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Position paper

Japan Prosthodontic Society position paper on "occlusal discomfort syndrome"

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ABSTRACT

Purpose: Dentists may encounter patients who present with a sense of a malocclusion but in whom no objective findings can be detected. For the patient who insists that there is occlusal discomfort, in the absence of evidence some dentists elect to perform an occlusal adjustment that not only fails to alleviate symptoms, and may, in fact, exacerbate the discomfort. The patient–dentist relationship is then likely compromised because of a lack of trust.
Study selection: In 2011, the Clinical Practice Guidelines Committee of the Japan Prosthodontic Society formulated guidelines for the management of occlusal discomfort. When formulating clinical practice guidelines, the committee bases their recommendations on information derived from scientific evidence. For ''occlusal dysesthesia,'' however, there are an insufficient number of high-quality papers related to the subject. Therefore, a consensus meeting was convened by the Japan Prosthodontic Society to examine evidence in the Japanese- and English-language literature and generate a multi-center survey to create an appropriate appellation for this condition.
Results: As a result of the consensus meeting and survey findings, this condition may be justifiably termed ''occlusal discomfort syndrome.''
Conclusions: The Japan Prosthodontics Society believes that identification of an umbrella term for occlusal discomfort might serve as a useful guide to formulating clinical practice guidelines in the future. This position paper represents summary findings in the literature combined with the results of a multicenter survey focused on dental occlusal treatment and the condition of patients who present with occlusal discomfort syndrome.

Contents

1. Introduction

Dentists are occasionally confronted with a so-called ''complex case'', e.g., limited attainment with endodontic reamers because of an excessively curved root, extreme bone resorption caused by aggressive periodontal disease, lack of space for prosthodontic treatment, and insufficient stability and support secondary to atrophy of an edentulous mandible. Although these situations are undoubtedly ''complex,'' the difficulties usually arise from anatomical constraints that the dentist can see directly or indirectly through imaging. In many instances, advances in dental technology and dental materials and a better understanding of optimal clinical techniques have made it feasible to address these challenges and manage them successfully.

In contrast to ''visualizable complex cases,'' dentists also experience ''non-visualizable complex cases,'' such as occlusal discomfort and abnormal sensitivities relating to dental occlusion. Affected patients complain about tooth contact even while it is difficult for dentists to detect obvious abnormalities in the occlusal surfaces and despite the availability of diagnostic devices like occluding paper and wax or silicon bite registration material. Some clinicians believe they cannot avoid having to perform an occlusion adjustment in response to the patient's demand to ''do something'' despite the absence of an obvious ''something to do''. Such pressure on the dentist can lead to treatment that is ''patient feelings-oriented''. Unfortunately, in many instances the complaint does not disappear and sometimes may take a turn for the worse. Furthermore, as a consequence of a sub-optimal treatment outcome, the patient–dentist relationship may deteriorate.

In 2011, the Treatment Guideline Committee of the Japan Prosthodontic Society discussed establishing treatment guidelines for ''occlusal dysesthesia.'' The Committee attempted to create guidelines but was thwarted in its attempt at that time due to limited scientific evidence from only a few high-quality papers on ''occlusal dysesthesia''. To address the deficiency, a consensus meeting to evaluate ''occlusal dysesthesia'' was convened by the Japan Prosthodontic Society with the goal of determining an appropriate appellation for this condition.

The Committee has drawn upon all scientific evidence and the proceedings of the consensus conference and proposes the term ''occlusal discomfort syndrome.'' (ODS) This position paper has been written by the Committee to guide future research activities required to formulate and revise evolving clinical practice guidelines related to ODS. The material herein is derived from thorough scrutiny of the scientific literature and from the results of a multi-center survey on dental occlusal treatment and the current condition of patients suffering with ODS. This position paper is the second publication based on the aforementioned efforts with the prior work published by the Japan Prosthodontic Society [1].

2. Occlusal discomfort

It is necessary to understand the phrase ''abnormal sensation in the mouth'' before one can understand ''occlusal discomfort.'' It has been defined as ''the generic name of the case that the patient has an abnormal sense around [the] oral cavity, but absolute physical findings which can explain the main complaint of the patient are not found.'' This description has been reinterpreted as ''oral paresthesia.''

Paresthesia includes pain of the gingiva, cheek, and alveolar bone; a numb feeling, itchy feeling; burning sensation; paraphia; sensory sensitivity; foreign-body sensation; sense of discomfort; and ''abnormal sense of occlusion.'' It is obviously and by necessity defined in a broad sense using broad terms. According to the Society of Oro-Facial Neuronal Function, paresthesia is experienced as a tingle or a feeling of heat although there is no particular stimulus evident. Dysesthesia, in contrast, is impaired sensitivity to pain and stimulation or feeling an abnormal sensation. It seems that ''occlusal discomfort'' corresponds to the latter. Terms that have been used in the literature that are equivalent to occlusal discomfort include occlusal habit neurosis [2], positive occlusal sense [3], occlusal neurosis [4], phantom bite syndrome [5], positive occlusal awareness [6], persistent uncomfortable occlusion [7], and proprioception dysfunction [8].

In Japan, Kuboki proposed a diagnostic decision tree for occlusal discomfort. It was divided into two branches based on the presence or absence of occlusal disharmony. The author demonstrated the existence of occlusal discomfort broadly in each branch. Of particular relevance to the work of the Committee, occlusion dysesthesia is suggested to be idiopathic in the absence of clearly identifiable occlusal disharmony. Yamaguchi suggested the term ''persistent uncomfortable occlusion'' based on the results of a clinical study of a patient with occlusal discomfort [9]. The author described a patient with symptoms indicating occlusal discomfort as well as the dental and medical treatment which the patient received [10].

