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A Clinical Study of Temporomandibular Joint Disorders -An Analysis Based on the Japanese Subtype Classification-

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In this study, cases of temporomandibular joint disorder (TMJD) were analyzed based on the subtype classification established by Japanese Society for the Temporomandibular Joint (JSTMJ) in 2001.

The subject of our investigation consisted of cases who visited to the department of Oral and Maxillofacial Surgery of Kobe University Hospital in 2002 because of TMJD. Among them, any cases with no physical examination or strong psychogenic factors related to their symptoms were excluded. As a result, a total of 195 cases were investigated in this study. These cases consisted of 50 males and 145 females with a mean age of 38.1 years, and they were classified as type I (28 cases), type II (7 cases), type IIIa (91 cases), type IIIb (44 cases) and type IV (25 cases). The most frequently used therapy of the all diagnostic categories was a stabilization type of splint therapy (99 cases), and medication with muscle relaxants (52 cases) or analgesics (50 cases) ranked thereafter. All cases were followed until December 2004, and the results of the treatment were classified into 5 categories of 'improved', 'effective', 'no change', 'deteriorated' and 'discontinued'. No cases with a deterioration of symptoms were observed, while 109 cases (55.9%) were assessed as either 'improved' or 'effective'.

Temporomandibular joint disorder (TMJD) is a global common disease, which generally includes a number of separate entities and multiple etiologies, whose clinical signs or symptoms are almost always clustered into muscle disorders, intracapsular derangements of the components of the temporomandibular joint (TMJ), and degenerative changes in the bony components of the joint itself [1]. There are various conservative and surgical methods for treating TMJD [2-7]. Some clinical trials have suggested splint therapy [8-11] to be effective for treating the signs and symptoms of TMJ as a conservative method.

Up to date, various diagnostic criteria for the clinical subtypes of TMJD have been proposed [12], however, no definitive global standardized criteria have yet been established. In 2001 Japanese Society for the Temporomandibular Joint (JSTMJ) established the subtype classification of TMJD which is the most common and usual criteria now in use in Japan [13] (Table 1). The diagnostic procedure of this classification is characterized by making an exception of categories according to turn of type IV – III – I – II – V (Table 2). To verify the usefulness of this diagnostic criterion and to clarify the adequate treatment strategy based on each category, the cases of TMJD which presented at our hospital were classified

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base on this subtype classification, and were examined retrospectively regarding the clinical features including the therapeutic methods and then they were evaluated regarding the treatment results.

Table 1. The subtype classification of temporomandibular joint disorder established by the Japanese Society for the Temporomandibular Joint in 2001.

Type I; Masticatory muscle disorder
There is jaw movement pain in the muscle whose region can be identified.

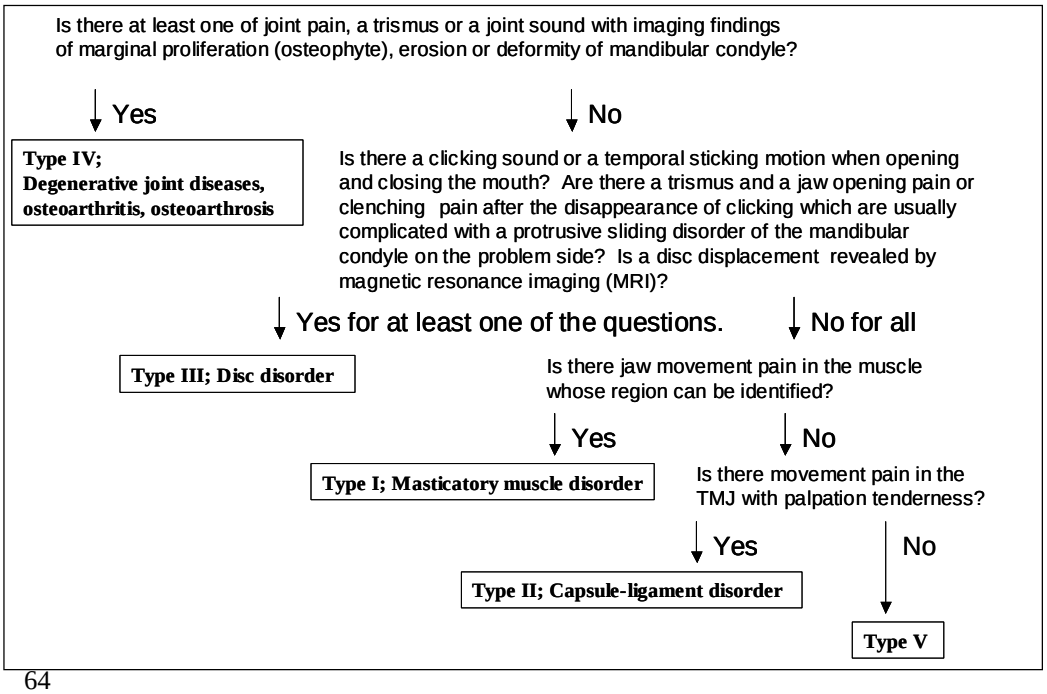
Type II; Capsule-ligament disorder
There is movement pain in the TMJ with palpation tenderness.
(This category includes chronic and traumatic diseases of either the retrodiscal tissue, joint capsule or ligament)

