joint is moved), clicking or grating; complete dislocation; locking of the jaw in either the opened or closed position; and dolorophobia. A hypermobile temporomandibular joint on one side may produce pain on the opposite side due to the twisting instead of sliding action.

CONTRAINDICATIONS FOR TREATMENT

Unfinished dental work should be completed before the joint or joints are treated. Professional singers do not want their mouths limited in opening.

A patient who is ready for treatment may appear at the appointed time with limited motion and pain in the joint. Very likely an acute sprain has occurred, tearing the capsule and blood vessels and stretching the ligaments. This joint should not be treated at this time. Limitation of motion is nature's splint, as is observed in all acute injuries to the joints. The treatment for this condition is rest. If acute symptoms disappear in a few days or weeks and hypermobility and pain follow, the joint should be treated. Injection of the temporomandibular joint is contraindicated if both articular surfaces, that is, the head of the condyle and the glenoid fossa, are rough, painful and limited in motion and if there is no clicking or grating. Hydrocortone® is the drug of choice in trying to affect a cure.

TREATMENT

If there is doubt that an afflicted joint should be treated and the decision depends on whether or not the pain is coming from the joint, it is permissible to inject procaine hydrochloride into the joint to allay the pain. If effective, treatment should be started or the jaw may be supported by a bandage for several days to determine if this will eliminate the pain. If it does, the joint should be treated. It is recommended that dolorophobic patients be treated by wiring the jaws shut and injecting them two or three times at two-week intervals, leaving the jaws thus secured, if the phobia clears, for several weeks or months.

Unilateral subluxation, as a rule, should be treated bilaterally, a little more emphasis being placed on the hypermobile side. A normal joint, the complement of which is hypermobile, will frequently become similarly affected and clicking, pain or even locking may occur on both sides. Normal motion of one joint and hypermobility of the other requires treatment of the hypermobile joint only.

The following drugs are recommended for this treatment: intracaine,® 5 per cent in oil (B-diethylaminoethyl pethoxy benzoate, Squibb); eucupin,® 1 per cent in oil (isoamylhydroprene, White; this solution must be prepared specially), and synasol® (sodium psylliate), a 5 per cent solution of the sodium salts of fatty acids extracted from psyllium seed with benzyl alcohol, 2 per cent (Searle). This latter drug is considered the most effective of the group in bringing about a cure.

Hypermobility of the Temporomandibular Joints

However, because of its tendency to cause discomfort in some instances, a search is still being made for a completely painless method of treatment.

Injection of intracaine, 5 per cent in oil, or eucupin, 1 per cent in oil, is painless. The fibrous tissue produced by these two drugs is not as firm as that obtained by the use of sodium psylliate. However, it is adequate and a good result is usually obtained in the average patient. Synasol may always be relied upon when the other two drugs fail. Intracaine and eucupin in oil are resorted to as a slower approach to normal function. The absolute control to a fine degree is more readily accomplished with these two drugs.

Various types of treatment used in the past and still employed by some operators appear to be unsatisfactory. Surgery is one. Among its disadvantages and dangers are resultant scars and the rather great physical difficulties encountered in removing the cartilaginous disc. Scarcely less formidable is the placing of mattress sutures in the capsule. Other complications are possible, including facial paralysis on the side involved or a permanent salivary fistula if the parotid gland is injured. The proximity of the external maxillary artery and veins adds to the hazards and ankylosis may result, caused particularly by infection incident to the operation. The loss of vertical dimension and disturbance to the occlusion cause a marked discomfort that many patients complain of bitterly. The removal of the head of the condyle for the average hypermobile, clicking, painful temporomandibular joint is not to be considered.

A review of some methods of treatment in use shows a modicum of good in all although most are quite unsatisfactory. One such method commonly used consists of putting a bandage around the head to immobilize the mandible with the superior maxilla for a period of one and a half to two years. The patient is instructed not to open his mouth for large morsels of food but to keep the joint at rest as much as possible. If a click should recur, treatment is repeated for another one and a half to two years, together with bandaging to control motion.

The treatment recommended consists of putting 8 drops of a sclerosing agent into the cavities of each joint. This tightens the capsules. To facilitate accuracy a 1 cc. tuberculin

syringe is filled with the solution to be injected and a 26 gage needle $1\frac{1}{2}$ inches long is adjusted. The skin over the joint is rubbed briskly with an alcohol sponge and the tip of the index finger of the left hand is dipped in alcohol and used to palpate the structures over the joint. The patient is then asked to open and close the mouth several times until the head of the condyle leaves the glenoid fossa and can be visualized clearly by the operator. The injection is made in a downward, forward and inward direction until the tip of the needle strikes the head of the condyle. The point of the needle is withdrawn slightly and the syringe and needle are moved to a more or less right angle to the head and inserted about 2 to 3 cm. deep posterior to the head of the condyle into the joint proper. A gentle pull on the piston will bring blood into the syringe if the needle is in a blood vessel. If so, the needle should be withdrawn a short distance, reinserted in another direction and the test repeated. It is important that this test be made to prevent the oily drug from entering a blood vessel. Four to eight drops of intracaine are injected. The injection is repeated on the opposite side.