The academic term closest to representing occlusal discomfort, ''occlusal dysesthesia,'' was recently proposed by Clark and Simmon who defined occlusal dysesthesia as a ''persistent, uncomfortable sense of maximum intercuspation for more than 6 months after all pulpal, periodontal, muscle, and TMJ [temporomandibular joint] pathologies have been ruled out and a physically obvious bite discrepancy cannot be observed'' [11]. The same group published a review on the subject [12] while others reported on the disorder from the psychosocial aspect [13].

Given the context and content of these reports, this proposed pathologic condition is broadly defined as ''The condition where abnormal sensory perception regarding maxillary and mandibular occlusal tooth contact occurs as a result of dysfunction of the periodontal tissues, teeth, masticatory muscles, temporomandibular joints, peripheral nervous system (neuromuscular junction) and/or the central nervous system. The condition may manifest with or without the presence of obvious occlusal disharmony.

3. Definition of occlusal discomfort syndrome in the broad and narrow senses

As a unified term or a clear definition for discomfort related to occlusion does not exist, the term ''occlusal discomfort syndrome'' (ODS) for this pathology is proposed and temporarily classified into the following two conditions.

- Occlusal discomfort syndrome in the broad sense (ODS-Broad): A comprehensive syndrome of pathology characterized by discomfort related to occlusion. Obvious occlusal disharmony (idiopathic) may or may not be identifiable.
- Occlusal discomfort syndrome in the narrow sense (ODS-Narrow): An idiopathic syndrome of pathology characterized by discomfort related to occlusion, but having no relationship to occlusion. This is the same pathology associated with the occlusal dysesthesia defined by Clark and Simmon [11].

An important question is how to define and diagnose obvious occlusal disharmony. In 2002, the Japan Prosthodontic Society published clinical guidelines relating to occlusal disharmony. In these guidelines, *occlusion* is defined as the normal anatomical relation between the maxilla and mandible—the static or dynamic relation between the incising or masticating surfaces of the maxillary or mandibular natural or artificial teeth that is controlled by the structure of the TMJ and the physiological kinetic mechanism of the mandible. *Occlusal disharmony* is defined as a genetic or environmental phenomenon in which occlusion is not normal because of a developmental, anatomical, or functional disorder associated with the face, teeth, and/or periodontal tissue. It is further defined as an abnormal condition in which the static and dynamic relations between the upper and lower teeth are not in harmony with each other. Specifically mentioned are (1) abnormal contact relation; (2) abnormal occluding position; (3) abnormal occlusal contact; (4) abnormal mandibular movement; and (5) abnormal occlusion component.

Among these clinical possibilities, the most common occlusal disharmony is abnormal occlusal contact, which is classified into: (1) premature contact; (2) cuspal interference; and (3) loss of contact. The diagnostic criteria are as follows:

- Intercuspal position is stabilized in the condylar position.
- There is no premature contact when occluding in the intercuspal position that has stable occlusal contacts—that is, (1) simultaneous and multiple tooth contacts during closing; (2) bilateral balanced occlusal contacts; (3) at least four occlusal contacts on each side; (4) the position of occlusal contacts do not differ between weak and strong clenching.
- There is adequate guidance with no cuspal interference during eccentric movements—that is, (1) the working side contacts are between canines or canines and first premolars; (2) the non-working side contacts should not be so strong that they would interfere with the working side contacts; (3) occlusal facets of the lingual surface of the upper canines and the internal oblique surface of the buccal cusp of molars should be on the mesial side (M-type).

Along with these items, further consideration by the Japan Prosthodontics Society regarding enhanced examination methods and diagnostic tools are needed for an adequate clinical evaluation (diagnosis) of ODS.

3.1. *Occlusal discomfort syndrome in the narrow sense*

3.1.1. *Patient characteristics*

The age of patients with ODS ranges between 20 and 80 years. They have a relatively long history of symptoms usually more than 10 years. There is no clear evident gender difference in terms of prevalence. General findings include the following [14–18].

- Patients do not adapt to changes in their occlusal contacts and jaw relations brought about by subtle changes in occlusion after dental treatment.
- Patients perceive occlusal contact as incorrect or with extreme sensitivity even though their occlusion is normal.
- The syndrome may occur without any occlusion-influencing treatment.
- Patients believe that systemic symptoms are related to occlusion.
- Patients repeatedly visit many dental/medical offices and claim that they have been experiencing psychosocial and occupational disadvantages.
- Patients frequently verify their own occlusion and/or jaw relations.
- Patients fully believe that their ‘‘occlusion is abnormal’’ even though no objective occlusal abnormalities are apparent.
- Patients bring devices (e.g., prosthodontic devices, provisional crowns) provided during previous treatments, long letters/notes, and their own drawings when they visit new dental offices.
- Patients usually refuse to visit psychiatrists even though psychiatric disorders/diseases are recognized. Patients usually refuse medications.

3.1.2. *Associated causes/pathophysiology of the syndrome*

Psychiatric disorders/diseases may be responsible for, or associated with, ODS. Somatization due to psychiatric disorders (e.g., somatoform, mood, anxiety, personality, and paranoid disorders and schizophrenia) are considered primary causes [14]. According to Wake, 88 (48%) of 182 patients who had undergone medical interviews at the Liaison Clinic for Occlusion reported occlusal discomfort, and 74 (84%) of those 88 patients had psychiatric disorders [19].

