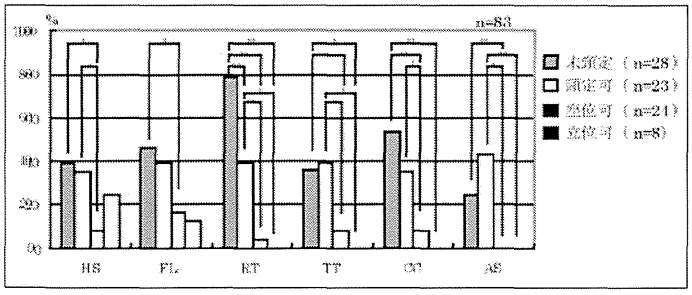

図2　脳性麻痺児における粗大運動発達程度別の摂食・嚥下障害の症状の出現率

管依存症」[12]、十分な栄養が経管から入るために経口から摂取した食物を嚥下しようとしない場合、嚥下機能が未発達な時期に経口からの無理な摂取によってむせや嘔吐などを繰り返した経験と推察される拒食、などに注意が必要である。

・**経管依存症**の場合は、過敏が強く、口腔内に食物を入れることさえ拒否され、機能検査が不可能な場合も多い。検査が可能な場合には、嚥下造影検査では機能が発揮されるにもかかわらず、チューブを指差して注入を要求し続けるなどの状態がみられる。

・**先天性食道閉鎖症**などは、出生直後の口腔咽頭領域の形態の異常や機能の遅れが認められないことが多いが、哺乳経験もほとんどないままに経管栄養となり、継続して経管のみによる栄養摂取の場合には、口腔咽頭領域の個々の動きが改善されても、口からの摂取経験がないために、口腔咽頭領域の触覚過敏によるムセや嘔吐など拒否が強く表出される。このような不快症状に加えて摂食時にどのように口腔・咽頭・喉頭部を動かすかの協調を経験(学ぶ)することができていないために、経口からの摂取が進まない場合も多くみられる[13]。

原疾患による長期の経管栄養の持続は、原疾患が改善されても、経管に固執して経口摂取を拒否する経管依存症状を呈する子どもも多い。このような小児の摂食・嚥下障害の障害特徴は、器質的な異常と機能的な発達遅滞に加えて、精神心理的な要因の関与が大きいことにある。対応としては持続的な脱感作などにより拒否を弱め、食事を受容できるような行動療法が必要となる。

機能の発達程度にかかわらず、摂食拒否が強い場合には、時として経口からの無理強いがみられるが、精神的な虐待なども疑われる場合もあることから、症状の注意深い観察評価と対応が望まれる。

4) 知的障害による摂食・嚥下障害とその対応

知的障害の摂食・嚥下障害は、摂食に関わる神経や筋に機能不全の原因があるのではなく、摂食時にどのように口唇・舌・顎などを協調して動かすことで目的とした摂食動作ができるかを学ぶ途上にあると考えられる。1～3歳の知的障害が主である幼児65名の摂食機能障害の初診時の症状と粗大運動発達程度との関連から、CP児に比較して、摂食機能の障害症状と粗大運動発達程度に関連が弱いとの報告[9]がある。発達期の知的障害児への摂食・嚥下障害における摂食機能療法では、誤嚥窒息などの予防を含めた直接訓練による食物処理に最適な口唇・舌・顎などの協調運動の訓練が対応の中心となる。

5) 広範性発達障害(PDD)による摂食・嚥下障害とその対応

自閉症スペクトラムの小児には、口いっぱいに食物を詰め込む、よく噛まないで丸飲みするなどの先行期や準備期・口腔期の障害がみられ、誤嚥や窒息の原因となることも多い。篠崎ら[14]は自閉症スペクトラムの幼児128名の調査から、その原因の多くが先行期障害であると報告している。また、この疾患に多くみられる摂取食物の極端な偏りは、栄養の偏りや丸呑みなどの準備期障害の原因ともなっているが、それまで食べていたものを拒否して食べられなくなる食品が非常に多くなる時期が2歳過ぎで、逆に4歳過ぎるとそれまで食べなかった多くの食物を食べるようになる場合が多いとも報告している。これらの疾患の特徴の一つである摂取食物の極端な偏りも、発育と共に大きな変化がみられ、家庭や療育担当者がその対応に苦慮されているところであるが、先行期障害である詰め込みや口腔期障害の丸呑みなどの機能症状についても発達変化が推察され、発育変化の予後を判断しながら、無理のない適切な臨床対応が望まれるところである。

【4. 嚥下障害の診断】

嚥下障害の診断法には、嚥下造影検査(VF)、嚥下内視鏡検査(VE)が有効であるが、これらの嚥下障害の検査では小児の協力が必要なため他の診断法に頼らざるを得ない場合が多い。比較的容易に対応可能な診断法としては、フードテスト、頸部聴診法など[4]がある。

1) フードテスト：プリンなどのテスト食を用いて嚥下後の状態の変化及びテスト食の口腔内残留程度から嚥下障害の程度を5段階に評価する[3]。

2) 頸部聴診法：食塊を嚥下する際に咽頭部で生じる嚥下音と嚥下前後の呼気音を頸部から聴診する。聴診部位は、甲状軟骨側面の皮膚上で最も呼気音が聴診しやすい部位が適当である。1)、2) の検査は併用する場合が多い。

【5. 小児の嚥下障害における栄養評価とその対応】

嚥下障害の小児における栄養必要量の推定は重要であるが、基礎代謝量とエネルギー消費量の算出は容易ではない。年齢や身長、体重から推定した基礎代謝量では多くの場合で誤差が大きく、日常生活内容に疾患や病態など個々の特徴を考慮して評価することが必要となる。

嚥下障害のあるCPの小児などでは、年齢、体重などが同程度でも筋緊張、不随意運動、努力性呼吸、咳き込み、などの症状の軽重や頻度によってエネルギー消費量は大きく異なる。栄養必要量を推定するための確立された方法はない現状では、身長、体重から推定される基礎代謝をもとに種々の活動量などを考慮して基礎代謝量の1.5倍前後から開始し、個々の症例毎に調整していく方法[15]がとられることも多い。

また経管栄養で摂食・嚥下リハビリテーションを行いながら経口摂取量を増加していく場合には、関節訓練によるエネルギー消費量、直接訓練による経口摂取の量などを考慮した経管からの栄養量、水分量の考慮も必要である。

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LETTER TO THE EDITOR

Antibiotic sensitivity of bacteria on the oral mucosa after hematopoietic cell transplantation

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We reported recently that bacterial substitution of mainly coagulase-negative staphylococci (CoNS) for streptococci occurred frequently on the oral buccal mucosa after hematopoietic cell transplantation (HCT), and other bacterial species not usually found in the normal flora were also identified [1]. We also reported that multidrug-resistant opportunistic bacteria appearing in the gingiva may be involved in fatal sepsis [2]. These observations prompted an interest in the antibiotic sensitivity of bacteria after HCT, which may explain the bacterial substitution on oral mucosa after HCT. Therefore, we performed a pilot study to determine the antibiotic sensitivity of bacteria on the oral mucosa after HCT.

We examined the antibiotic sensitivity of bacteria detected after HCT, focusing on the period from day 0 to 13, when the severity of clinically evident mucosal damage generally peaks and can cause bacteremia via the oral mucosa [3–5]. A total of nine consecutive patients (M, 4; F, 5; 47.3±11.0 years) receiving HCT at Okayama University Hospital were enrolled in this study. The diseases in these nine patients were as follows: acute myelogenous leukemia (n=3), myelodysplastic syndrome (n=1), and malignant lymphoma (n=5). Autologous HCT, conventional allogeneic HCT, and reduced-intensity HCT were administered to two (M, 2; F, 0; average, 61.0 years), five (M, 0; F, 5; 39.4±7.7 years), and two (M, 2; F, 0; average, 53.5 years) patients, respectively. Informed consent for examination of oral bacteria was obtained from each subject, and the Ethical Committee of Okayama University Graduate School of Medicine, Dentistry, and Pharmaceutical Sciences approved this study (no. 263). General infection control and oral management were performed as described in our previous report [1]. Briefly, fluoroquinolone for prophylaxis against bacterial infection was administered orally. Neutropenic fever was managed according to the guidelines of Hughes et al. [6]. A fourth-generation cephalosporin (e.g., cefepime) or carbapenem (e.g., meropenem) was administered intravenously as empirical antibiotic therapy.