Type III; Disc disorder
Type IIIa; Disc displacement with reduction
There is a clicking sound or temporal sticking motion when opening and closing the mouth.
Type IIIb; Disc displacement without reduction
There is trismus and jaw opening pain or clenching pain after the disappearance of clicking.
A protrusive slide of the mandibular condyle is usually disturbed on the problem side.

Type IV; Degenerative joint diseases, osteoarthritis, osteoarthrosis
There is at least one of joint pain, a trismus or a joint sound. A picture image reveals marginal proliferation (osteophyte), erosion or a deformity of the mandibular condyle.

Type V; Cases not included type I-IV

Table 2. The procedure for the diagnostic classification of temporomandibular joint disorder as established by the Japanese Society for the Temporomandibular Joint in 2001.



PATIENTS AND METHODS

Two hundred and seven patients visited to the department of Oral and Maxillofacial Surgery of Kobe University Hospital between January and December in 2002 because of TMJD. Among them, ten cases without a physical examination were excluded, and the rest (197 cases) were classified into the diagnostic categories according to the diagnostic criteria of JSTMJ (Table 2) [13]. Although JSTMJ recommended us to avoid classifying the patients into complex categories, there were no detailed criteria for the cases with bilateral symptoms. According to a previously published report [14], each side of bilateral cases was classified in this study, and then was put into a single category by giving priority in the following order: type IV – III – I – II – V. In this study, type V cases were omitted because there were numerous psychogenic factors related with their symptoms. As a result, 195 cases were included as subjects in our study. All subjects underwent radiographical examinations using a panoramic view and a lateral oblique transcranial projection to check for osteoarthritis, and 59 cases were also investigated by a magnetic resonance imaging (MRI).

All cases were followed until December 2004 (the mean of follow-up periods = 71.4 days) and the results of treatment were evaluated and classified into 5 categories in compliance with the previous published report as described below [14]. The cases whose pain disappeared with more than 40 mm of mouth opening range and with little or no joint sound were classified as ‘improved’. The cases whose symptoms did not improve as much as the ‘improved’ group, but nevertheless did show some improvement, were classified as ‘effective’. The cases whose symptoms did not change at all were classified as ‘no change’, and as ‘deteriorated’ when symptoms became worse. The cases whose treatment was discontinued for the patient’s own reasons were classified as ‘discontinued’.

RESULTS

Under the criteria of the JSTMJ, 195 cases were classified as follows: 28 cases as type I, 7 cases as type II, 91 cases as type IIIa, 44 cases as type IIIb and 25 cases as type IV (Table 3). The cases consisted of 50 males and 145 females with a mean age of 38.1 years (Fig. 1). The 20-29 age group ranked top of the males (43.1%), whereas the 30-39 age group was the top of females (27.2%).