Abnormal signal transmission and/or data information processing from the peripheral to the central nervous system may be involved. Changes in oral kinesthesia (motion perception) ability are possible. There may be distortion of input from peripheral sensory receptors in the periodontal ligament, TMJ, and masticatory muscles (i.e., mechanoreceptors in the periodontal ligament, TMJ, and muscle spindle of jaw elevator muscles) resulting in disturbances in signal transmission from peripheral to higher centers. A disturbed signal processing system in the central nervous system is considered one of the causes [11,20,21].

Kuboki et al. reported that the ‘‘memory’’ of a patient’s occlusion before treatment could remain in the central nervous system even after the occlusal condition has been alleviated through dental treatment. This memory could result in the sensation/perception of a certain occlusion after treatment which leads to failure to adapt to a new occlusal condition. As evidence, one report noted that patients with psychiatric disorders who complained of occlusal discomfort exhibited reduced blood flow in the cerebral cortex during mastication compared to healthy volunteers, indicating that activity in the cerebral cortex was decreased in these patients [22].

3.1.3. *Treatment*

As analgesics, splint therapy, prosthodontic treatment such as occlusal adjustment and reconstruction, orthodontic treatment, and surgical treatment may aggravate symptoms

[14,16,23], dentists are wise to collaborate with psychiatrists, clinical psychologists, and other medical doctors who deal with somatic illness [14,24]. One specific treatment modality is medical management with medications. Clonazepam, pimozide, milnacipran hydrochloride and amitriptyline have been recommended [11,14,23,25]. Cognitive behavioral therapy and brief psychotherapy by psychiatrists and/or clinical psychologists are also important adjuncts for a successful outcome [14,24]. Most importantly, dentists themselves can provide cognitive behavioral therapy and there are specific procedures for cognitive behavioral therapy provided by dentists.

- Educate patients stretch their masticatory muscles to prevent them from continually verifying their occlusion and/or teeth. Patients should also be instructed to avoid conscious daytime tooth clenching/contact (correcting the tooth contacting habit) [26], thereby modulating their obsession with occlusion and limiting its effects.
- Consider reducing stimulation to the site at which the patient complains of occlusal discomfort by temporarily using occlusal splints to correct the sensation of occlusal contact between maxillary and mandibular teeth. Explanation to patients should include at least four points: (1) there are no problems at sites about which the patient complains; (2) the changes in the sensation from mouth to brain (sensitization) are considered a more important problem; (3) occlusal discomfort cannot be diminished by ''fixing'' their occlusion; (4) symptoms could be alleviated to a level that patients could manage. In contrast, explaining to patients that their occlusal discomfort is due to their imagination or to mental issues should be avoided [14,24].

Recently, several institutions in which dentists can liaison with a psychiatric clinic reported favorable clinical treatment outcomes [10,19], indicating that such collaboration is a practical choice for providing effective care to these patients.

3.2. *Occlusal discomfort syndrome in the broad sense*

A definition of occlusal discomfort syndrome in the broad sense—that is, for patients who complain of occlusal discomfort regardless of whether they have a definitive occlusal abnormality, remains unestablished. Likewise, sub-classes, pathological aspects, and treatment methods have not been established leading to scenarios where management of patients with this condition is varied and left to the discretion of the individual facility or provider.

Because more data are needed from patients with this condition if we are to establish effective management protocols for them, a multicenter survey was conducted. Thirty (30) dental clinics in 20 dental schools in Japan were contacted and invited to participate in the survey, 17 of which returned the completed questionnaires for analysis. Data from a total of 179 patients (34 men, 145 women) were included in this study during the period of August 2010 to August 2011.

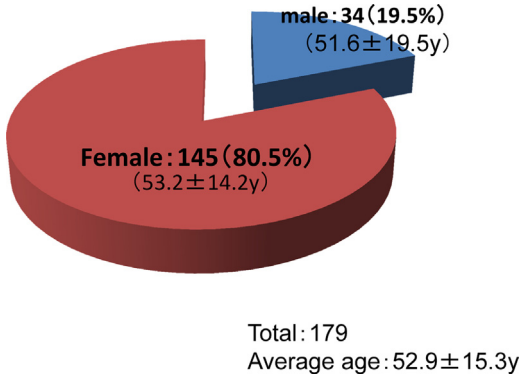

Fig. 1 – Frequency and sex of the subjects.

The facilities involved in this survey are as follows.

- Department of Oral & Maxillofacial Rehabilitation, Removable Prosthetics, Kanagawa Dental College
- Section of Implant and Rehabilitative Dentistry, Division of Oral Rehabilitation, Faculty of Dental Science, Kyushu University
- Division of Occlusion & Maxillofacial Reconstruction, Department of Oral Function, School of Dentistry, Kyushu Dental University
  - Department of Oral Rehabilitation and Regenerative Medicine, Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Okayama University
    - Department of Occlusal and Oral Functional Rehabilitation, Graduate School of Medicine, Dentistry, and Pharmaceutical Sciences, Okayama University
  - Department of Advanced Prosthodontics, Applied Life Sciences, Institute of Biomedical & Health Sciences, Hiroshima University
  - Department of Fixed Prosthodontics, Graduate School of Dentistry, Osaka University
- Division of Fixed Prosthodontics, School of Dentistry, Meikai University
  - Department of Dentistry, Jikei University School of Medicine
- Department of Oral Function and Rehabilitation, Nihon University School of Dentistry at Matsudo
- TMD Clinic, The Nippon Dental University Hospital
  - Department of Prosthodontics, School of dentistry, Showa University
- Department of Geriatric Dentistry, Tsurumi University School of Dental Medicine
- Department of Prosthodontics and Oral Implantology, Iwate Medical University
  - Department of Temporomandibular Disorders, Center for Advanced Oral Medicine, Hokkaido University Hospital
- Nishikawa Dental Clinic (need location added?)
- Tsukahara Dental Clinic (need location added?)

