

THE TREATMENT OF TEMPOROMANDIBULAR JOINT SYNDROME THROUGH CONTROL OF ANXIETY

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Summary—Following a negative experience with general anesthesia, a 20-yr-old woman developed anxiety and an inability to relax concomitant with temporomandibular joint dysfunction and pain syndrome. Systematic countering of anxiety by relaxation successfully removed her anxiety and led to a complete resolution of her symptoms. Follow-up at 16 months indicated maintenance of treatment gains and no recurrence of the symptoms during the previous 12 months.

An individual's emergence from general anesthesia is frequently associated with states of excitement, delirium, headaches, nausea, unpleasant dreams and anxiety (e.g. Dripps, Eckenhoff and Vandam, 1982; Hewer, 1970; Tschirren, 1980). Various factors such as pain, pre-operative fear and anxiety, resistance to anesthesia, and hypoxia have been posited to explain these events. Regardless of the specific precipitating factor, however, it is generally believed that these effects are transitory.

Although the experience of hypnosis has typically been described as a pleasant experience by student volunteers (e.g. Coe and Ryken, 1979), occasional unpleasant after-effects have been reported. Hilgard, Hilgard and Newman (1961) found that 10 out of 26 (38%) college student subjects who reported sequelae to hypnosis (e.g. drowsiness, confusion, headache, stiffness, dizziness) had previously experienced unusual reactions to anesthesia. However, only 5 out of 99 (5%) subjects, having had no unusual reactions to anesthesia, reported any sequelae. Hilgard (1974) found a similar but nonsignificant trend in a replication study, and Orne (1965) also reported such a trend but did not provide any data.

One explanation proposed for the relationship between the sequelae of hypnosis and those

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of general anesthesia is that the hypnotic situation re-integrates the experiences associated with general anesthesia (Hilgard, Hilgard and Newman, 1961). That is, the hypnotic situation provides cues similar to those found in the anesthetic situation, such as counting down, the expectation of loss of control, references to sleep, and so on. These cues then lead to the re-experiencing of unpleasant side-effects and affect associated with general anesthesia.

If the unpleasant after-effects of general anesthesia can be re-experienced in a few individuals following a hypnotic induction procedure, then these effects may also occur following other experiences involving relaxation and the focussing of attention on somatic functions. The present case report describes (a) the long-term effects of an unpleasant experience with general anesthesia in a young woman and (b) the treatment of this woman's severe post-anesthetic anxiety.

CASE HISTORY

A 20-yr-old woman was referred to the Department of Oral Medicine at the University of Western Ontario with facial pain. Her presenting symptomatology was of (a) pain and

tenderness of the muscles of mastication, (b) sounds during condylar movements, mainly clicking, and (c) limitations of mandibular movements. Radiographs showed no changes or organic disease of either temporomandibular joint. She was therefore diagnosed as having temporomandibular joint dysfunction and pain syndrome (TMJDPS).^{*} This syndrome is generally associated with spasm in the muscles of mastication as a result of physical and/or psychological stressors (e.g. Brooke and Stenn, 1983; Brooke, Stenn and Mothersill, 1977; Dubner, Sessle and Storey, 1978; Moss, Garrett and Chiodo, 1982). High levels of stress have been reported by the majority of such patients and consequently, behavioral-relaxation therapies have been used to treat this syndrome with occasional success (see Moss, Garrett and Chiodo, 1982; Scott and Gregg, 1980; for reviews).

As part of an ongoing treatment evaluation of hypnotherapy and relaxation training programs for these patients, this woman was seen for an initial evaluation session. During the session, she completed baseline measures for the intensity of her symptoms on visual analog scales as described below. She was also tested for hypnotic susceptibility on the Carleton University Responsiveness to Suggestion Scale (Spanos *et al.*, 1983), a standardized hypnotic susceptibility scale.