Table 3. Number of cases according to the diagnostic categories

	Type of the diagnostic categories				
	Ⅰ	Ⅱ	Ⅲa	Ⅲb	Ⅳ
Female	18	4	64	35	24
Male	10	3	27	9	1
Total	28	7	91	44	25

Fifty-six of the 195 cases (28.7%) had symptoms on the bilateral sides (Fig. 2). Concerning type I category, 6 cases had the same symptoms on both sides, while 3 cases had type II symptoms on the opposite side. There were no type II cases with bilateral symptoms. In type IIIa (91 cases), the opposite sides of 25 cases were also diagnosed as type IIIa while 5 cases were diagnosed as type I. Seven of 44 cases in type IIIb were accompanied at the

opposite side by type I, 5 cases by type IIIa and 2 cases by type IIIb. In the cases of type IV, there was only one case with type I and 2 cases with type IIIa on the other side.

The most frequently used therapy throughout all diagnostic categories was a stabilization type of splint therapy (99 cases) (Fig. 3). This method was the most frequently used for type IIIa in number, whereas it was also frequently used for both type IV (68.0%) and in type IIIb (63.6%). The next most frequently used therapy was medication with muscle relaxants (52 cases) which was then followed by analgesics (50 cases). These drugs were also frequently used for type IIIa. On the other hand, only one case underwent surgery (discectomy) in the type IV. No therapy was performed in 28 cases, including 26 cases of type IIIa whose only symptom was joint sound.

Fig. 1. Distribution of age and sex

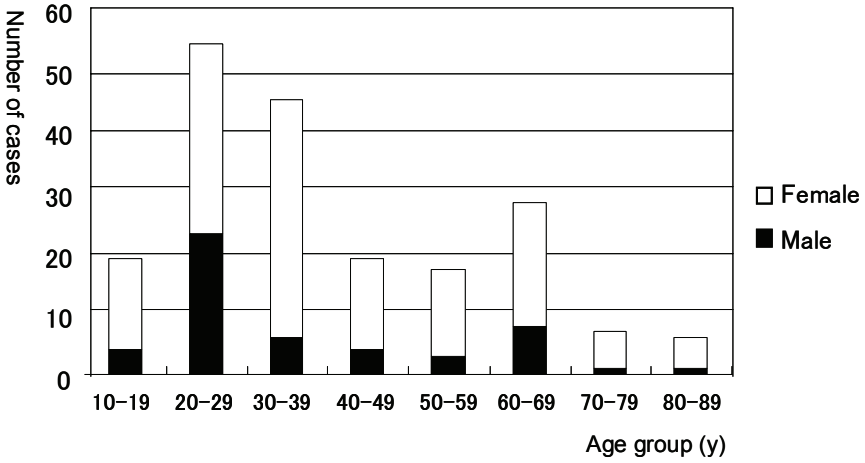
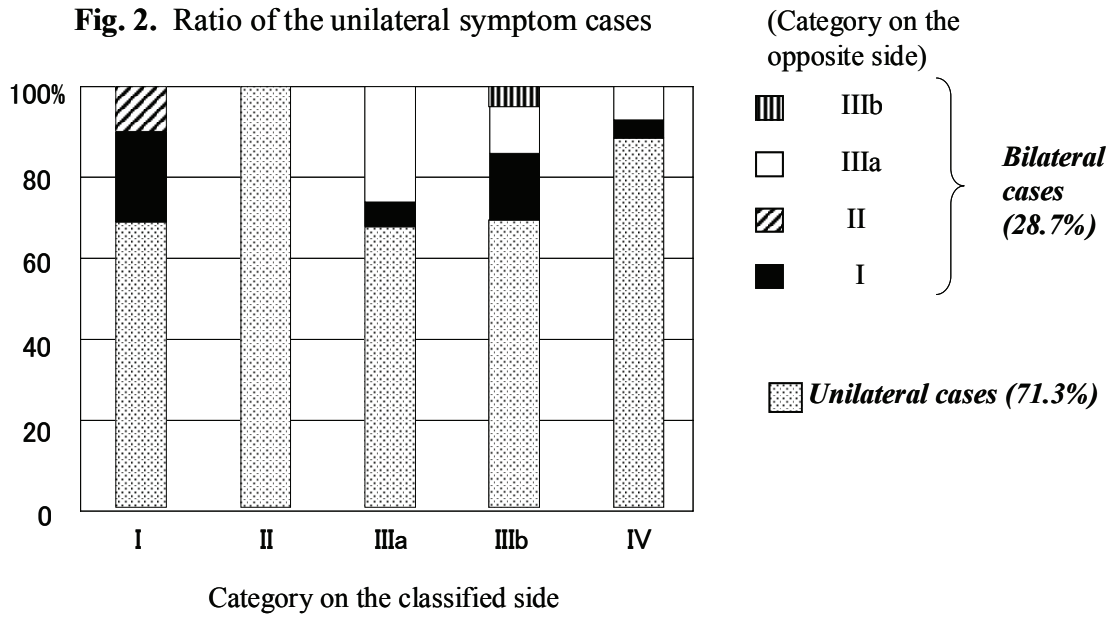