3.3. *Multicenter survey on occlusal discomfort syndrome*

3.3.1. *Purpose*

Some outpatients with occlusal dysesthesia visit general dental clinics. In most cases, the discomfort and sense of

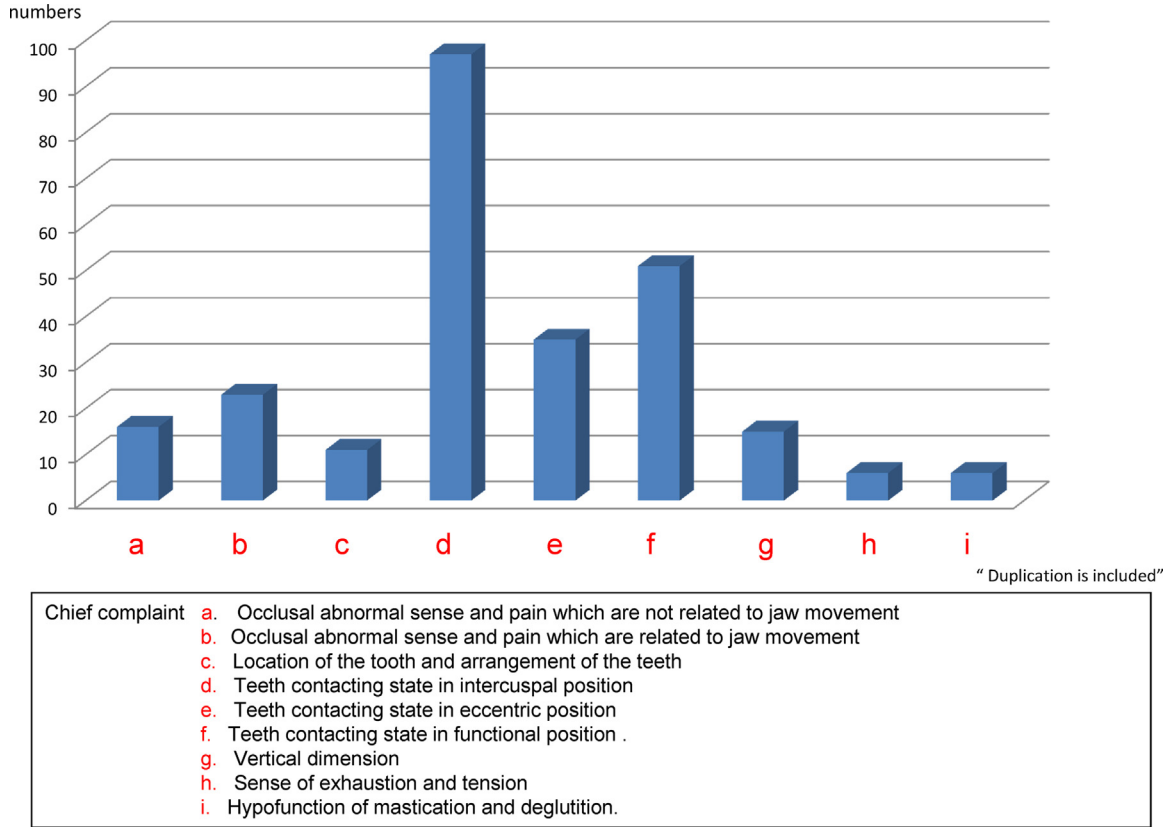

Fig. 2 – Categories of chief complaints.

instability upon tooth contact or the mandibular position and the sense of distortion of their dental arches arise idiopathically. The suffering of those patients is significant both functionally and psychologically.

More commonly, the dentists who encounter and manage patients with occlusal dysesthesia are usually specialists in prosthodontics or TMJ disorders. Recently, patients are managed by addressing the psychosocial etiology of their condition. However, no definitive concept to account for the symptoms has been established. Treatments often fail to relieve the discomfort despite great efforts with long-term irreversible occlusal treatment and application of occlusal splints.

An essential problem for the patients with these symptoms is that most dentists and the general public are unaware of the existence of this condition. At present, few appropriate epidemiological surveys have been performed. It is, therefore, urgent that the etiological factors and optimal management protocols for these patients be identified and clarified.

In the present study, multi-center data sampling during the course of dental treatment and the patients' post-treatment state was carried out to investigate the status of the patients with ODS. The outline of the survey was presented during the 22nd general meeting of the Japanese Association for Dental Science held in Osaka, Japan on November 10, 2012.

3.3.2. *Patients*

The general points are as follows:

- Patients included those who complained of any occlusal abnormal sense and were more than 20 years old.
- Chief complaints were pain, dull, tiredness, uncomfortable feeling, and/or occlusal instability.
  - The group included patients with and without obvious occlusal disharmony.
  - The patients who were included were those who started having a sense of occlusal abnormality during or after a dental treatment (periodontal, conservative, prosthodontic, orthodontic, oral surgery, or dental implant treatment).
  - Patients younger than 20 years old or who did not agree to take part in this survey were excluded.