Buccal mucosal swab samples were obtained from each patient twice with a 1-week interval from day 0 to +13. Samples were obtained about 2 h after breakfast by swabbing from the whole surface of the buccal mucosa. All samples were plated onto agar plates under aerobic conditions, and two to five major colonies that were visibly different from each other were collected. A total of 67 colonies were collected from nine HCT patients. Collected colonies were subjected to microbial identification and antibiotic sensitivity test. Identification of colonies thus obtained was performed using rapid ID 32 STREP API®, rapid ID 32 E API®, or ID 32 GN API® identification kits (Japan bioMérieux, Tokyo, Japan) according to the manufacturer's instructions. Due to the laboratory's capacity, almost all bacterial identification was limited to the genus level. Antibiotic sensitivity test was performed by the broth microdilution method, and the minimum inhibitory concentration was determined. Definitions of susceptibility, intermediate resistance, and resistance were made according to the National Committee for Clinical Laboratory Standards susceptibility testing guidelines for bacterial species.

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Abbreviations for antibiotics are as follows: PCG, benzylpenicillin; ABPC, amoxicillin; MPIPC, mecillinam; CVA/AMPC, clavulanate/amoxicillin; CCL, cefaclor; CDTR, cefditoren; CFPM, cefepime; CEZ, Cefazolin; CTM, cefotiam; CTX, cefotaxime; CZOP, ceftizoxime; CPR, cefpirome; FMOX, flomoxef; IPM/CS, imipenem/cilastatin; MEPM, meropenem; GM, gentamicin; CAM, clarithromycin; CLDM, clindamycin; MINO, minocycline; CP, chloramphenicol; and LVFX, levofloxacin.

A total of 38 *Streptococcus* spp. colonies were identified and subjected to sensitivity test for the following antibiotics: PCG, ABPC, CCL, CDTR, CFPM, CTM, CTX, CZOP, CPR, IPM/CS, MEPM, CAM, CLDM, MINO, CP, and LVFX. Of detected streptococcal colonies, 7.9–42.1 % were resistant or showed intermediate resistance to penicillins (PCG, ABPC) and cephems (CCL, CDTR, CFPM, CTM, CTX, CZOP, and CPR). Furthermore, 28.9–55.2 % of these colonies were also resistant or showed intermediate resistance to macrolides (CAM, CLDM). A total of nine CoNS spp. colonies were identified and subjected to sensitivity test for the following antibiotics: PCG, MPIPC, ABPC, CCL, CFPM, CEZ, CTM, CZOP, FMOX, IPM/CS, CVA/AMPC, and FOM. All of the CoNS detected after HCT showed resistance or intermediate resistance to CFPM (100 %), which was our first-choice antibiotic in empirical antibiotic therapy. CoNS also showed high degrees of resistance to penicillins (55.6–100 %), e.g., PCG, MPIPC, and ABPC. A total of two colonies of *Staphylococcus aureus* were identified and subjected to sensitivity testing; both colonies were methicillin-resistant *S. aureus* (MRSA). Sensitivity was limited to ABK, VCM, and TEIC only. One colony of *Pseudomonas* spp. was subjected to sensitivity test for the following antibiotics: ABPC, PIPC, CCL, CFPM, CEZ, CTM, CZOP, CAZ, CMZ, LMOX, IPM/CS, MEPM, AZT, GM, and AMK. This colony was resistant or showed intermediate resistance to ABPC, CCL, CFPM, CEZ, CTM, CMZ, LMOX, and AZT. This *Pseudomonas* spp. colony was sensitive to PIPC, CZOP, CAZ, IPM/CS, MEPM, GM, and AMK. Other bacteria identified were as follows: *Neisseria* spp. (n=9), *Corynebacterium* spp. (n=5), *Enterococcus* spp. (n=3), and *Haemophilus parainfluenzae* (n=2). All colonies were sensitive to most of the antibiotics tested.

The results of the present study indicated that there were many antibiotic-resistant bacteria in the oral cavity after HCT, especially during the period in which the severity of oral mucositis reached its peak. Oral mucositis could be a potential route of antibiotic-resistant infections. In our previous study, bacterial substitution mainly of CoNS for streptococci occurred frequently on the oral buccal mucosa after HCT [1]. High levels of antibiotic resistance in CoNS may explain bacterial substitution of CoNS for streptococci. On the other hand, streptococci with antibiotic resistance and/or intermediate resistance have also been detected at relatively high frequencies. Note that two colonies of MRSA and one colony of *Pseudomonas* spp. resistant to many types of antibiotic were detected. These observations are a reminder of the risk of appearance of MRSA and/or multidrug-resistant *Pseudomonas aeruginosa* (MDRP), and the oral cavity may be a site of MRSA and/or MDRP growth. Further studies regarding the association with bacteremia/sepsis by DNA fingerprinting will yield additional insight into the clinical relevance of the present findings. Examination of specific patient-related- or therapy-related risk factors for developing resistance may contribute to determination of personalized importance of oral care before and after HCT.

In conclusion, many antibiotic-resistant bacteria were detected in the oral cavity after HCT, especially during the period in which the severity of oral mucositis reaches its peak.

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Videoendoscopic assessment of swallowing function to predict the future incidence of pneumonia of the elderly

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SUMMARY **The purpose of the present study was to examine what dysphagic signs identified by videoendoscopy (VE) could predict the incidence of pneumonia and body weight loss in elderly patients living in nursing homes. This study was performed at six nursing care facilities in Japan from March 2007 to February 2009. The 148 subjects (85·1 ± 8·0 years, male/female: 43/105) were evaluated for their feeding and swallowing movements by clinical and VE examinations during the consumption of a regular meal. The VE examination items included the existence/absence of pharyngeal residue, laryngeal penetration, and aspiration of food and saliva. The patients were followed-up for 3 months with individualized feeding therapy based on the results of the clinical/VE examination at baseline, and the incidence of pneumonia was examined as the primary outcome. In patients without pneumonia, the body weight change was also measured as a secondary outcome. The risk factors for pneumonia and body weight loss (of 3% or more) were identified among the clinical/VE examination items by a Cox proportional hazard analysis. Even with elaborative feeding therapy, 12 (8·1%) of the 148 patients developed pneumonia during the 3 months follow-up period. The existence of signs of 'silent aspiration of saliva' or 'aspiration of saliva' detected by VE examination was a significant risk factor for both pneumonia and a body weight loss of 3% or more. This study shows that 'aspiration of saliva' detected by VE is a significant risk factor for both pneumonia and body weight loss in elderly patients living in nursing homes.**

KEYWORDS: **videoendoscopy, aspiration-related pneumonia, dysphagia, aspiration of saliva, body weight loss**

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Introduction

Dependent elderly patients are at high risk for feeding and swallowing disorders as a consequence of disease and/or aging (1–3). Studies done in long-term care facilities have shown a prevalence of such disorders ranging from 60% to 87% (4, 5). Among the various disorders, special attention has been given to dysphagia because it may lead to malnutrition with immune system compromise, dehydration, asphyxiation, or even aspiration pneumonia (1–3). Moreover, a previous follow-up study of patients with dysphagia in such care facilities revealed an incidence of pneumonia of 43% and a mortality rate of 45% at 1 year following the detection of their swallowing disorder (6). Therefore, clinicians should be able to identify dysphagia in order to predict those patients at risk of developing complications secondary to dysphagia, as well as to develop and implement a rehabilitation plan stressing prevention and compensation.