Injection is made again in two or three weeks and is repeated until sufficient fibrous tissue has developed to effect a cure, which is determined by the limitation of the aperture between the upper and lower teeth when the jaw is opened fully. Some patients will require only one injection. In others, as many as four to six may be necessary. The second or third injection is much more difficult to make because the head of the condyle now is in close apposition to the glenoid fossa and does not leave it when the mouth is opened. Patients suffering most from pain, subluxation and clicking usually obtain the best results, as do patients who experience the greatest degree of local reaction after injection.

POSTOPERATIVE SEQUELA

The injection itself should produce no more discomfort than the prick of the needle followed by a slight feeling of numbness and fullness in the joint. In the majority of cases the patient has no complaint other than some interference with chewing for the remainder of the day on which he receives the injection. The administration of 10 gr. of aspirin occasionally may be necessary for comfort. The injection may produce a slight feeling of numb-

ness of the side of the face owing to the anesthetic action of the oily solution.

In order to avoid alarm, the patient should be cautioned that the lower jaw will be locked, in all probability, by the following morning. He should be advised that this is a desired state and that the jaw should remain so as long as it will. This insures a more perfect end result. He should be cautioned not to yawn or open the mouth wide enough to cause pain and to apply a bandage before going to sleep to prevent excessive opening of the mouth at night.

There may be swelling in the region of the injection which usually lasts three or four days. The bite may be shifted temporarily slightly forward or to one side, depending on the degree of the reaction. The molar teeth may not come into occlusion because of thickening of the capsule. This effect is also transitory. Very rarely there may be salivation for twenty-four to forty-eight hours and some pain if the injection was made too deeply, depositing the solution at the inner table of bone and affecting the chorda tympani. At times the anesthetic agent will contact the seventh nerve and this will produce a mask-like expression on one side of the face which can cause some anxiety on the part of the patient. When this anesthesia of the seventh nerve is explained to the patient and he is told it will last for two or three hours and then return to normal, all his fears are allayed.

The following five factors may account for failure of this treatment: (1) Injection made in the skin surface anterior to the tragus of the ear traversing deep into the external auditory canal will result in failure. (2) There is a very thin membrane between the temporomandibular joint and the middle ear, and depositing the solution in the middle ear will not be successful. (3) Injecting the solution into a large blood vessel will also result in failure. (4) Injection of the periarticular spaces will also fail. (5) Allowing a patient to yawn or to produce pain by forcibly opening his mouth, as in eating after an injection, will tend to destroy the effectiveness of the treatment and should not be permitted.

A temporomandibular joint that is painful on motion and limited in movement, and which roentgenographically shows a roughened area usually on the anterior portion of the head of the condyle and on the eminentia articularis, is one that should be treated in a manner that will limit motion still further and separate the denuded or roughened areas. In order to aid

nature in limiting pain and to promote healing, this restricted limitation should be controlled for a period before allowing the joint to resume its normal excursion, and then only after roentgenograms have shown healing of the roughened surfaces. Painful roughened joints that affect both condyle and glenoid fossa in their entirety, that are limited in motion and are becoming progressively worse may be treated by this method or injection of hydrocortisone. Some of these joints have returned to normal, a few having to be treated surgically.

The constant irritation produced in a hypermobile joint will cause folding and breaking of the fibrocartilaginous disk and certain types of tumors may develop. The most common types are sarcomas, osteomas, chondromas and myxochondromas.

The type of treatment described herein permits the operator perfect control of the desirable degree of function and fibrosis. This control is directly proportional to the number of injections given and the quantity of solution injected. The limitation of opening is carried to a degree just sufficient to stop the clicking, grating or subluxation and is held there. Usually one treatment is sufficient with a cooperative patient; two, three or four treatments may and should be given if necessary. The limitation of motion, should a difficult patient object too strenuously, may be overcome by administering a small amount of nitrous oxide and opening the patient's mouth with a mouth gag.

The clicking, grating or popping has been controlled thus far in all of the several hundreds of patients who have been under my care. This control is attained usually during the first six to twenty-four hours. To date there has been no complication or deleterious effect.

CONCLUSIONS

This subject has again been presented with additions and corrections to give the profession a clearer conception of the treatment described and its progress, soundness and efficacy. This condition was the basis of a previously published article, but because several thousand patients have been treated to date this report is more valuable in proportion to the larger experience gained.

Attention is directed again to the simplicity and safety of the method and to the fact that it may be used in the treatment of other joints in which function is impaired by lax ligaments.