3.3.3. *Survey parameters*

- Chief complaints relevant to occlusal abnormal sense
- Category of occlusal abnormal sense (dentist's subjective assessment)
- Duration of occlusal abnormal sense and number of medical and dental facilities visited
- Past treatment history
- Cause(s) suspected by dentists
- Visual analogue scale analysis of the sense of occlusal abnormality and recording activities of daily living

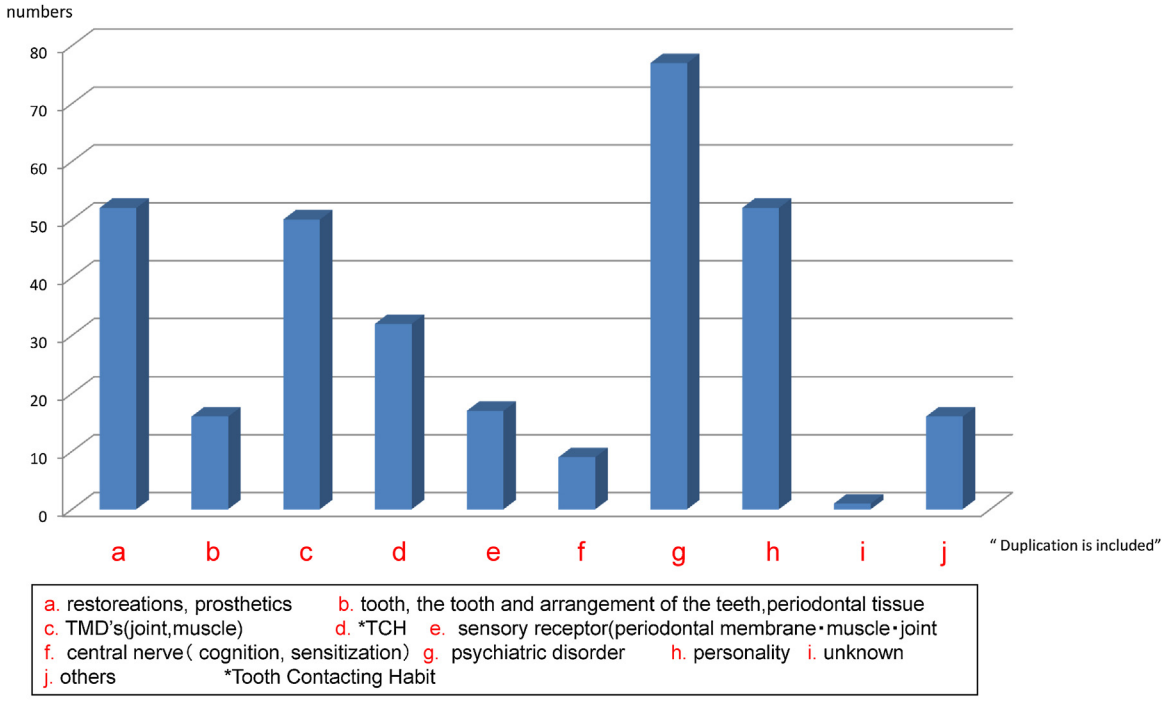

Fig. 3 – Categories of occlusal discomfort before treatment. TMD: temporomandibular disease.

- Organization of the dental treatment method (e.g., cooperation with dentistry independence and other departments, liaison)
- Patient motivation and expectation about the treatment; patient trust in the dentist
- Treatment details at the surveying clinic
  - Results

3.3.4. Results

- There were many middle-aged women among the patients at the 17 facilities (Fig. 1).
- Average duration of study period was 10.5 ± 30.0 months. Number of medical and dental facilities visited by the patients was 1.9 ± 1.8.
  - Chief complaints included many problems related to occlusal contact at the intercuspal position (Fig. 2).
  - Dentists thought "psychiatric disease" or "personality" was the reason for he sense of an occlusal abnormality, rather than a dental restoration, prosthesis, or TMJ disorder (Fig. 3).
- Many patients underwent various treatment techniques. "Prosthetic treatments" were performed in many cases (Fig. 4).
  - Reason given for treatment was to address symptoms, regardless of whether cause or association was proved or not proved (Fig. 5).
- Treatments were minor prosthodontic treatments and management of TMD. Also, many facilities performed psychological therapy in psychosomatic treatments (Figs. 6–8).
  - Results showed that some patient symptoms were not relieved after treatment (Fig. 9).

4. Discussion

The multi-center survey on occlusal discomfort syndrome in Japan revealed that although there was a large of variety of occlusal treatments conducted for dental caries, dental pulp extraction, and missing teeth, some patients had suffered for a long time and been subjected to multiple prosthodontic treatments. Although some of these patients had no clear occlusal disharmony, they experienced idiopathic occlusal discomfort. There were also some patients whose symptoms were caused by occlusal treatments. In addition, attempts to relieve symptoms for a second time were undertaken in some patients as a result of prosthetic treatment or treatment of a temporomandibular disorder (TMD).

It was determined from the survey that there were no established and consistently utilized treatment protocols for alleviating occlusal discomfort across the institutions that participated. Furthermore, sociological/psychological care or other treatments was not available at all institutions. In the narrow sense, patients who require such care would be diagnosed with occlusal discomfort syndrome. Such patients proved difficult to treat. For medical treatment at specialized medical institutions, such as a university hospital, results (outcomes) were disappointing in many cases. Thus, various types of cases with this morbidity are included in this category by necessity as more definitive sub-groupings remain to be defined. Defining sub-groups and clinical guidelines for the different sub-groups is an important task awaiting the Japan Prosthodontic Society. Clearly, there is a need for the Society to investigate and examine clinical material in an ongoing and continuous