Videofluorography (VF) has been regarded as the most popular adjunctive instrument for the

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examination of patients with suspected oropharyngeal dysphagia. Previous studies have examined the use of VF as a means to predict those at risk for dysphagia and its complications (7, 8). For instance, Mann *et al.* (7) found that the single best independent predictor for chest infection following an acute stroke was a delayed or absent swallowing response in acute stroke patients. Teraoka *et al.* (8) found that the single best predictor of oral intake in post-stroke patients with dysphagia was the presence of aspiration detected by VF assessment. Nevertheless, one major disadvantage of VF for patients living in long-term care facilities is that the patients need to be transported to a hospital setting, which is sometimes inconvenient or may disorientate the patient because of the sudden change in the environment. Other disadvantages are related to the exposure to x-ray radiation and the risk of aspiration during VF assessment in some patients with severe physical or mental alterations (9).

On the other hand, videoendoscopic (VE) examination of swallowing allows for easy assessment of patients in their usual environment because the instrument is portable and does not require a radiology suite (10). Additionally, although VE is most useful for the examination of the integrity of the upper airway before and after a swallow response, it enables the evaluation of the tongue function during mastication and deglutition, as well as the detection of aspiration by the objective visualization of the airway (11, 12).

Videoendoscopic examination has been shown to successfully estimate the existence of accumulated oropharyngeal secretions, thus resulting in excellent prediction of aspiration (13, 14). In addition, Ota *et al.* (15) reported that the secretion scale based on the VE examination is a useful evaluation tool for predicting not only aspiration, but also pneumonia, in acute-phase dysphagic stroke patients. Furthermore, Link *et al.* (16) reported that there was a relationship between the VE-based pooled hypopharyngeal secretions, laryngeal penetration, aspiration and recurrent pneumonia with neurological disorders in pediatric patients. It is therefore evident that VE is the best tool to examine pooled hypopharyngeal secretions, laryngeal penetration, and aspiration. Therefore, even though the agreement rate between the VF and VE findings on dysphagia was shown to be high (90%) (17), VE examinations are becoming increasingly popular for examining the aspiration of saliva and food at the bedside and in long-term care facilities (17, 18).

In a prospective study with acute stroke patients, Lim *et al.* (19) found a strong association between aspiration detected by VE and the development of aspiration pneumonia. However, the predictors of aspiration pneumonia in dependent elderly patients with dysphagia in long-term care facilities have not been sufficiently investigated using VE. Therefore, the purpose of this prospective cohort study was to investigate whether the dysphagic signs identified by VE were risk factors for pneumonia and body weight loss in patients living in long-term care facilities.

Materials and methods

Subjects

Six hundred and forty-seven inpatients were initially identified from six nursing care facilities in Tokyo, Japan from March 2007 to February 2009 (Fig. 1). All patients, except for 28 subjects who were tube-fed, were screened for dysphagia by a check-list given to the patient's caregiver. The screening check-list contained 11 items: pooling of food, uncomfortable feeling in the throat, previous history of asphyxiation, previous history of aspiration, previous history of pneumonia, increased phlegm production, choking on saliva, choking on food, choking after a meal, prolongation of their eating time, and insufficient intake. The 171 patients who had at least one item checked positively by the caregiver were suspected to have dysphagia and comprised the intended sample population. However, 23 patients were excluded because of cognitive failure or refusal to participate in this study. Consequently, the final study population consisted of 148 patients (male/female: 43/105) with a mean age of 85·1 ± 8·0 years and an age range from 59 to 100 years. The protocol for this study was approved by the Ethics Committee of the Nippon Dental University School of Life Dentistry at Tokyo (#08-10).

Baseline measurements and feeding therapy

At the baseline measurement, a medical doctor assessed the patients' general health condition, and none of the patients fulfilled the Mann's criteria (7) for a diagnosis of pneumonia, that is, the presence of at least three of the following signs and symptoms: fever >38 °C, productive cough with sputum, tachypnea higher than 22 breaths per minute, inspiratory crackles,

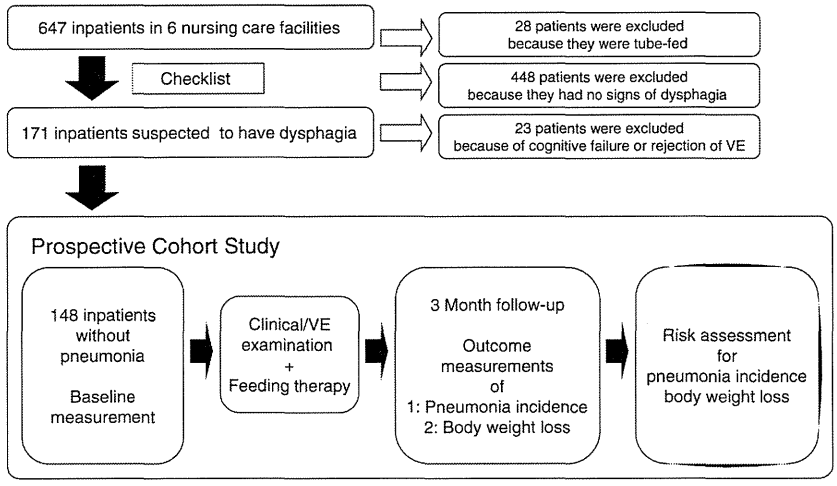

Fig. 1. The sampling process used for this study.

an abnormal chest x-ray, or positive gram staining and cultures.

All included subjects had their eating ability and dysphagic signs and symptoms evaluated clinically according to a clinical examination form regarding the signs and symptoms of dysphagia (spilling food, pooling food, oral food residue after a swallow, inability to open the mouth, choking/coughing, increased phlegm while eating, dyspnea, wet hoarseness, other), the hand and mouth coordination during the meal (feeding posture, prolongation of eating time) and the caregiver's technique used for feeding assistance.

In addition, each patient's swallowing function was examined by VE, which consisted of a flexible endoscope (ENF-V2*) connected to a high-intensity compact light source (CLH-SC*) and a video recorder (OTV-SC*).The endoscope was passed transnasally to the hypopharynx at a vantage point that provided a full view of the laryngeal vestibule, and was kept in place for a period of 10–15 min to assess the patient's eating ability, or saliva swallows when the patient was not consuming a meal. The patients were examined in their usual eating position, that is, the ambulatory patients were seating in the upright position, while the bed-bound patients were sitting on a bed. All swallows were recorded on videotapes for the further analyses by experienced physicians familiar with endoscopic swallowing studies and who were blinded to the intentions of the study. Each patient's video-recording data were reviewed for the presence or absence of pharyngeal residue, and penetration and aspiration of food or saliva. 'Penetration' was defined as a passage of material into the larynx that does not pass below the vocal folds, while 'aspiration' was defined as passage of material below the level of the vocal folds. In cases where the aspiration of food or saliva did not induce a cough, it was defined as 'silent aspiration' according to the criteria proposed by Rosenbek *et al.* (1996) (20). To assess the inter-rater reliability of the swallowing evaluations, the three investigators who were unaware of the original evaluation results, separately reviewed a random 10% sample of these evaluations. The overall agreement rate between investigators was substantial according to the Landis and Koch criteria (21) (kappa coefficient = 0·660).

On the basis of these aforementioned evaluations, the patients received various feeding therapies (22) during the follow-up period, for example, confirmation of feeding conditions [76 patients (51·4%) of 148 patients, multiple answers possible], appropriate feeding assistance [69 patients (46·6%)], food modification [32 patients (21·6%)], modification in feeding posture [19 patients (12·8%)] and modification in food intake [four patients (2·0%)] for 3 months. Food modification involved changing the dietary consistency. We modified the food and liquid texture individually according to the National Dysphagia Diet recommendations (23). Food intake and feeding assistance required modifications to accommodate the individual needs of the patients, such as changes in the rate and amount of the food consumed, appropriate utensils and the

*Olympus Corporation, Tokyo, Japan.

method used for self-feeding (22). Modifications in the feeding posture were applied in order to maximize the physical capabilities and improve swallowing, and involved strategies such as head-turn or chin-tuck maneuvers or whole body-positioning strategies including the patient tilting to the side or back, side-lying, or maintaining an upright posture (22). All patients received oral health care after every meal by the caregiver who was instructed once a week about the oral care procedures by a dental hygienist. Caregivers cleaned each patient's oral cavity using a toothbrush for approximately 5 min after each meal. The brushing was carried out as usual for daily tooth brushing without paste, and included brushing the palatal and mandibular mucosa and tongue dorsum. Dentures were also cleaned with a denture brush every day.