Following susceptibility testing the client reported sequelae to hypnosis. She was interviewed immediately afterwards and indicated she had experienced dizziness and nausea, that she had felt "the room closing in on her" and that she had felt "suffocated", as if her "body was strangling" her. She described that these sensations were similar to those she had experienced exactly 1 yr earlier after oral surgery for the extraction of impacted third molars. At that time, prior to losing consciousness with a general anesthetic, she had received a muscle

relaxant and then felt the clamp being placed in her mouth. She attempted to resist and, being unable to move any of her limbs, panicked believing that "this is the end".[†]

Upon regaining consciousness she reported being surprised that she was still alive. Her father-in-law, an M.D. who was present in the recovery room, said to her "all your teeth are out—April fools!" (It was 1 April.) For months following, she had recurrent nightmares in which her father-in-law's face was contorted and repeated over and over "all your teeth are out—April Fools". Subsequently, she reported being unable to relax. She stated that as soon as she began to relax, she felt "anxiety come over" her, her hands and back would begin to sweat, and she would literally have to place her feet solidly on the floor. She also developed severe nocturnal bruxism, another stress-related disorder (Morse, 1982). Her temporomandibular joint dysfunction and pain syndrome developed shortly after her operation and the symptoms steadily increased in severity. Ten months following her operation she sought treatment for her facial pain. Other than her experience with the general anesthetic she reported that, during this period in her life, nothing unusually stressful or disrupting had occurred, or was presently occurring.

We hypothesized that the client's inability to relax or her fear of relaxation had manifested itself in bruxism and a spasm in the muscles of mastication which had produced the symptoms of pain, sounds, and limitations of mandibular movement. Since the exact time of onset of bruxism was not known, however, it is not clear whether it preceded or co-occurred with the joint dysfunction and pain syndrome.

PROCEDURE

Since the client's symptoms appeared to result from her inability to relax, she was given

^{*}TMJDPS is the name proposed for this syndrome by the subcommittee on taxonomy of the International Association for the Study of Pain. It has previously been referred to as myofascial pain dysfunction syndrome (see Moss, Garrett and Chiodo, 1982).

[†]Muscle relaxants given in the absence of general anesthetics can create extreme states of fear or panic (e.g. Campbell, Sanderson and Lavery, 1964).

four sessions of anxiety countering in a modification of "anxiety management training" (Suinn, 1975). Consequently, reduction of her joint dysfunction and pain symptoms, and not only the verbal report of reduced anxiety, was considered critical in determining treatment efficacy.

Four weekly sessions were developed to enable the client to gain control over her anxiety. As in anxiety management training, each session began with Jacobson's standard progressive relaxation procedure (Jacobson, 1938). Then the client was instructed to visualize a relaxing scene with the aid of guided rehearsal. Several detailed descriptions were obtained of actual situations which were relaxing for the client (e.g. lying on a beach on a hot summer day). The therapist instructed the client to visualize one of these scenes in each session and, through verbal descriptions of the scene, enabled her vividly to re-experience these events. Ordinarily, the visualization of anxiety provoking scenes is included here in an anxiety management training program. This was not done, however, because relaxation itself was anxiety provoking.

Successive sessions were aimed at allowing the client to experience control over her anxiety by continuing the progressive relaxation procedure to where she began to feel herself becoming anxious. Instead of panicking, however, she was instructed to return to the point at which the anxiety dissipated. That is, when she became aware of signs of anxiety, such as clenching of the fists or shoulder tightening, she would open her eyes, and if necessary, sit up from her reclining position until the anxiety had receded. The therapist would then wait until the client stated she was free from anxiety before proceeding. The next phase consisted of having her initiate and terminate her anxiety reactions with little or no direct instruction from the therapist. Finally, she was given "homework" to control her anxiety outside the therapy sessions, especially at night prior to falling asleep. This latter time had proven particularly troublesome prior to treat-

ment. It was clear by the fourth session that the client had learned to control her anxiety, and treatment was terminated.