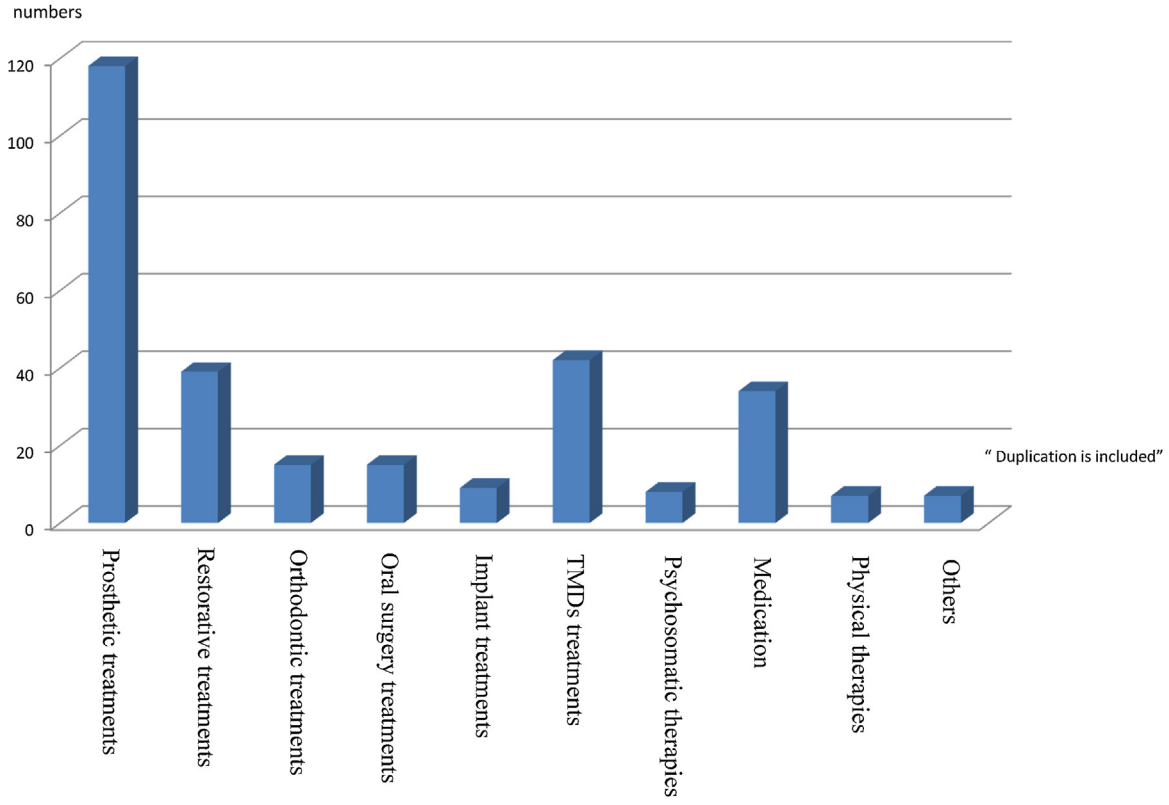

Fig. 4 – Treatments. TMD: temporomandibular disorder; TCH: tooth-contacting habit.

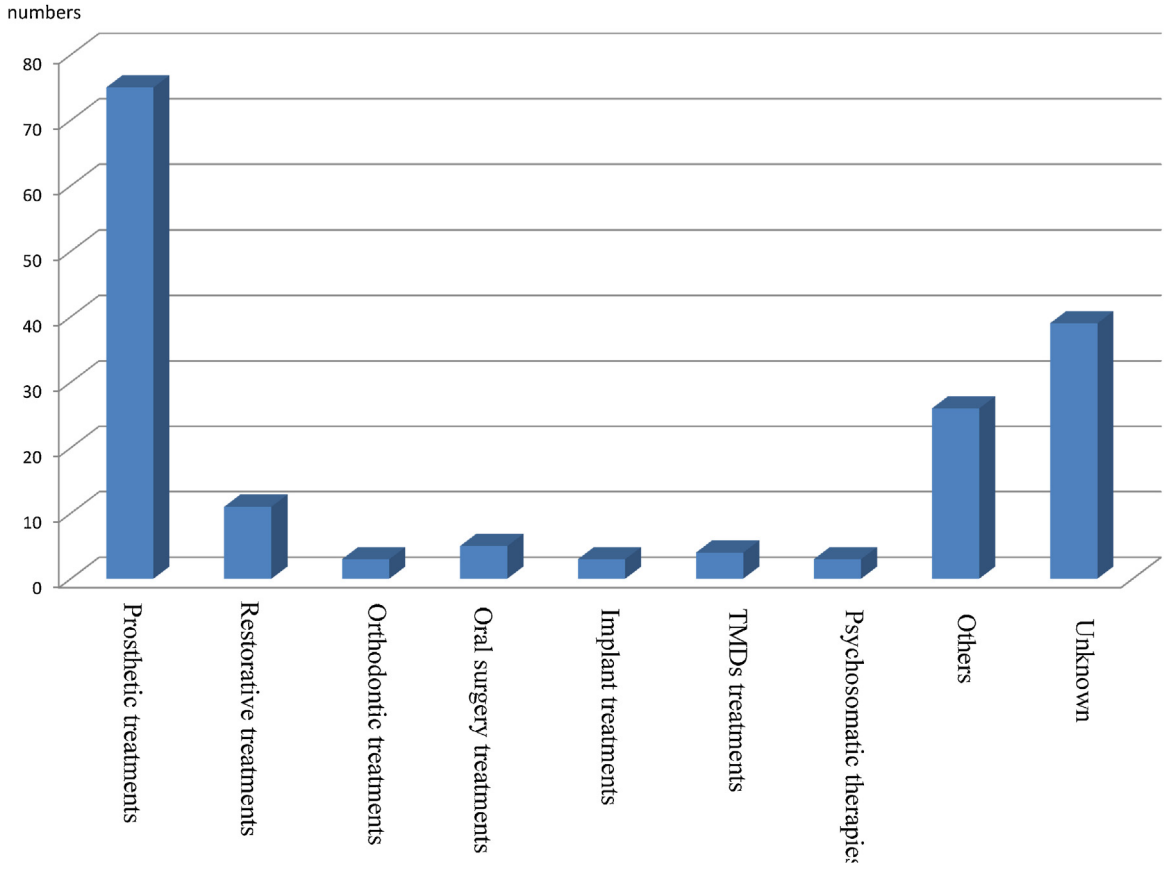

Fig. 5 – Reasons for symptoms, whether proved or not proved.

