Department of Dentistry

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General Summary

1. linical studies of temporomandibular disorders
We continued our studies of screening questionnaires and evaluation of quality of life in patients with temporomandibular disorders (TMDs).
2. Anatomical studies of the temporomandibular joint of marsupials
We continued our anatomical and histological examinations of the temporomandibular joint (TMJ) and articular disk in Mammalia.
3. Clinical studies of obstructive sleep apnea/hypopnea syndrome
We studied evidence of fatty metamorphosis in the lingual muscles using computed tomographic (CT) images of patients with suspected obstructive sleep apnea/hypopnea syndrome (OSA/HS). We compared CT with cephalometric radiography for evaluating measurements of OSA/HS and report that we examined the difference.
4. Clinical studies of perioperative oral management
We reported the present situation of perioperative oral management and also investigated the effects of perioperative oral management on the length of intensive care unit (ICU) stay and the length of the postoperative hospital stay.
5. Clinical studies of occlusal discomfort
We gathered data and evaluated the conditions associated with patients with occlusal discomfort at multiple institutions.

Research Activities

Clinical studies of TMDs
1. Examination of personal computer operating time and clinical background factors of patients with TMDs at general clinical offices in metropolitan Tokyo
We developed a test for screening for TMDs and reported on the relationship between the development of TMDs and personal computer (PC) operating time with the cooperation of the Tokyo Dental Association in 2011. In the present study, we examined the differences in the relationships of PC operating time and the TMD prevalence between 2 groups. We classified the subjects into 2 groups: a 2007 + 2009 group whose data were previously reported and a 2012 + 2013 group whose data were prereported. The PC operating time was higher in the 2012 + 2013 group, but the TMD prevalence rate did not differ significantly between the groups. The mean age did not differ significantly between the 2007 + 2009 group (34.3 years) and the 2012 + 2013 group (35.3 years). The mean PC operating time was significantly greater in the 2012 + 2013 group (7.3 hours) than in the 2012 + 2013 group (4.2 hours). On the other hand, the groups did not differ significantly in sleeping hours, hours until sleeping after coming home, or commute time

extended. The association of prevalence rates of TMDs and sleeping hours, PC operating time were no statistically significant; therefore, we suspect that guidelines for visual display terminal work were observed and that the sleep situation might have been improved. We believe that investigates should include the PC environment, namely visual display terminal work environment, and the sleep situation.

2. Evaluation of therapeutic effects using the limitation of daily functions questionnaire in patients with TMDs

This study evaluated the pain-related limitations in daily functions before and after treatment in patients with TMDs by using the limitations in daily functions TMDs questionnaire (LDF-TMDQ). The relationship between improvements in LDF-TMDQ scores and improvements in other variables was analyzed by means of structural equation modeling. The LDF-TMDQ is suitable for evaluating the therapeutic effects of TMDs because changes in the scores were proportional to therapy-induced improvements in mouth-opening range, pain intensity, and chewing difficulty.

Anatomical studies of TMJ of marsupials

1. Absence of the articular disk in the monotreme TMJ

This study investigated the morphological characteristics of the TMJ in monotremes through anatomical and radiological examinations. We reconfirmed the absence of the articular disk in the TMJ of the platypus and echidna after a unique report in 1900. Current anatomical and radiological findings indicate that mastication occurs by a combination of lateral and vertical jaw movements in the platypus and involuntary vertical jaw movement accompanied by thrusting of the tongue in the echidna.

Clinical studies of OSA/HA

1. The influence of fatty changes in lingual muscles and body mass index on the apnea hypopnea index

It has recently been postulated that a change in muscle function is associated with the etiology of OSA. Saito and colleagues have previously reported the effect of obesity on the properties of the lingual muscles (genioglossus and geniohyoid) in rats (Arch Oral Biol (2010; 55(10): 803-808). However, based on previous images, fat to muscle metamorphosis has not been shown in humans. Here, we show evidence of fatty metamorphosis in the lingual muscles using CT images of patients with suspected OSA. The subjects were 62 patients (47 men, 15 women) with suspected OSA who visited the Tsurumi University School of Dental Medicine from November 2007 through October 2011. Subjects underwent CT evaluations at the image diagnosis department of the hospital. Sex, age, body mass index (BMI), and apnea hypopnea index (AHI) were recorded for each patient. Inferior airway space and the total value of length and width of the inferior airway space (TIAS) were also measured. The degree of fat-to-muscle metamorphosis was measured with CT. Values were quantified and compared statistically.

