

Responses to Conservative Treatment in Temporomandibular Disorders with Locking Versus with Muscle Pain

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ABSTRACT: We conducted a follow-up study of 150 patients with temporomandibular disorders, of whom 91 had muscle pain and 59 locking, in order to investigate the response to conservative treatment. The patients with muscle pain showed fairly uniform age distribution, while the percentage over 49 years of age was lower in those with locking. Of the patients with TMJ locking, the percentage who completed treatment was high, and the duration of treatment in this group was longer than that in those with muscle pain. The differences between these patient groups in the response to conservative treatment may be useful in the assessment of individual patients with temporomandibular disorders. Moreover, the greater incidence of completion of conservative treatment in the patients with locking indicates that these patients should be treated by conservative treatment prior to surgical treatment.

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Patients with temporomandibular disorders show various symptoms, including joint pain, muscle pain, impaired movement, clicking and various combinations of these symptoms. Because of these common features, an examination to provide baseline data for comparative evaluations can be performed (Fain and McKinney 1985).¹ After which, treatment is generally performed according to the clinical symptoms.

However, there have been cases reported in which the clinical symptoms did not conform to examination findings, i.e., the observation of temporomandibular joint (TMJ) disk displacement on roentgenographic or MR images does not necessarily reflect clinical symptoms of TMJ disorders.²⁻⁵ Although the analysis of these disorders is complex, the application of general principles is adequate for planning treatment. Nevertheless, Wallace and Klineberg⁶ have asserted that the significance of TMJ symptoms should be assessed through clinical examination. Subjective and clinical findings have been emphasized because the specific features of temporomandibular disorders reflected by clinical symptoms are thought to be important in the response to treatment.

Therefore, we selected patients with temporomandibular disorders with either muscle pain or locking, both of which are representative temporomandibular disorders. The response to conservative treatment was evaluated by calculating the frequency of treatment attrition, and the duration of treatment. The purpose of this study was to determine the specific features of temporomandibular disorders, which may be useful in treatment selection.

Materials and Methods

A follow-up study was conducted in 150 of 252 patients with temporomandibular disorders who underwent conservative treatment between 1989 and 1992 at the Oral and Maxillofacial Surgery Department II of Matsumoto Dental College, Japan. Patients with arthritis, muscle disease, head or neck tumors, and TMJ disorder due to systemic causes, as well as those who had visited another hospital for treatment, were not included in this study. The 100 females and 50 males ranged in age from 11 to 75 years. Ninety-one patients had temporomandibular disorder (TMD) with muscle pain and 59 TMD with locking (Table 1).

Temporomandibular disorder with muscle pain was defined as the presence of myofascial pain or chronic muscle strain *without* destructive changes of bone in the temporomandibular joint and *with* impairment of temporomandibular joint function caused by muscle pain. The masseter, temporalis and lateral pterygoid muscles were tender upon palpation, however the temporomandibular joint was not.

Temporomandibular joint disorder with locking was defined as impairment of range of motion *without* destructive changes of bone in the temporomandibular joint, together with disk displacement without reduction detected using arthrography and/or magnetic resonance imaging (Toshiba, MRT-50A/II, 0.5T, Tokyo).

The patients with muscle pain received treatment which included counseling, physiotherapy, exercises, bite splints and anti-inflammatory medication, and removal of third molars when indicated because of pericoronitis. Those with temporomandibular joint locking also received manual manipulation, pumping, a pivotal splint and a stabilization splint. None of the patients in either group received arthroscopy or open surgery.

Conservative treatment of the patients with muscle pain was assessed as successful when muscle tenderness was absent or very mild, and the range of motion was greater than 38 mm for vertical excursion and greater

than six mm for protrusive and lateral excursions. Conservative treatment in the patients with locking was considered successful when temporomandibular pain during movement was absent or very mild and the range of motion was greater than 38 mm for vertical excursion and greater than six mm for protrusive and lateral excursions. Moreover, in either group, conservative treatment was considered successful when the patient was able to eat a normal diet, although it might be necessary to avoid tough or hard foods, and when the patient experienced minimal discomfort while eating.

The duration of follow-up after treatment ranged from 6-40 months, and each patient was assessed every 3-6 months. Subjects who did not attend a follow-up appointment for an interval of more than 15 months during the treatment were assessed to have discontinued treatment.

The incidence of completion of treatment and the duration of treatment in the two groups with muscle pain and with locking were compared, and the relationship between treatment completion and age was examined. The means and standard deviations were calculated, and students' t-tests were used to compare the groups. A probability (p) value of less than 0.05 was considered statistically significant.

Results

The distribution of age at the first examination in the temporomandibular disorder patients with muscle pain and with TMJ locking is shown in Table 1: 25.2% of those with muscle pain and 28.8% of those with locking were 20-29 years of age. While the former group showed fairly uniform age distribution, the percentage of patients with TMJ locking over the age of 49 years was lower than that of the patients with muscle pain.