The 3 month follow-up and outcome measurement

The first outcome variable after 3 months of follow-up was the incidence of pneumonia diagnosed according to the same criteria applied at the baseline measurement. Once the patients received a diagnosis of pneumonia, they were sent to a local hospital for treatment, without exception. Consequently, their oral feeding was prohibited to prevent further aspiration pneumonia and their body weight typically decreased as a result (24). The incidence of pneumonia and body weight loss were therefore strongly correlated after the development of pneumonia. Thus, when pneumonia was identified, follow-up measurements of the patient's body weight were terminated.

The second outcome variable during the follow-up period was a change in body weight demonstrated by monthly measurements. Since there is a close relationship between pneumonia and body weight loss, the incidence of body weight loss of 3% or more was examined in patients who had not been diagnosed with pneumonia during the 3 months of follow-up. Once the patients developed a body weight loss of 3% or more, the patients received some form of nutrition therapy, and thus, the follow-up observation was terminated.

Statistical analysis

A survival curve of the patients who had not been diagnosed with pneumonia was drawn for a Kaplan–Meier analysis. According to the presence/absence of pneumonia during the 3 months of follow-up, we divided the final sample population into pneumonia and non-pneumonia sub-groups, and performed a *t*-test, chi-square analysis or Fisher's exact test to analyse the differences between the two groups.

Similarly, a survival curve of those patients who had not lost more than 3% of their body weight was drawn for a Kaplan–Meier analysis (outcome event: the incidence of body weight loss of 3% or more). Differences between the weight gain/no change sub-group (body weight gain, or a small weight loss of no more than 3% of the initial body weight) and the weight loss group (body weight loss of 3% or more (10, 25)) were analysed with the same statistical tests utilized for the incidence of pneumonia.

Additionally, a Cox proportional hazard analysis was performed to identify the risk factors for the incidence of pneumonia and the body weight loss of 3% or more. The analysed predictors were age, self-feeding ability, the Barthel activities of daily living (ADL) index, a body mass index (BMI) lower than 18·5, pharyngeal residue, laryngeal penetration, aspiration of food and aspiration of saliva. Regarding the aspiration of food or saliva, the data were handled as ordinal variables (negative, positive, positive as silent aspiration). The data were analyzed with the Statistical Package for the Social Sciences software program (SPSS version 15.0†). A *P*-value <0·05 was considered to be statistically significant.

Results

Baseline condition of the patients

Examination of the medical conditions of the initial 148 patients showed the presence of a prior stroke in 83 (comorbidity admitted) (56·1%), dementia in 74 (50·0%), Parkinson's disease in 10 (6·8%), cardiovascular disease in 10 (6·8%), hypertension in 8 (5·4%), previous pneumonia in 5 (3·4%), diabetes mellitus in 3 (2·0%), fractures in 3 (2·0%) and other comorbidities in 14 patients (9·5%).

The clinical examination regarding the eating ability and signs and symptoms of dysphagia before the VE evaluation showed choking/coughing in 110 out of 148 patients (multiple choice admitted), pooling of food in 28, prolongation of the eating time in nine, inability to

†SPSS Japan Inc., Tokyo, Japan.

open the mouth in two, and spilling of food in one patient.

The VE evaluation detected pharyngeal residue in 97 (65·5%) out of the 148 patients, laryngeal penetration in 67 (45·3%), aspiration of food in 41 (27·7%), silent aspiration of food in 19 (12·8%), aspiration of saliva in 8 (5·41%), and silent aspiration of saliva in 10 (6·76%) patients (Table 1).

Risk factors for pneumonia and body weight loss

Even with elaborative feeding therapy, during the 3 months of follow-up after the baseline measurement, 12 (8·1%) of the 148 patients developed pneumonia (Fig. 2). In addition, among the non-pneumonia patients, 90 (66·2%) of them presented with weight gain, no change or weight loss of 3% or less (weight gain/no change group), while 46 patients (33·8%) lost 3% or more of their body weight (weight loss group) (Fig. 3).

The differences between the pneumonia and non-pneumonia groups concerning the clinical/demographic data and the dysphagic signs detected by VE are shown in Table 1. The unpaired *t*-test showed that there were no significant differences in the patient age ($P = 0·505$), gender ($P = 0·244$), self-feeding ability ($P = 0·419$), number of patients with a BMI lower than 18·5 ($P = 0·190$), and the Barthel Index ($P = 0·060$) between the subjects with and without pneumonia. On the other hand, there was a significant difference in the frequency of 'aspiration of saliva' between the pneumonia and non-pneumonia patients ($P = 0·026$). In contrast, a comparison between the body weight gain/no change and body weight loss groups showed that there were no significant differences concerning any of the analysed variables (Table 2).

The results of the Cox proportional hazard analysis revealed that a sign of the 'aspiration of saliva' detected by VE was a significant risk factor for pneumonia (Table 3) and for a body weight loss of 3% or more (Table 4).

Discussions

The presence of aspiration-related pneumonia is known to be associated with a high mortality rate in the elderly. Patients in nursing homes may have a higher incidence of pneumonia because of their multiple underlying diseases, which may lead to immunosuppression, excessive use of medications, generalized decreased functional status, as well as factors related to malfunctioning of the masticatory and orophraryngeal systems and inadequate oral care. In particular, dysphagia is known to be strongly associated with aspiration pneumonia. Teramoto *et al.* (26). reported

Table 1. The relationship between the clinical/VE signs and the incidence of pneumonia

	Total subjects	No pneumonia ($n = 136$)	Pneumonia ($n = 12$)	*P*-value
Age (mean ± s.d.)	148	85·0 ± 8·1	86·8 ± 5·4	0·505†
Male/female	148	38/98	5/7	0·244††
Self-feeding (yes/no)	148	47/89	5/7	0·419††
Barthel Index (mean ± s.d.)	116*	13·1 ± 18·1	7·2 ± 7·12	0·060†
BMI < 18·5**	118**	43/110 (39·1%)	5/8 (62·5%)	0·190††
Pharyngeal residue	148	88 (64·7%)	9 (75·0%)	0·354††
Laryngeal penetration	148	62 (45·6%)	5 (41·7%)	0·519††
Aspiration of food	148			0·326††
Silent aspiration	19	19	0	
Aspiration	41	38	3	
NA	88	79	9	
Aspiration of saliva	148			0·026††
Silent aspiration	10	7	3	
Aspiration	8	7	1	
NA	130	122	8	

*Of 116 patients, 107 were in the no pneumonia group and nine were in the pneumonia group.
**Of 118 patients, 110 were in the no pneumonia group and eight were in the pneumonia group.
†*T*-test.
††Chi-square test.

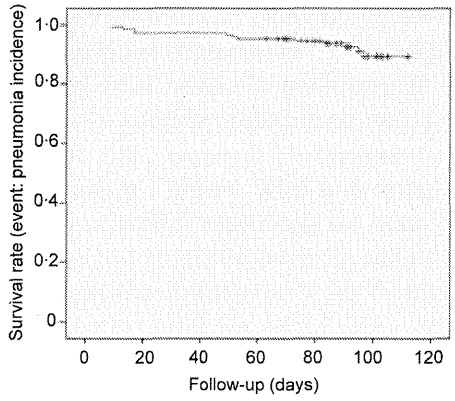

Fig. 2. The survival curve of the patients who did not suffer from pneumonia. The survival curve was drawn for a Kaplan–Meier analysis (outcome event: incidence of pneumonia).

