Original Article

ORAL HABITS OF TEMPOROMANDIBULAR DISORDER PATIENTS WITH MALOCCLUSION

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Abstract

The purpose of this study was to clarify the relationship between oral habits and symptoms of temporomandibular joint disorder in patients who had sought orthodontic treatment by analyzing their present and past history.

The subjects were 57 female patients (average age: 23 years and 6 months old) who had visited the "Temporomandibular Disorder Section" in our orthodontic department. Their chief complaints were the symptom of TMJ and the abnormalities of occlusion such as maxillary protrusion, open bite, crowding, mandibular protrusion, cross bite, deep bite, edge-to-edge bite, and spacing. Their present conditions and past histories were examined and evaluated. The most typical primary symptom was joint sound (23 patients, 40.0%). The second was joint sound and pain (15 patients, 26.3%). Of the symptoms present at the time of examination, the most prevalent were joint sound and pain (20 patients, 35.1%). The 48 patients (82.8%) had significant oral habits. Unilateral chewing was seen in 35 patients (72.9%), bruxism in 27 (56.3%), abnormality of posture in 14 (29.2%), habitual crunching in 10 (20.8%) and resting the cheek on the hand in 4 (8.3%), respectively. When comparing the primary symptoms to those at the time of examination, the patients with unilateral chewing and bruxism tended to have more complicated symptoms. In conclusion, the TMD symptoms of the patients with notable oral habits did not change or become worse during a period of about 5 years.

Key words: Oral habit—TMD—Malocclusion—Present and past history

INTRODUCTION

The etiology of temporomandibular joint disorder (TMD) is considered to be multifactorial, including habits and parafunction³⁾; however, there are only a few articles exam-

ining these elements. Molina⁷⁾ reported that TMD and bruxing patients may present many other additional oral jaw habits which may combine to increase masticatory muscle activity, thus leading to TMD signs and symptoms. Winocur¹⁴⁾ reported that jaw movement

Fig. 1 Distribution of consultation

Table 1 The consultation ages of patients

	Number	Average age
Female	57	23y6m (12y10m–42y2m)

Table 2 Distribution of abnormal occlusion

	Number	%
Maxillary protrusion	15	26.3
Open bite	15	26.3
Crowding	12	21.1
Mandibular protrusion	7	12.3
Cross bite	5	8.8
Deep bite	1	1.8
Edge-to-edge bite	1	1.8
Spacing	1	1.8
Total	57	100.0

was the most detrimental habit in TMD; intensive gum chewing was a potentially contributing factor for joint sound and pain. The purpose of this study was to clarify the relationship between oral habits and TMD symptoms in patients seeking orthodontic treatment.

SUBJECTS AND METHODS

The subjects were 57 female patients, who

were seen from November of 1995 to April of 1998 in the “TMD section” of the Department of Orthodontics in Tokyo Dental College. The section was set up to investigate and analyze the relationship between TMD and malocclusion as patients’ chief complaints. The patients’ ages were from 12 years and 10 months to 42 years and 2 months, and the average age was 23 years and 6 months (Table 1, Fig. 1). The distribution of malocclusion was open-bite in 15 patients, maxillary protrusion in 15 patients, crowding in 12 patients, and mandibular protrusion in 7 patients (Table 2). The average period from the primary symptom to the present symptoms was 5.18 years (Fig. 2).

“The Craniomandibular Disorders Protocol”⁶⁾ by the Japan Jaw Function Institute was used for the examination (Table 3).

Initially, each patient was asked about joint sound, pain, and abnormal function. Next, the patient’s TMJ area was examined while opening and closing the mouths.

To determine the primary symptoms, time, age, the type of pain (spontaneous pain, exercise pain, and chewing pain), existence of restricted mouth opening, timing of the type (clicking, crepitation) and presence of joint sound, and any other symptoms were asked. Present symptoms were queried in same way. Lateral chewing was examined several times by observing the patient’s behavior

Fig. 2 The period from the primary symptoms to present symptoms

Table 3 The excerpt from the Craniomandibular Disorders Protocol

Primary symptoms	1) Pain	Position (right, left) Type (spontaneous pain, exercise pain, chewing pain)
	2) Restriction of mouth opening	
	3) Joint sound	Position (right, left)
	4) Other symptoms	
Present symptoms	1) Pain	Position (right, left) Type (spontaneous pain, exercise pain, chewing pain)
	2) Restriction of mouth opening	
	3) Joint sound	
	4) Other symptoms	
Habits	1) Bruxism	Type (clenching, grinding, tapping)
	2) Unilateral chewing	Position (right, left)
	3) Crunching	
	4) Tongue thrust	
	5) Abnormality of posture	
	6) Other habits	

when biting a cotton roll and chewing. Bruxism (clenching, grinding, tapping) and habitual crunching were investigated by inquiry. The existence of the spine arcuation disease, inclination of the head cervix, head forward posture, and the patient's posture entering and leaving the consultation room and sitting on the chair were observed and noted, and abnormalities of posture were

explored¹¹⁾. The existence and position of resting the cheek on the hand was examined by inquiry. The attrition of the teeth was examined, and their plaster model was evaluated. The area of the attrition was classified into the incisors area, the canine area, the molars area, incisors and canine area, canine and molars areas combined, and all of the incisors, canine and molars areas combined.