Fig. 2. Ratio of the unilateral symptom cases



As a result of the treatments, no case of a 'deterioration' was observed, and 109 cases (55.9%) were assessed as either 'improved' or 'effective' (Fig. 4). About 20% of every category discontinued the treatment and thus were classified as 'discontinued'. 7 cases in type IV (28%) showed 'no change'.

Fig. 3. Therapeutic methods according to the diagnostic categories

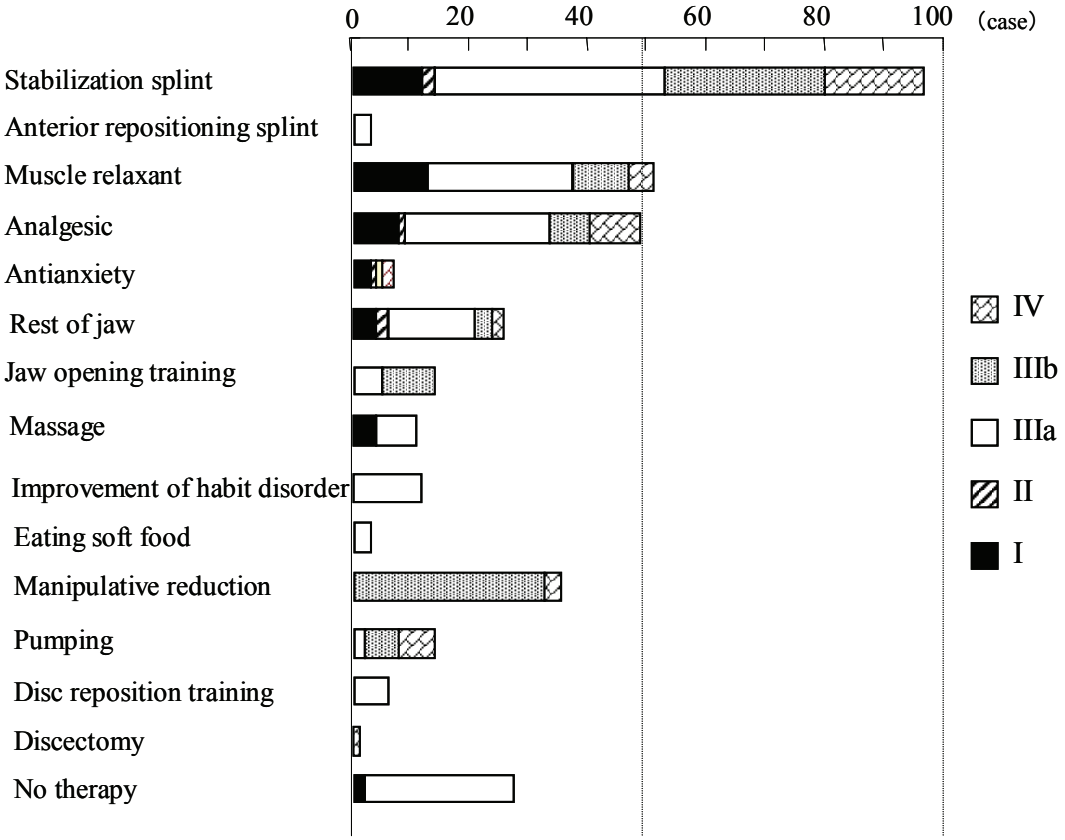
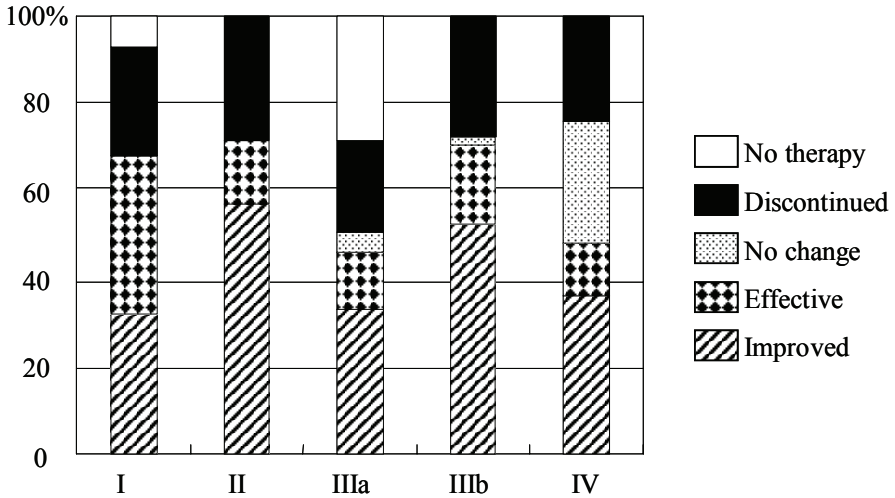