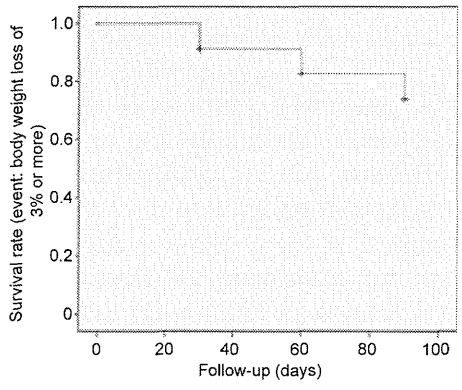

Fig. 3. The survival curve of the patients who did not suffer from a body weight loss of 3% or more. The survival curve was drawn for a Kaplan–Meier analysis (outcome event: incidence of body weight loss of 3% or more).

that 70% of the pneumonia in the elderly occurred due to aspiration, and Yamaya *et al.* (27). reported a high prevalence of silent aspiration in older persons leading to the deterioration of swallowing function due to cerebrovascular disease. In a previous study, Doggett *et al.* (28) estimated that approximately 43–54% of stroke patients have dysphagia and aspiration of food or saliva, and that approximately 37% of these patients would develop aspiration-related pneumonia.

In this present study, penetration and aspiration (apparent or silent) was observed in 67 subjects (45·2%) and 60 subjects (40·5%), respectively. The prevalence of aspiration found in this investigation was relatively high compared to previous studies utilizing VE examination (29%) (29), but was similar to the range observed in a previous review article where it was reported to occur in 15–39% of subacute dysphagic stroke patients (30). According to this review, the exact prevalence of aspiration remains unknown because of the differences in the size and methodology used in the existing studies.

The incidence of pneumonia was 12 (8·1%) among the 148 subjects (Table 1), which is in accordance with the study by Lim *et al.* (19), who reported that five patients (10%) developed pneumonia during their inpatient stay, and that all of them were at risk of aspiration of saliva or food as determined by a VE examination. On the other hand, Croghan *et al.* (6) reported that 55% of their nursing home patients presented with aspiration on VF examination, and 43% developed pneumonia.

One possible reason for such a discrepancy in the association of pneumonia and aspiration or penetration could be due to the technique (VE vs. VF) utilized to assess the swallowing disorders. Although a number of methods have been used to detect the symptoms of dysphagia, it is very difficult to evaluate 'silent aspiration of saliva' with a bedside clinical assessment alone, because it has been shown that it is missed in up to 40% of the patients aspirating silently (31, 32). At present, VF and VE are regarded as the best methods to evaluate swallowing function. In particular, VF has been used as a gold standard to evaluate swallowing because it can detect aspiration. However, it may not be as accurate in identifying 'silent aspiration of saliva', as compared to VE, because the latter enables direct visualization of the aspiration of saliva (18, 33, 34). Kelly *et al.* (35) reported that penetration and aspiration are perceived more sensitively in VE images than in VF images of the same swallows. It is also well known that VE can identify the microaspiration and aspiration of secretions with a high reliability, whereas VF cannot (36, 37). Additional advantages of VE are related to its application. Inpatients may become agitated or fatigued in the radiology suite or may not respond well to the taste of barium-coated boluses, or may even reject the radiation exposure, limiting the applications of VF. Videoendoscopy allows the patient's examination to be performed regardless of his/her altered mental status or immobility (38). Finally, Wu *et al.* (39) stated that VE is conclusively a safe, more efficient and sensitive method than VF for evaluating swallowing.

Another reason for the discrepancy could be the effect of the feeding therapy provided in this study, which could have reduced the symptoms of dysphagia,

Table 2. The relationship between the clinical/VE signs and the change in body weight

	Total subjects	Gain/no change (n = 90)	Weight loss (n = 46)	P-value
Age (mean ± s.d.)	136	84·6 ± 8·0	85·7 ± 8·6	0·464†
Male/female	136	25/65	13/33	0·553††
Self-feeding (yes/no)	136	29/61	16/30	0·454††
Barthel Index (mean ± s.d.)	107*	14·9 ± 18·7	9·6 ± 17·0	0·163†
BMI < 18·5	110**	30/74 (40·5%)	13/36 (36·1%)	0·655††
Pharyngeal residue	136	61 (67·8%)	27 (58·7%)	0·294††
Laryngeal penetration	136	44 (48·9%)	18 (39·1%)	0·2797††
Aspiration of food	136			0·975††
Silent aspiration	19	13	6	
Aspiration	38	25	13	
No aspiration	79	52	27	
Aspiration of saliva	136			0·342††
Silent aspiration	7	4	3	
Aspiration	7	3	4	
No aspiration	122	83	39	

Weight loss was diagnosed as the loss of 3% or more of the body weight from the baseline measurement.
*Of the 107 patients, 72 were in the gain/no change group and 35 were in the weight loss group.
**Of the 110 patients, 74 were in the gain/no change group and 36 were in the weight loss group.
†T-test.
††Chi-square test.

Table 3. The results of the Cox proportional hazard analysis for the possible predictors of the incidence of pneumonia

Predictors	B	P-value	HR	95% CI
Age	0·011	0·860	1·011	0·900–1·135
Self-feeding	0·105	0·909	1·111	0·182–6·785
Barthel Index	−0·010	0·769	0·990	0·927–1·057
BMI < 18·5	2·064	0·070	7·874	0·844–73·440
Pharyngeal residue	−0·621	0·615	0·537	0·048–6·067
Laryngeal penetration	0·571	0·642	1·771	0·160–19·644
Aspiration of food (negative/positive/ positive with SA)	−0·216	0·830	0·805	0·112–5·794
Aspiration of saliva (negative/positive/ positive with SA)	1·290	0·025	3·634	1·174–11·242

HR, hazard ratio; CI, confidence interval; SA, silent aspiration.

Table 4. The results of the Cox proportional hazard analysis for the possible predictors of a body weight loss of 3% or more

Predictors	B	P-value	HR	95% CI
Age	0·019	0·448	1·019	0·971–1·070
Self-feeding	0·530	0·228	1·698	0·718–4·014
Barthel Index	0·000	0·992	1·000	0·976–1·025
BMI < 18·5	0·859	0·032	2·362	1·074–5·191
Pharyngeal residue	−0·060	0·896	0·942	0·381–2·325
Laryngeal penetration	0·019	0·970	1·019	0·374–2·780
Aspiration of food (negative/positive/ positive with SA)	−0·203	0·569	0·816	0·405–1·644
Aspiration of saliva (negative/positive/ positive with SA)	1·186	0·000	3·275	1·828–5·866

HR, hazard ratio; CI, confidence interval; SA, silent aspiration.

pharyngeal residue, laryngeal penetration, and aspiration of food, as demonstrated by the fact that 66% of the subjects were able to increase their body weight or keep the body weight loss to within 3%. Nevertheless, a detailed analysis of the effectiveness of feeding therapy on the reduction of the symptoms of dysphagia could not be performed, because it was beyond the scope of this study.

Additionally, the differences in the target populations and their respective medical conditions could also have affected the overall incidence of pneumonia. This study gathered a heterogeneous patient population consisting of patients presenting with well-known disorders/diseases associated with the symptoms of dysphagia (e.g. stroke, Parkinson's disease, dementia) as well as other non-debilitating diseases/disorders (hypertension, fractures). On the other hand, a strong point in this study was the inclusion of a relatively high number of subjects from six nursing care facilities, which was large compared to other follow-up studies. Therefore,

the incidence of pneumonia may have been relatively lower in such a large heterogeneous study sample.

