

## Department of Dentistry

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### General Summary

1. Clinical studies of temporomandibular disorders (TMDs)
2. Anatomical studies of the temporomandibular joint (TMJ) of marsupials
3. Clinical studies of perioperative oral management

### Research Activities

#### *Clinical studies of TMDs*

1. Effects of personal-computer operating guidelines on the prevalence of TMDs at general clinical offices in metropolitan Tokyo

We developed a test for screening for TMDs (2007). In a previous study, we found a significant relationship between the prevalence of TMDs and personal-computer operating time in female subjects. Following this study, we gave guidelines concerning visual display terminal (VDT) operation to members of the Tokyo Dental Association who did dental checkups. These members then taught the guidelines to patients who underwent dental checkups. We performed a study to examine the effects of the VDT operation guidelines on the prevalence of TMDs among subjects who participated in dental checkups of female office workers in the Tokyo metropolitan area. We classified the subjects into 2 groups: 79 subjects who were patients before the guidelines had been developed (from 2007) and 223 subjects to whom the guidelines were presented (56 subjects from 2012 and 167 subjects from 2013). Between these groups we examined differences in the effects of VDT operating time on the prevalence of TMD. The personal-computer operating times were significantly greater in guideline-presented subjects (mean, 8.0 hours; 25th and 75th percentiles, 6.0 and 8.0 hours) than in pre-guideline subjects (mean, 2.0 hours; 25th and 75th percentiles, 0.0 hour and 5.0 hours). The results suggest that that VDT guidance is useful for decreasing the risk of TMDs and that research on contributing factors for TMDs should be continued.

2. TMJ dislocation observed in children

The mandibular condyle loses its normal relative position and becomes dislocated. The condition often occurs in elderly patients and rarely occurs in children. However, TMJ dislocation occurs in children most often because of falls or other types of trauma. In many patients, such as patients who present with incomplete dislocation, the dislocation naturally repositions when the mouth is held widely open for crying. For this reason, encouraging the child to cry to induce reduction may be an effective treatment method with manipulative reduction. Ensuring compliance in children with limited mouth opening is difficult, and immobilization devices might affect jaw growth; therefore, long-term follow up of mandibular development and morphology is important.

*Anatomical studies of the TMJ of marsupials*

## 1. Morphological characteristics of the TMJ in the pouch young of the Tasmanian devil

We recently reported the absence of the articular disk, which is a constant structure in mammals, in the TMJ of the adult Tasmanian devil. However, whether the articular disk disappears when the animal grows was unknown. The aim of this study was to determine with histological examination whether the articular disk is present in the TMJ of the pouch young animal. The TMJ of the fresh cadaver of a pouch young animal, whose crown-rump length was 43 mm, was examined with microscopy and microcomputed tomography. The pouch young TMJ was morphologically confirmed to lack an articular disk. This finding suggests that the articular disk of the Tasmanian devil is naturally absent. The high-cell-density fibrous tissue on the condylar surface apparently does not differentiate into the articular disk but develops into the thick mature fibrous layer covering the condyle which was previously observed in the adult Tasmanian devil.

*Clinical studies of perioperative oral management*

## 1. Intervention with perioperative oral management

Perioperative oral management became covered by insurance with the revision of medical fees in 2012. On the basis of our previous results, our department has adopted measures to increase the rate and advance the period of dental service use. The subjects for the study were 605 patients who underwent surgery for malignant tumors in the craniocervical region, respiratory or digestive system, or other parts of the body under general anesthesia, cardiac surgery, organ or bone marrow transplantation, chemotherapy, or radiotherapy within the 1-year period from April 2014 through March 2015. The referring department, the primary disease and its treatment, and the period between the initial consultation and primary disease treatment were compared with data obtained during April 2012 through March 2014. Furthermore, adverse events in cases of oral or hematogenous infection were statistically examined. The number of patients treated in our department had increased yearly, by 311 from the 2012 fiscal year. Adverse events were observed more frequently among patients undergoing chemotherapy and patients with reduced immunity. Perioperative oral management before treatment of the primary disease was not possible in 26.4% (28 of 106) of patients but was performed in a significantly lower percentage of patients (7.2%, 36 of 499 patients) ( $p < 0.01$ ). Preoperative dental intervention was effective for preventing complications in patients targeted for perioperative oral management, particularly those with an increased risk of reduced immunity. Thus, pre-treatment dental intervention might be important for patients undergoing chemotherapy or steroid therapy.

## 2. Perioperative oral function management

We examined the performance of perioperative oral function management. The subjects for the study were patients for whom perioperative oral function management was requested in the Department of Dentistry of Daisan Hospital during the period from January 2012 to May 2015. Most of the requests were related to chemotherapy or radiotherapy. Perioperative oral function management led to shorten stays in the hospital and the intensive care unit and to fewer cases of postoperative aspiration pneumonia and ventilator-associated pneumonia.

**Publications**

**Hayashi K, Sugisaki M, Kino K<sup>1</sup>, Ishikawa T<sup>1</sup>, Kawashima S<sup>2</sup>, Amemiya T<sup>2</sup> ( <sup>1</sup>Tokyo Med Dent Univ, <sup>2</sup>Nihon Univ).** Morphological characteristics of the temporomandibular joint in the pouch young of the Tasmanian devil. *Anat Histol Embryol.* 2015; **44**: 157-60.

**Ikai A, Suzuki S, Hayashi K.** A case of ameloblastoma with extensive pulmonary metastasis survived for 14 years without treatment of the lung. *J Oral Maxillofac Surg Med Pathol.* 2016; **28**: 138-42.