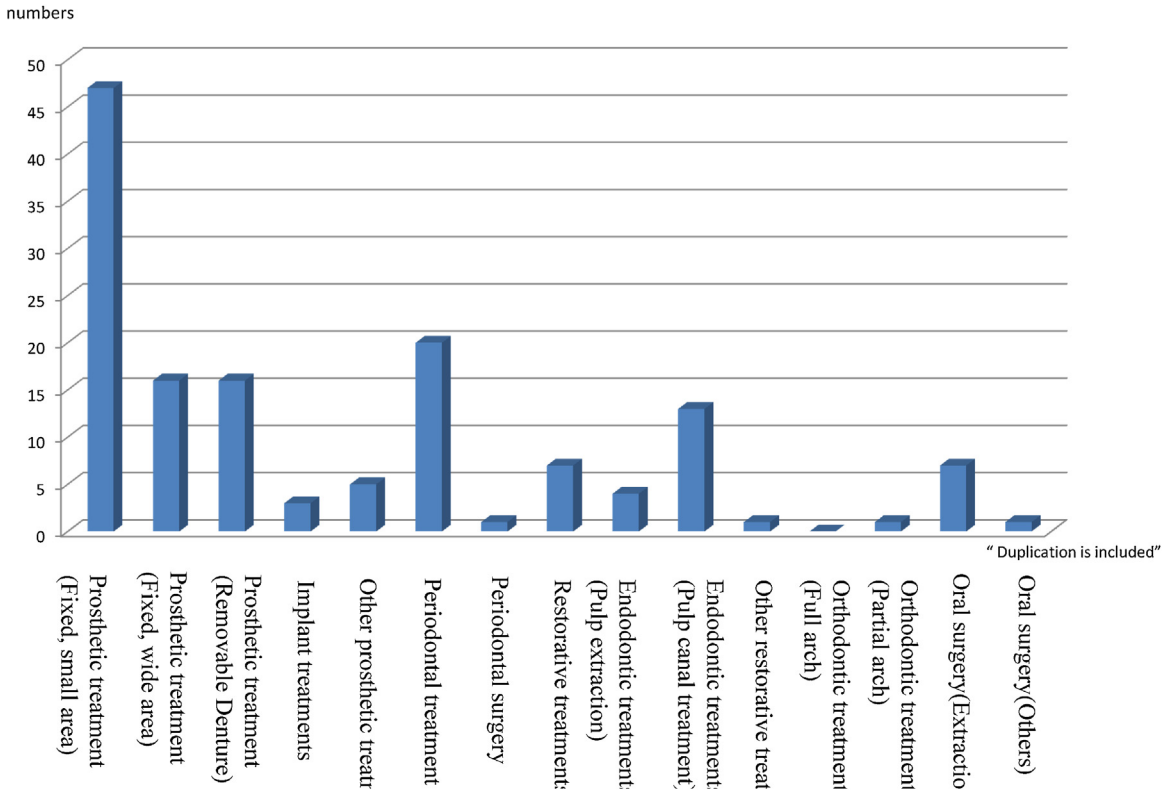

Fig. 6 – Treatment 1 (prosthetic, restorative, orthodontic, oral surgery).