Regarding the risk factors associated with the development of pneumonia, some of them were reported to be age, primary disease, consciousness disorders, nutritional status, poor ADL, poor oral status, and swallowing dysfunction (40, 41). In the present study, among the analysed predictors, the 'aspiration of saliva' detected by VE was the only significant risk factor for pneumonia. In cases of bad oral health, saliva contains numerous bacteria. Therefore, patients with silent aspiration of saliva (without a cough reflex) are aspirating bacteria, which may be the main factor responsible for increasing the risk of pneumonia.

Additionally, even with the elaborative feeding therapy provided in this study, the control of aspiration of saliva or silent aspiration of saliva was generally difficult. In the present study, there was also a tendency for there to be a higher incidence of pneumonia in poor ADL patients. Langmore *et al.* (42) also reported that severely dependent functional status was an especially potent predictor of aspiration pneumonia. Riquelme *et al.* (40) reported that there was a significant relationship between the ADL and mortality rate. It was also observed that patients with a BMI < 18·5 had a higher tendency to develop pneumonia ($P = 0{\cdot}070$) compared with those with a poor ADL ($P = 0{\cdot}769$). It is well known that a lower nutrition condition affects the host immunological function, thus making the subjects more susceptible to pneumonia (43).

On the other hand, aspiration of saliva was also detected as a significant risk factor for body weight loss in this study. This finding could be explained by the possible presence of subclinical aspiration-related pneumonia in those subjects with a body weight loss of 3% or more.

The overall findings in this study demonstrated that it is still very difficult to prevent aspiration of saliva even if physicians provide elaborative feeding therapy and even if patients do not eat and drink anything through the mouth. Effective strategies to prevent the silent aspiration of saliva will therefore be an important target for future research.

Conclusion

The results of this study showed that, even with elaborative feeding therapy, 'aspiration of saliva' as detected by videoendoscopic examination was found to be a significant risk factor for pneumonia and a body weight loss of 3% or more in elderly patients living in nursing homes.

Acknowledgments

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短　報

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気管挿管における口腔内偶発症防止対策の必要性

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はじめに

本院に2008年9月から組織された周術期管理センターには歯科スタッフも参画している。その目的の一つは，気管挿管時の歯牙損傷等を予防することである。全身麻酔時の歯牙損傷の発生率は0.1～0.3%と報告されており[1)-3)]，術前の適切な診査で防ぎ得るケースがあると考えられる。

本センターの対象患者は，現在，肺移植手術を除く呼吸器外科手術全例(疾患は肺癌が多くを占める)と，消化管外科の食道癌再建根治術全例で，順次対象科の拡大が予定されている。

本研究では，より安全な周術期管理に資するため，本センターで歯科医師が術前診査をした患者を対象に，気管挿管時の口腔内偶発症防止対策が必要と判断した患者の頻度を調べた。

対象と方法

1) 対象

2008年9月から2009年8月に本院周術期管理センターを受診した全患者163人へ歯科医師の術前診査を推奨した。同意した158人(男性87人，女性71人，中央値64歳，22～86歳)を対象とし，後ろ向き調査を行った。

2) 方法

歯科医師は挿管操作を想定し，上顎前歯部を重点的に診査した。手術時の口腔内偶発症防止対策が必要と判断した患者の頻度および対応内容，そして手術時の口腔内偶発症の発生状況を調べた。

本研究の実施にあたっては，岡山大学大学院医歯薬学総合研究科疫学倫理委員会の承認を得た。

結　果

1) 歯科医師の手術前診査および対応内容

歯科医師の手術前診査の結果，158人中46人に処置が必要と判断された。

処置の内訳をFig. 1に示す。手術時に歯の脱落の危険がある患者は27人存在し，全員にマウスプロテクタが作製された。作製の型取りで歯の脱落の危険があった2人には，当該歯の抜歯後に残存歯の保護のためマウスプロテクタが作製された。歯の脱落の危険はないが，充填物や冠の脱離防止あるいは破損防止が必要と判断された患者は19人存在した。これらの全ての患者にもマウスプロテクタが作製された。

2) 手術時の口腔内偶発症の発生

歯あるいは冠の破損・脱離・落下事例はなかった。対象期間の当初に，プロテクタの適合が悪く挿管中に度々外れ，麻酔管理に支障をきたした症例が2例あっ

Necessity of measures for preventing intraoral complications during orotracheal intubation

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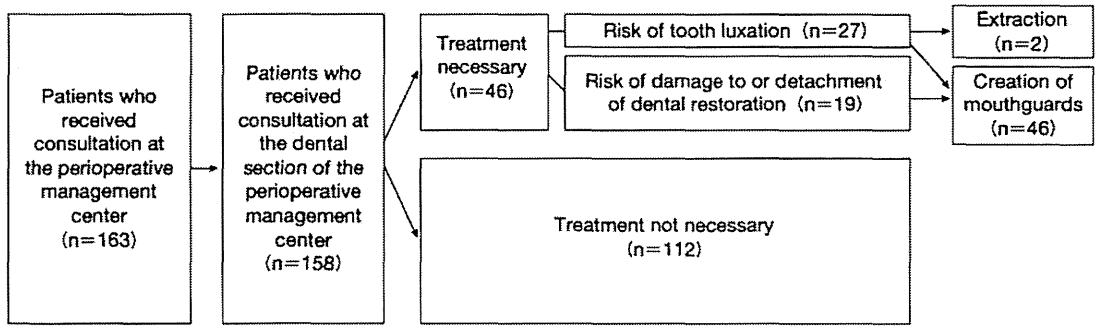

Fig. 1 Disposition of patients thought to require some form of treatment to prevent dental injury during orotracheal intubation based on preoperative tests by dentists

たが，使用材料等の改良で以後発生はなかった。抜歯の治癒不全等，歯科処置に起因する手術延期等の影響はなかった。

考　察

気管挿管時の歯の脱落防止対策として，抜歯，動揺歯の固定処置，そしてマウスプロテクタの作製等があるが，今回，多くの症例でマウスプロテクタの使用を選択した。抜歯を行った場合，万一治癒不全が起こると手術の延期を余儀なくされる可能性がある。化学療法等の術後併用予定例では，歯性感染巣の徹底除去を目的として抜歯等を積極的に行うことがあったが，歯牙損傷防止の目的だけであれば，マウスプロテクタを作製して残存歯の機能保全を図ったケースが多かったと思われる。

歯科医師が慎重に対応した結果，口腔内偶発症防止対策が行われた患者の割合が高くなった可能性がある。一方，本研究の対象患者の年齢層は比較的高い。さらに肺癌および食道癌の危険因子に喫煙があり，加齢と喫煙は歯周病の危険因子でもある[4]ことから，本研究の患者群は歯周病が重症化し，動揺歯が多かったのかもしれない。肺癌，食道癌患者は気管挿管における口腔内偶発症防止対策の必要性が高い患者群である可能性がある。他疾患群ではこの割合が異なるとも考えられ，将来の調査課題であると思われた。

結　論

歯科医師の術前診査で，約3割の患者に手術時の口腔内偶発症防止対策が必要と判断された。気管挿管における口腔内偶発症防止対策の必要性を示唆した。

本論文の一部内容は，第37回日本集中治療医学会学術集会（2010年，広島）で発表した。

本研究は，平成21年度岡山大学次世代研究者・異分野研究連携育成支援事業および厚生労働省平成23年度チーム医療実証事業の一環として行われた。

本稿の全ての著者には規定された利益相反はない。

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原　著

岡山大学病院歯科系診療科等が医科系診療科等から受けた院内紹介とそれに対する初動対応 —平成22年度を対象とした実態調査—

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Survey of first dental examination system for patients referred from medicine to dentistry in Okayama University Hospital - 2010 report

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（平成24年6月12日受付）

緒　言

質が高く，安心・安全な医療を求める患者・家族の声が高まる中，「チーム医療」が我が国の医療の在り方を変え得るキーワードとして注目を集めている。厚生労働省は「チーム医療の推進に関する検討会」で，患者・家族とともに質の高い医療を実現するためには，チームとしての方針の下，包括的指示を活用しつつ各医療スタッフの専門性に積極的に委ねるとともに，医療スタッフ間の連携・補完を一層進めることが重要であると論じている。さらに，院内横断的な取組として，医師・歯科医師を中心に，複数の医療スタッフが連携して患者の治療に当たる医療チームの組織の重要性を論じている[1]。