Fig. 4. Results of treatment according to the diagnostic categories



DISCUSSION

Patients with temporomandibular joint disorder (TMJD) have pain on muscle palpation or mandibular movements (or both), joint sounds and a limited mandibular range of motion. These problems may occur simultaneously, separately, fluctuate over time, or become chronic. The incidence of this disease is high in young females [2]. It had been shown that clicking of temporomandibular joint (TMJ) was most frequent in the 15-25 year age range, and clicking and locking with pain in the 25-35 year age range [15]. This study demonstrated a high incidence in the 20-29 or 30-39 age groups, which are similar to those of other reports.

Concerning the therapeutic methods, there was no distinguishing characteristic for each diagnostic category. The most used therapy in this study was a stabilization type of splint therapy, which was most frequently used for type IIIa but it was performed on all diagnostic categories. This therapy is simple and painless for the patients as a conservative treatment, therefore a splint was widely used in this study. Clinical trials in cases with TMJ pain and dysfunction have suggested that a stabilization type of splint therapy is effective, especially for TMJ internal derangement, and it is easier to tolerate for patients in comparison to an anterior repositioning splint [3, 4]. These splint therapies were considered to correct the dysfunctional state by decreasing the TMJ loading, and thus promoting healthy synovial fluid production [9, 16, 17]. On the other hand, 'rest of jaw' and 'improvement of habit disorder' were also adapted as the therapeutic methods in this study. Since the patient life style is closely associated with etiology, good habits of jaw movement is also effective for TMJD.

As a result of treatment in all types, no cases in this study showed deterioration. In addition, 109 of all cases (55.9%) were assessed as either 'improved' or 'effective', and thus our treatments were considered to be successful. This success rate, limited into type IIIa and type IV, decreased to 46.6%, because 28.6% of type IIIa received 'no therapy' and 28% of type IV showed 'no change'. Most of type IIIa received 'no therapy' consisted of cases with only a joint sound, causing no problem in the patient's daily life, while most 'no change' in the type IV showed no improvement in their mouth opening range. Forty-six of all cases (23.6%) discontinued their treatments. The reasons of 'discontinuance' were not clear but it was presumed that patients had either recovered, or gave up the idea of getting better because his symptoms resisted treatment for a long time. Other clinical studies in Japanese also showed high discontinuance rates ranging from 36% to 53.6%, which are considered to be a clinical feature of TMJD [14, 18-20].

Various diagnostic criteria for clinical subtypes of TMJD have been proposed [12], however, there are still no definitive global standardized criteria. JSTMJ established the subtype classification of TMJD in 2001 which is the most common and usual criteria in Japan. The diagnostic procedure of this classification is distinct since they give priority in the following order: type IV – III – I – II – V. According to these criteria, cases having both of muscle disorders and disc disorders or degenerative joint are not classified into type I but into type III or type IV. The JSTMJ recommended us to avoid diagnosing as complex categories. However, a problem remains regarding how to classify the patients demonstrating bilateral symptoms which accounted for 28.7% in this study.

Another problem is that these diagnostic criteria do not always help in selecting the appropriate treatments. Therefore, these criteria need to be further discussed in order to select the optimal treatments for such cases.

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