Consistent with the report of Saito et al, we showed evidence of fatty metamorphosis of lingual muscles of humans with effects of the TIAS and AHI.

2. Examination about the evaluation of maxillofacial form and soft tissue form in sleep apnea syndrome

Cephalometric analysis has been said to be more effective for evaluating sleep apnea syndrome. However, cephalometric analysis insufficiently evaluates soft tissue. On the other hand, CT is performed with the patient in the supine position. Some reports have compared CT with cephalometric radiography, but the evaluations, such as detection powers, are not accomplished. We inspected sample size and detection power afterwards. We compared CT with cephalometric radiography regarding the evaluation measurements of sleep apnea syndrome.
The detection power was 1.0 at sample size 385 (Gpower). Bone form measurements differed significantly between cephalometric radiography and CT. However, we judged no clinical difference because the difference was all less than 1 degree. In the soft-tissue form, CT measurements (distance from the mandibular plane to the hypoid bone, posterior airway space, and distance between the posterior nasal spine and the tip of the soft palate) significantly showed small values. The measurements in cephalometric radiography and CT did not have a clinical difference in the bone form, and there was an important clinical difference in the soft-tissue form.

Clinical studies of perioperative oral management
1. Current and future status of perioperative oral management
Perioperative oral management was announced by revision of the medical treatment fees in 2012, and we care for patients actively. We performed research to clarify the situation of perioperative oral management.
The subjects were patients who had undergone organ transplants, marrow transplants, cardiac surgeries, chemotherapies, radiation therapies, or malignant surgeries of the head and neck, respiratory organs, or digestive organs under general anesthesia. We created an anonymous database to examine dental treatment regimens, departments that request patients, and periods between the first dental examination and the first treatment of primary diseases. We then compared the results in the first year with those in the second year. The number of patients who require perioperative oral management has been steadily increasing, and patients from the departments of otorhinolaryngology, hematology, oncology, and cardiac surgery account for 80% of the all patients. The problems are not enough for time of dental treatment. Patients usually do not understand the importance of oral healthcare before their treatment and operation. We introduce the importance of perioperative oral management to medical departments and nurses in our hospital.
2. The cooperation with cardiac surgery in our hospital under perioperative oral management
We have attempted to facilitate cooperation between medicine and dentistry by using a schedule we developed of medical examination incorporated with dental treatment during a preoperative examination, a request form for dental treatment and other fields, and a pamphlet recommending dental treatment during a preoperative period. In the prevent study, we reported the present situation of perioperative oral management in cases of cardiac surgical procedures and also investigated the effects of perioperative oral management on the lengths of ICU stays and postoperative hospital stays. Although no significant difference in the length of ICU stays was found, the results showed a significant difference in the length of postoperative hospital stays.

Comprehensive dental care support during the preoperative period in perioperative oral management is believed to help shorten the postoperative hospital stay; our study had a similar result. To provide enough preoperative oral care, cooperation should be facilitated between medicine and dentistry and early dental intervention should be encouraged. Future studies will need to examine the effectiveness of dental care support based on detailed clinical assessments of patients' background factors, such as complications and surgical methods.

Clinical studies of occlusal discomfort

1. A multi-institution investigation of the status of patients who complain of occlusal discomfort

We gathered data and evaluated the conditions associated with patients who have occlusal discomfort at multiple institutions. The patients were 143 women and 37 men with a median age of 55.0 years. The most common chief complaint was contact of the intercuspal position. Although the site of occlusal discomfort was often the molars, the site could also be the incisors. Additionally, occlusal discomfort was experienced in various locations, including one side or both sides, and many patients felt discomfort in the full dental arch. Although occlusal discomfort was often caused by metallic prostheses, such discomfort was also present in natural teeth. The most common treatment was previously prosthetic dental care. Although the sex and median age of patients were the same as those in previous reports, the duration of illness varied. The patients experienced occlusal discomfort in treated teeth and also in natural teeth in various locations.

Publications

Nishiyama A*[1]*, Kuruma E, Hayashi K, Tsukagoshi K*[1]*, Kino K*[1]*, Sugisaki M (*[1]Tokyo Med Dent Univ).*** Evaluation of therapeutic effects using the limitation of daily functions questionnaire in patients with temporomandibular disorders. *Oral Health Dent Manag*. 2014; **13:** 982-6.