岡山大学病院歯科系診療科等は，医科—歯科連携を強化しチーム医療を促進するため，医科系診療科等からの院内紹介による初診患者への対応について検討を重ねてきた。歯科の初診患者は歯科総合診断室で各科協力の下，総合的に初期判断を下され，最も適切な科に割り振られてきた。しかし，近年，医科系診療科等側から，何科宛に紹介すればいいのかわからない，治療に関する問い合わせ先，予約取得の依頼先等がわからない，診療科によって対応が違う，窓口を一本化してほしい，といった意見・要望が寄せられるようになった[2]。旧来からの歯科総合診断室による初診患者への対応体制は主として外来患者を念頭に置き運用されてきたものであり，医科系診療科等からの院内紹介患者に対する対応について検討が必要となった。

このような背景から，平成20年に歯科総合診断室運営委員会は院内紹介対応マニュアル（医科入院中の歯科外来受診）を策定し，運用が始まった[2]。むし歯科，歯周科，補綴科（クラウン・ブリッジ）（現　クラウンブリッジ補綴科），補綴科（咬合・義歯）（現　咬合・義歯補綴科），予防歯科の5診療科が担当曜日を決め，院内紹介受け入れ診療科となり，各科は担当曜日において専門性に関わらず医科系診療科等からの院内紹介に初動対応をする（紹介元診療科が特定の診療科を指定している場合や小児患者を除く）というものである[2]。

さらに平成23年度には，医科系診療科等の診

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療と密接に連携し，医科系診療科等患者の状況に対応した専門的な歯科的支援を行い，併せて歯学の教育及び研究の向上を図ること等を目的として「医療支援歯科治療部」の実質稼働が始まり，専任スタッフが配置された。この治療部は，岡山大学病院の医科—歯科連携における歯科側の窓口・拠点の役割を担う[3,4]。

将来的には医療支援歯科治療部が医科系診療科等からの初動対応を一元化して行う構想となっているが，平成24年度現在，医療支援歯科治療部の対応能力はこの構想を実現するに至っておらず，院内紹介患者に対する対応は医療支援歯科治療部と曜日別院内紹介受入当番診療科による対応の二本立てとなっている。今後の構想を検討するに当たり，医科系診療科等から歯科系診療科等になされる院内紹介患者の実態（数，紹介元診療科など）や紹介患者への対応現況を知る必要がある。

また，平成24年4月になされた平成24年度診療報酬改定では，周術期における口腔機能の管理等，チーム医療の推進が重点課題の一つとなり，本邦における医科—歯科連携の推進が加速されるものと予想される[5]。本院における医科系診療科等から歯科系診療科等への院内紹介の状況を明らかにし発信することは，本邦における病院歯科が医科との連携を構築あるいは推進するに当たって参考となり得る。

本調査研究では，平成22年度を対象とし，1．岡山大学病院歯科系診療科等の初診患者数に占める医科系診療科等からの院内紹介患者の割合，2．歯科系診療科等への院内紹介を行った医科系診療科等とその件数，3．院内医科系診療科等が歯科系診療科等に紹介した際の宛先，および4．具体的な歯科系専門診療科等の名を挙げずになされた医科系診療科等からの院内紹介に対する紹介日の対応状況を調べ，岡山大学病院歯科系診療科等が同院医科系診療科等からの院内紹介に対応するにあたり今後望まれる体制について考察することとした。

対象及び方法

平成22年度に岡山大学病院歯科系診療科等を受診した患者で，初診料が算定された患者を抽出した。抽出された患者を対象に，1．岡山大学病院歯科系診療科等の初診患者数に占める医科系診療科等からの院内紹介患者の割合，2．歯科系診療科等への院内紹介を行った医科系診療科等とその件数，3．院内医科系診療科等が歯科系診療科等に紹介した際の宛先，4．具体的な歯科系専門診療科等の名を挙げずになされた医科系診療科等からの院内紹介に対する初動対応状況を調査した。

結　果

1．岡山大学病院歯科系診療科等の初診患者数に占める医科系診療科等からの院内紹介患者の割合

平成22年度に岡山大学病院歯科系診療科等で初診料を算定した患者件数は9,606件であり，そのうち岡山大学病院医科系診療科等から歯科系診療科等へ紹介された院内紹介患者件数は1,377件であった。初診料が算定された患者の14.3 %は院内紹介によるものであった。

2．歯科系診療科等への院内紹介を行った医科系診療科等とその件数

紹介元の医科系診療科等と各々の紹介件数および年間院内紹介患者数におけるその割合を表1に示す。周術期管理センター（肺移植術を除く呼吸器外科手術および消化管外科の食道手術が対象）からの紹介が最も多く279件（年間院内紹介件数の20.3 %）に及び，耳鼻咽喉科からが140件（年間院内紹介件数の10.2 %），心臓血管外科が87件（年間院内紹介件数の6.3 %），循環器内科が81件（年間院内紹介件数の5.9 %）（循環器系の2診療科で168件（年間院内紹介件数の12.2 %））を占めた。平成22年度に開設されていた医科系診療科（29科）のうち感染症内科，病理診断科を除く27診療科から院内紹介があり，表1に示す件数と割合であった。

3．院内医科系診療科等が歯科系診療科等に紹介した際の宛先

院内医科系診療科等が歯科系診療科等に紹介した際の宛先を表2に示す。具体的な歯科系専門診療科等の名を挙げず，電子カルテの院内紹介テンプレートで「歯科（紹介）」を選択して紹介がなされるケースが最も多く，418件に及び，年間院内紹介件数の30.2 %に上った。具体的に歯科系専門診療科等の名を挙げて紹介されるケースでは，周術期管理センター（歯科部門），口腔外科（再建系），第1総合診療室の順で紹介が多く，こ

表1．紹介元診療科等と紹介件数および年間院内紹介患者数におけるその割合

紹介元診療科等	患者数（人）	割合（%）
周術期管理センター	279	20.3
耳鼻咽喉科	140	10.2
心臓血管外科	87	6.3
循環器内科	81	5.9
神経内科	79	5.7
血液・腫瘍内科	62	4.5
呼吸器・アレルギー内科	56	4.1
消化器内科	55	4.0
腎臓・糖尿病・内分泌内科	54	3.9
脳神経外科	49	3.6
小児科	45	3.3
皮膚科	44	3.2
小児神経科	32	2.3
精神科神経科	32	2.3
消化管外科	31	2.3
リウマチ・膠原病内科	29	2.1
救急科	28	2.0
整形外科	25	1.8
乳腺・内分泌外科	24	1.7
総合診療内科	23	1.7
産科婦人科	22	1.6
泌尿器科	18	1.3
形成外科	15	1.1
呼吸器外科	15	1.1
麻酔科蘇生科	13	0.9
肝胆膵外科	12	0.9
放射線科	10	0.7
眼科	6	0.4
空白	11	0.8
計	1,377	100

れら診療科等への紹介で668件（年間院内紹介件数の48.5％）を占めた。

4．具体的な歯科系専門診療科等の名を挙げずになされた医科系診療科等からの院内紹介に対する紹介日の対応状況

院内紹介状で紹介先歯科系診療科等の指定がなく「歯科（紹介）」あるいは記載なしであった患者（418人）の初動対応状況を表3に示す。曜日割の院内紹介受入当番診療科が初期対応を行ったケースが216件であり，紹介先歯科系診療科等の指定がない紹介のうち51.7%を占めた。総合診断室（予診室）で適切な専門診療科が検討され振分されたケースは104件であり，紹介先歯科系診療科等の指定がない紹介のうち24.9％を占めた。