During the baseline session and at the beginning of each treatment session the client rated her temporomandibular joint dysfunction and pain syndrome symptoms on three visual analog scales. Each of the three principal symptoms (i.e. pain, sounds and limitation of movement) were rated on separate scales. The visual analog scales consisted of a 140 mm line which the client marked to indicate the extent of the presence of each of the three symptoms. The maximum width of mouth-opening was measured in millimeters with a caliper prior to each session. To examine maximum pain fluctuations, the client rated her pain at home three times a day (once in the morning, mid-day and evening) on a visual analog scale bounded by the phrases "no pain" and "most intense pain imaginable". These ratings were made only for the 4 weeks of treatment and were reduced by taking the maximum pain rating for each day of the week and dividing it by seven. The resulting weekly scores were labelled "peak pain" scores.

RESULTS AND DISCUSSION

The subjectively rated joint dysfunction and pain syndrome symptoms decreased with treatment as shown in Fig. 1. By Session 3, all of the pre-session ratings had dropped to zero. By the fourth session, peak pain dropped to zero, coinciding with the client's reports of having learned to control her anxiety. The client's maximum jaw opening increased over the four sessions from an initial value of 27 mm to 30, 35 and to 45 mm (full), respectively. She reported being able to relax without fear of being overwhelmed by "waves of anxiety" and was certain that the treatment had been responsible for this outcome.

At 2 weeks following treatment the client was re-examined by the dental surgeon. She reported some sounds (see Fig. 1) but no pain

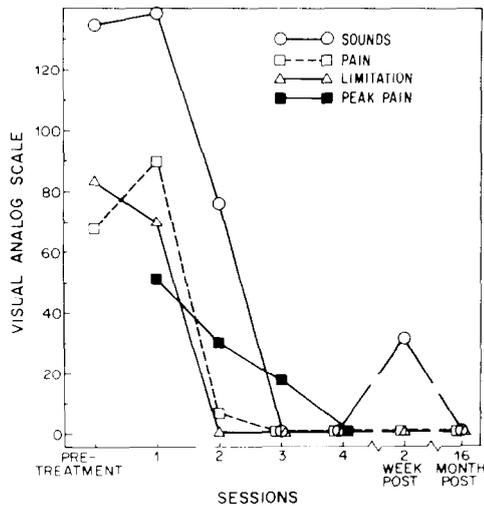


Fig. 1. Ratings of sounds, pain, and limitations of opening, rated on a 140 mm visual analog scale, are plotted from pretreatment to 16 months posttreatment, and ratings of peak pain (140 mm VAS) are plotted for the four weeks of treatment.

or limitation in movement. She also reported no return of her anxiety. At 16 months she reported being completely symptom-free and stated that she had been so for more than a year.

The immediate improvement and subsequent disappearance of the temporomandibular joint dysfunction and pain syndrome symptoms following the elimination of anxiety was unexpected. It supports the notion that the client's symptoms were at the least exacerbated by stress and anxiety (Brooke, Stenn and Mothersill, 1977; Moss, Garrett and Chiodo, 1982). It also demonstrates the utility of our relaxation training program for the brief therapy of anxiety. Furthermore, these abrupt changes following treatment likely rule out history and maturation as threats to internal validity (Kazdin, 1981).

One limitation of this case, however, is the lack of assessment of nocturnal bruxism. Despite the impression of its alleviation by the client, it is obviously difficult to assess by verbal report alone. Although bruxism and temporomandibular joint dysfunction and pain

syndrome are both stress related, it is not clear how the presence of one might influence the other (Morse, 1982).

If the present case is representative, it is quite possible that general anesthesia may occasionally lead to after-effects that do not immediately dissipate. This is also evidenced by those reports linking sequelae to hypnosis with unpleasant experiences following general anesthesia, although further research is sorely needed. In the same vein, however, these effects may, at least in some cases, be relatively simple to treat.

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