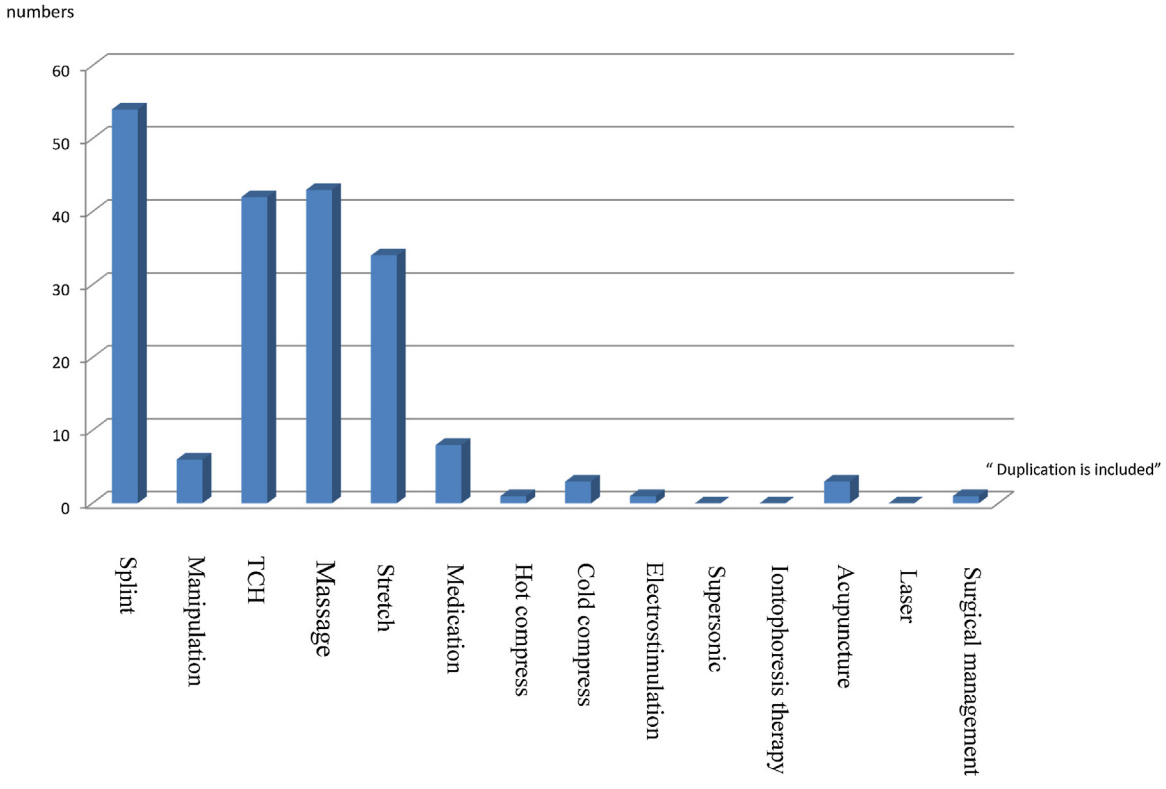

Fig. 7 – Treatment 2 (treatments for TMDs).

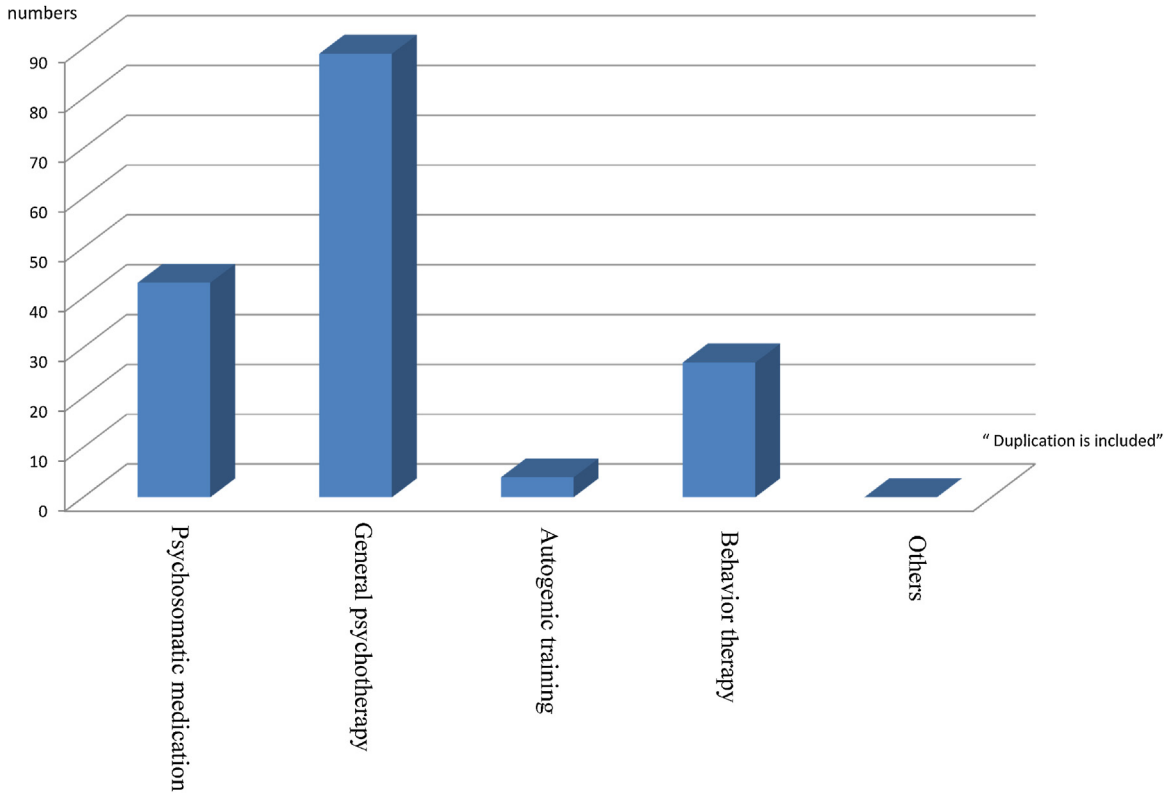

Fig. 8 – Treatment 3 (psychosomatic therapies).

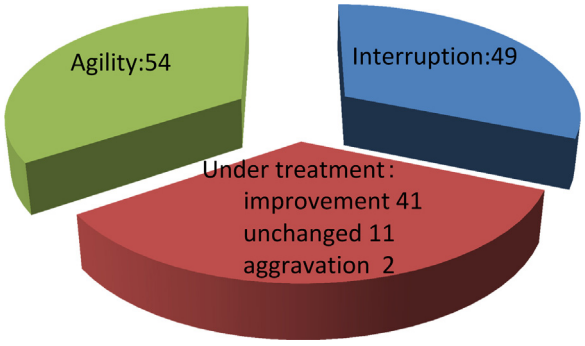

Fig. 9 – Gross results (outcomes).

manner with the goal of establishing diagnostic and treatment methods to alleviate patient concerns and improve treatment outcomes.

5. Conclusions and outlook

The occlusal discomfort condition is defined by the Japan Prosthodontic Society as the "occlusal discomfort syndrome in a broad sense." It is proposed when occlusal discomfort syndrome clearly is not due to occlusal disharmony, it be called "occlusal discomfort syndrome in a narrow sense."

The task force of the Japan Prosthodontic Society that participated in this study, consisting of specialists from fields relevant to this condition, hereby names this disorder as "occlusal discomfort syndrome." The final target—yet to be achieved—is to divide this disease into manageable groups and create clinical practice guidelines for diagnosis and treatment. Ideally, methods to prevent occlusal discomfort syndrome will be developed.

Conflict of interest

There is no conflict of interest that we should disclose.

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