表2．院内医科系診療科等が歯科系診療科等に紹介した際の宛先

紹介先診療科等	患者数（人）	割合（%）
歯科（紹介）	418	30.4
周術期管理センター（歯科部門）	336	24.4
口腔外科（再建系）	171	12.4
第1総合診療室	161	11.7
歯周科	91	6.6
小児歯科	64	4.6
口腔外科（病態系）	42	3.1
補綴科（咬合・義歯）		
（現　咬合・義歯補綴科）	28	2.0
むし歯科	25	1.8
補綴科（クラウン・ブリッジ）		
（現　クラウンブリッジ補綴科）	20	1.5
予防歯科	7	0.5
矯正歯科	6	0.4
歯科放射線・口腔診断科	1	0.1
歯科麻酔科	1	0.1
総合歯科	1	0.1
空白	5	0.4
	1,377	100

表3．院内紹介状で紹介先歯科系診療科等の指定がなく「歯科（紹介）」あるいは記載なしであった患者の受診診療科決定過程

受診診療科決定過程	患者数（人）	割合（%）
曜日割の院内紹介受入当番診療科が対応した。	216	51.7
総合診断室（予診室）で適切な専門診療科が検討され振分された。	104	24.9
年齢・紹介内容等から専門診療科が明白であり直接該当診療科が対応した。	26	6.2
特定の歯科医師の指名はあり，その歯科医師の所属診療科が初動対応をした。	23	5.5
「歯科（紹介）」として紹介されたが，科等間連携・事前連絡等で紹介先は明らかであり，当該診療科が直接対応した。	17	4.1
午後当番医が対応した。	10	2.6
再来初診患者で，紹介内容が既受診診療科の専門分野と同一であったため，当該診療科が対応した。	9	2.4
その他	2	0.5
不明	11	2.2
	418	100

考　察

岡山大学病院歯科系診療科等は岡山大学歯学部附属病院を前身とし，歯学部を有する大学の特徴を発揮して各専門診療科で専門性の高い高度な歯科医療の提供を行ってきた。一方で，平成22年度に岡山大学病院歯科系診療科等で初診料が算定された患者の14.3%は医科系診療科等からの院内紹介によるものであり，本院歯科系診療科等の役割として医科系診療科等が行う医療に当たり必要不可欠な口腔内の管理を行ったり，医科系診療科等が展開する医療の質を歯科の専門性をもって向上させたりする役割も担っていると考えられた。平成15年に医学部附属病院と歯学部附属病院の統合がなされた後，このような役割が増してきているのかもしれない。

紹介元診療科は，肺移植術を除く呼吸器外科手術および消化管外科の食道手術を対象とする周術期管理センター，耳鼻咽喉科，心臓血管外科，循環器内科の順に多く，口腔が周術期等の術後合併症等の原因となり得る診療科が積極的に歯科系診療科等へ院内紹介を行っていると考えられた。頭頸部あるいはその近傍の手術に際しての術後感染予防対策や口腔機能管理による経口栄養摂取の促進，あるいは口腔内感染巣の遠隔的な感染（心内膜炎，心人工弁感染等）予防対策を求めての紹介と考えられる。周術期管理センター（歯科部門）への紹介は周術期管理センター本部からの紹介数より大幅に多く，周術期管理センター本部が扱い連携している医科の外科系診療科以外にも，周術期管理を要する医科の外科系診療科が独自に周術期管理センター（歯科部門）宛として歯科系診療科等に紹介を行っている実態が明らかとなった。さらに，医科系のほぼ全ての診療科から歯科系診療科等への紹介がなされており，臓器移植医療やがん化学療法等の医療が医科系診療科等で展開されていることからこれらに際しての口腔内への対応が求められたり，様々な医科治療を行う中で口腔内に起こった偶発的な事象への対応も求められているものと考えられる。

医科系診療科等からの院内紹介の過程で，具体的に歯科系診療科等の名を挙げて紹介されるケースは，平成22年度で668件（年間院内紹介件数の48.5 %）であった。医科系診療科等と歯科系診療科等との間で科等間連携関係を結び，効率的な医療の提供を行っていたケースが多いと考えられた。一方，具体的な歯科系診療科等の名を挙げず，電子カルテの院内紹介テンプレートで「歯科（紹介）」を選択して紹介がなされるケースも多く，平成22年度で418件（年間院内紹介件数の30.2 %）に及んでいた。口腔内に起こった偶発的な事象への対応のみではこの件数は多すぎる。前述した科等間連携関係が平成22年度現在でまだないものの，医科系診療科等の治療遂行上，口腔内の管理がルーティンに求められるものがあり，しかしながら医科系診療科等は求める歯科治療を行う歯科系診療科等が不明なため，具体的な歯科系診療科等を指定せずに紹介されているケースが多い可能性がある。

平成20年度から曜日割の院内紹介受入当番診療科体制が運用され始めているが，平成22年度はこの当番診療科が初期対応を行ったケースが216件であった。紹介先歯科系診療科等の指定がない紹介のうち51.7%を占めたことから，この体制は相当に機能したようである。一方，件数からすれば平均して1日1件は曜日割の院内紹介受入当番診療科がその専門性にかかわらず医科系診療科等からの院内紹介に対応している状況である。この理由の一つとして，調査対象とした平成22年度にまだ医療支援歯科治療部は稼働していないことが挙げられる。専門外の診療内容や基礎疾患等のバックグラウンドを把握する労力を考えると，院内紹介受入当番診療科が本来の専門性を発揮するためのマンパワーや時間を奪ってしまっている状況もありそうである。

平成23年度から実質的な稼働をしている医療支援歯科治療部は，院内の医療連携における歯科側の窓口の機能を担うこととなっており，将来的に医科系診療科等からの院内紹介に対して一元化された窓口となる画期的な構想となっている。このことが機能すれば，各歯科系診療科等が院内紹介にかかる初動対応を行うことによる前述の問題が解決され，各々がより専門領域の歯科医療を展開する環境が整うと考えられる。一方，医療支援歯科治療部が岡山大学病院歯科系の初診患者の14.3 %を占める1,377件全てに対応するには相当なマンパワーとハード面での整備が必要となると考えられる。

特殊歯科総合治療部の改組改編後に医療支援歯科治療部が発足した背景から，医療支援歯科治療

部は平成23年度から旧第二総合診療室の3台の歯科用ユニットで稼働を開始した。マンパワーについては，平成23年度の稼働当初は教員が2名(1名は実質上他診療科と兼任）であった。平成24年から，歯科医師は教員が2名，医員および医員（レジデント）が，週4日勤務で1人と換算すると各々1名で，計4名のスタッフとなっている。現状で院内紹介の全ての患者に対応するにはハード面でもマンパワーの面でも不足しており，院内紹介患者に対する初動対応は医療支援歯科治療部と曜日別院内紹介受入当番診療科による対応の二本立てとなっている。平成23年度の医療支援歯科治療部の実質稼働により，医科系診療科等からの院内紹介への初動対応状況がどのように変化しているかを今後の調査課題としたい。平成22年度を対象とした本調査と比較検討することで，医科系診療科等からの院内紹介に一元化して対応する窓口が機能するために必要なハード及びマンパワーがより明確になるものと考えられた。

結　論

平成22年度岡山大学病院歯科系診療科等の初診患者件数のうち，医科系診療科等からの院内紹介患者件数は1,377件で全初診患者の14.3％を占めていた。岡山大学病院歯科系診療科等の役割の一つとして，医科系診療科等からの紹介患者への対応が明らかとなった。一方で平成22年度時点においてなされた医科系診療科等からの院内紹介は特定の歯科系診療科等の記載がないものが418件（年間院内紹介件数の30.2％）に及び，これらに対する受け入れ態勢をわかりやすく効率的にする必要性を示唆した。院内紹介における歯科側の窓口となる医療支援歯科治療部のハードおよびマンパワーの増強の必要性を示唆した。医療支援歯科治療部稼働後の平成23年度の患者を対象にさらなる調査を行い，本調査（平成22年度）と比較検討することで必要なハード及びマンパワーがより明確になるものと考えられた。

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