Fig. 3 Primary and present symptoms

Fig. 4 Distribution of habits

Fig. 5 Correlations of primary and present symptoms of the with habit patterns

Fig. 6 Comparison of the distribution of tooth attrition with habits

RESULTS

Of the primary symptoms, there were many patients who reported joint sound alone (23 patients, 40.4%). The second most common was joint sound and pain (15 patients, 26.3%). Of the present symptoms, the most common was this combination of joint sound and pain (20 patients, 35.1%). The patterns of primary and present symptoms and their time-dependent changes are shown in Fig. 3.

Fifty of the 57 patients (87.7%) had some clinically significant habits (Fig. 4). There were 35 patients with unilateral chewing (61.4%); this was the most common. The second most frequent was bruxism (27 patients, 47.4%), followed by abnormal posture (14 patients, 24.6%), habitual crunching (10 patients, 17.5%), resting the cheek on the hand (4 patients, 7.0%), and tongue habit (1 patient, 1.8%).

When comparing the primary symptoms to those at the time of examination, the patients with unilateral chewing and bruxism tended to have more complicated symptoms (Fig. 5). In contrast, among the patients without unilateral chewing and bruxism, the number with multiple symptoms decreased. In some of these, their symptoms disappeared.

Notable attrition was observed in the patients with unilateral chewing and bruxism, and the attrition was more widespread for the incisors, canines, and posterior teeth than in patients without these habits (Fig. 6).

Although the patients without bruxism or unilateral chewing had comparatively less widely distributed attrition, the patients with unilateral chewing tended to have an especially wide range of attrition.

DISCUSSION

Isibashi *et al.*⁵⁾ reported that TMD was prevalent in patients with bruxism and unilateral chewing. According to the investigation of Hirasawa *et al.*⁴⁾, habits with significance at the 5% level between TMD symptomatic patients and normal persons were unilateral

chewing and resting the cheek on the hand. Fujisaki *et al.*²⁾ reported that there were significant differences ($p < 0.01$) between TMD patients and non-syndrome in the clenching, unstable occlusion, unilateral chewing, stress, and resting on the cheek on the hand. In according to the report of Taguchi *et al.*¹²⁾, there were high incidences of TMD in patients with deciduous crowns and unilateral chewing. Unilateral chewing was most frequent habit in this study. The importance of chewing guidance in the TMD patient is clearly indicated.

The second most frequent habit was bruxism; however, the diagnosis of bruxism is determined by asking the patient if she realizes doing it, or by detecting attrition of the tooth (especially, attrition of the cusp of canine and bicuspid). Therefore, bruxism during unconscious sleep may be missed. It is estimated that the prevalence of bruxism is higher, if undetected patients are considered.

In the meantime, Travell¹³⁾ described by the forward head posture, the turgescence occurs in the cervix, and pain happens in the cervical area. Also, Darnell¹⁾ said that the muscle of cervix and shoulder which support the head by the forward head posture, and fatigue, discomfort, pain of the muscle are being brought about. In this study, the habit abounding for the third was the abnormal posture, and it agreed with their opinions.

There are few reports about TMD patient without treatment. Hirasawa *et al.*⁴⁾ investigated the change of the TMJ noise, and 34 patients among 301 patients improved the symptom (10%). Ono *et al.*¹⁰⁾ indicated that the TMJ sound of primary symptoms is a key as the prevention of TMD including pain or restriction mouth opening. In this study, the pain and restricted mouth opening of the patients with single habit tended to disappear, however the symptoms of the patients with multiple habits were reminded. If there is no habit, there must be small load in TMJ and muscle of mastication. If multiple habits exist, it seems to cause the deterioration of the TMD symptom. Nakamichi⁹⁾ reported that unilateral chewing causes the contraction of

working side bone, and in the balancing side, arcuation of the face axis is caused by the strain. These habits become the risk which the other habits were caused, and further the symptom may deteriorate. It is necessary to control the habit not only active treatment period but also retention period.

Molnar⁸⁾, Yamakage¹⁵⁾ described that property of the food, chewing modes and habit etc. are reflected for attrition of the tooth. The attrition was comparatively widely recognized the patients with the habits in comparison with patients without the habits in this study. Especially, it seemed that unilateral chewing and bruxism are related with attrition. The relation between these habits and the quantity of attrition will have to be investigated in detail.

It must be thought that it is necessary to control the habits for the TMD patients performed orthodontic treatment.

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