Table 2 shows the duration of treatment in the patients who did and did not complete treatment. Of the patients with muscle pain, 38.5% (35/91) completed treatment, and of those with locking 45.8% (27/59) completed treatment. Of the males with muscle pain and with lock-

Group	Age(yr.) Sex	11-19		20-29		30-39		40-49		50-59		60<	
		M	F	M	F	M	F	M	F	M	F	M	F
Patients w/muscle pain (n = 91) No. (%)		8 (8.8)	9 (9.9)	9 (9.9)	14 (15.3)	2 (2.2)	8 (8.8)	6 (6.6)	11 (12.1)	1 (1.1)	9 (9.9)	6 (6.6)	8 (8.8)
Patients w/TMJ locking (n = 59) No. (%)		5 (8.5)	12 (20.3)	7 (11.9)	10 (16.9)	3 (5.1)	6 (10.2)	1 (1.7)	10 (16.9)	1 (1.7)	2 (3.4)	1 (1.7)	1 (1.7)

Table 2
Duration (days) of Treatment in the Patients
Who Did and Did Not Complete the Treatment Program

Group	Sex	n	Completed		Did not complete	
			days (mean ± S.D.)	n	days (mean ± S.D.)	n
Patients w/muscle pain (n = 91)	M	15	47.1 ± 63.2	17	93.6 ± 209.1	
	F	20	46.0 ± 47.3	39	91.5 ± 205.4	
Patients w/TMJ locking (n = 59)	M	9	272.2 ± 382.9	9	72.2 ± 38.4	
	F	18	234.0 ± 185.1	23	106.9 ± 141.7	

* P < 0.05 ** P < 0.001

ing, 46.9% (15/32) and 50% (9/18), respectively, completed treatment, whereas the percentages in the females were 33.9% (20/59) and 43.9% (18/41), respectively. Therefore, the attrition rate in males and females with muscle pain and males and females with locking was 53.1, 66.1, 50.0 and 56.1%, respectively.

Among the patients who completed treatment, the duration of treatment in those with muscle pain (males: 47.1 ± 63.2; females: 46.0 ± 47.3 days) was significantly shorter than that in those with locking (males: 272.2 ± 382.9, p < 0.05; females: 234.0 ± 185.1 days, p < 0.001). However, among the patients who did not finish treatment, the duration of treatment in those with muscle pain (males: 93.6 ± 209.1; females: 91.5 ± 205.4) was not significantly different from that in those with locking (males: 72.2 ± 38.4, females: 106.9 ± 141.7 days). The patients with muscle pain who completed treatment showed shorter duration of treatment than those who did not, whereas the patients with locking who completed treatment showed longer duration than those who did not.

Discussion

Mintz⁷ demonstrated that TMD is as prevalent in the juvenile population as it is in the adult population. In this study, patients with muscle pain, classified as a nonarticular disorder, had a fairly uniform age distribution, while few of the patients with TMJ locking were over the age of 50 years. This finding suggests that the symptoms of TMJ locking may not always progress with age, and that locking is not irreversible in some patients. Varied duration of treatment in patients who completed treatment with locking was shown by high coefficients of variation. Even if the duration of treatment in those with locking was longer than that in those with muscle pain, the response to conservative treatment in locking could still be satisfied. Although it is interesting that there were no differences among those who did not finish treatment in

the attrition rate or in the duration of treatment between the patients with muscle pain and those with locking, the different characteristics of the two groups may be valuable in their clinical differentiation, as was also noted for differences in muscle elasticity (McKay and Yemm)⁸ and pain threshold (Xie and Hampf).⁹ In addition, high coefficients of variation in patients with muscle pain or locking who did not complete, may include various patients with poor prognosis or recurrence who did not show any effect of the conservative treatment, and minority negates continuation of a treatment.

Moses, et al.² found that MRI scans after arthroscopic operation revealed that 92% of patients had persistent anterior disk displacement, although 80% of the patients showed marked improvement in disk mobility. Kobayashi, et al.,³ using arthrograms, noted no reduction of either mouth opening or closing after arthroscopic surgery in any patient with anterior disk displacement. Recently, De Laat, et al.⁴ reported that 50% of patients with clinically diagnosed myogenous limitations of mouth opening with normal disk position showed MRI evidence of closed lock and anterior disk displacement with reduction. Goddard⁵ found no signs or symptoms of TMJ disorders in subjects diagnosed with TMJ articular disk displacement. As indicated by Goddard,⁵ there may be pre-existing asymptomatic closed lock in young subjects who have no previous history of any TMJ disorders. Therefore, patients with roentgenographic findings for TMJ locking may show considerable variation in clinical symptoms, ranging from symptom-free to muscle pain and movement fixation, although roentgenographic findings for locking are an important consideration in the definition of TMJ locking. The interaction between anterior disk displacement and subjective and clinical findings seems to be the critical factor which determines temporomandibular locking.

Goss^{10,11} stated that, although the absence of symptoms for at least two years is one criterion for the success of

nonsurgical and surgical treatment, both surveys and interviews indicate that there is considerable difference of opinion on the appropriateness of some criteria. The present follow-up study revealed that although the treatment itself differed in the two groups, there are clear differences between patients with locking and with muscle pain in the incidence of treatment completion and the duration of treatment. Given these considerations, the separate classification of patients with muscle pain and with locking may be useful in the diagnosis and treatment selection for temporomandibular disorders. As previously described, incidence analysis demonstrated that conservative treatment is frequently successful in TMJ locking, although duration of treatment is various. As compared with open surgery and arthroscopy, which carry surgical risk and are expensive, conservative therapy may be useful during the period of evaluation and management in patients with symptoms severe enough to justify surgical treatment since conservative treatment helps to ameliorate TMJ locking. The response of some patients with locking may be poorer with conservative treatment than those patients with muscle pain. Therefore, we favor additional treatment, such as open surgery or arthroscopy, only after an initial conservative therapy period of about 250 days. It may be appropriate, however, to offer surgical therapy to patients with severe locking within about 100 days after the start of conservative treatment if a lock-relieving clinical effect is anticipated.

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