

EFFECT OF FOOD IMPACTION IN THE INTERPROXIMAL OF IMPLANT SUPPORTED FIXED
RESTORATION TOWARDS ORAL HEALTH RELATED QUALITY OF LIFE



A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Science in Oral and Maxillofacial Surgery

Department of Oral and Maxillofacial Surgery

FACULTY OF DENTISTRY

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 ทันตแพทย์ Oral Impacts on Daily Performance ประเมินผลกระทบของการมีเศษอาหารติดต่อคุณภาพชีวิตของ
 ผู้ป่วยด้วยแบบสอบถาม ประเมินสภาพเนื้อเยื่อปริทันต์รอบรากฟัน/รอบรากฟันเทียมด้วยการตรวจทางคลินิกและ
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ผลการศึกษา: ผู้ป่วย 178 คนได้รับการใส่ครอบฟันบนรากฟันเทียมรากเดียว 286 ซี่ และมีด้านประชิด 410
 ด้าน เข้าร่วมในการศึกษานี้ ผู้ป่วย 134 คนรายงานว่ามีการมีเศษอาหารติดที่รากฟันเทียม และตรวจพบทางคลินิกโดยทันต
 แพทย์ โดยสองในสามของผู้ป่วยได้รับผลกระทบต่อกิจกรรมประจำวันตั้งแต่เล็กน้อยจนถึงรุนแรงโดยเฉพาะการทำความสะอาด
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 ความลึกร่องเหงือกที่ฟันธรรมชาติ การเติมของเหงือกสามเหลี่ยม ($P < 0.05$) นอกจากนี้ยังพบว่าความยาวจุดสัมผัสของ
 ครอบฟันบนรากฟันเทียมกับฟันธรรมชาติ ความยาวจากฐานจุดสัมผัสของครอบฟันบนรากฟันเทียมกับฟันธรรมชาติถึง
 เส้นอ้างอิง ระยะห่างในแนวนอนระหว่างรากฟันเทียมและฟันธรรมชาติ พื้นที่ของช่องว่างด้านประชิดหว่างรากฟันเทียม
 และฟันธรรมชาติ มีความแตกต่างกันระหว่างกลุ่มที่มีเศษอาหารติด และไม่มีเศษอาหารติด อย่างมีนัยสำคัญทางสถิติ
 ($P < 0.05$) การมีเลือดออกจากการตรวจร่องลึกปริทันต์รอบรากฟันเทียมและฟันธรรมชาติ และระดับกระดูกที่รากฟันเทียม
 และฟันธรรมชาติ ระหว่างกลุ่มที่มีเศษอาหารติด และไม่มีเศษอาหารติด พบว่ามีความแตกต่างกันแต่ไม่มีนัยสำคัญทาง
 สถิติ ($P > 0.05$)

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 กับการมีคราบจุลินทรีย์ที่รากฟันเทียม และการเพิ่มความลึกร่องเหงือกที่ฟันธรรมชาติ

สาขาวิชา ศัลยศาสตร์ช่องปากและแม็กซิลโลเฟ ลายมือชื่อนิลิต
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6075845032 : MAJOR ORAL AND MAXILLOFACIAL SURGERY

KEYWORD: Food impaction, Oral health related quality of life, Dental implant, Implant supported single crown, Peri-implant tissue inflammation

Souknilan Chanthasan : EFFECT OF FOOD IMPACTION IN THE INTERPROXIMAL OF IMPLANT SUPPORTED FIXED RESTORATION TOWARDS ORAL HEALTH RELATED QUALITY OF LIFE.

Advisor: Assoc. Prof. KESKANYA SUBBALEKHA, D.D.S., Ph.D. Co-advisor: Assoc. Prof. Pagaporn Pantuwadee Pisarnturakit, D.D.S., M.Sc., Dr.P.H.

Objectives: To investigate the effect of food impaction between dental implant and adjacent teeth to the patients' quality of life and periodontal/peri-implant tissue conditions.

Materials and methods: Patients with implant supported single crown (ISSC) having implant checkup at the Faculty of Dentistry, Chulalongkorn University between July 2019 and July 2020 were recruited. Food impaction was evaluated by either patients' experience or clinical examination by dentist. Self-administrative Oral impacts on Daily Performance questionnaire was used to assess the effect of food impaction to patients' quality of life. Clinical and radiographic examination was performed to evaluate periodontal/peri-implant tissue conditions.

Results: Totally 178 patients with 286 ISSC and 410 proximal spaces, were included in this study. Food impaction was reported by patient and clinically found by dentist in 134 patients which two-third of them were affected in daily activities from minor to severe especially cleaning teeth and eating. Plaque presence at ISSC, pocket depth at adjacent tooth, and fully papilla fill were associated with food impaction at $P\text{-value} < 0.05$. In addition, contact length, contact point level, horizontal implant tooth distance, and embrasure surface area found significant difference between food impaction and no food impaction group ($P\text{-value} < 0.05$). However, there was no significant difference in bleeding on probing at implant and tooth, bone level at implant, and bone level at tooth between food impaction and no food impaction group ($P\text{-value} > 0.05$).

Conclusion: Food impaction in the interproximal of implant supported fixed restoration affected patients' quality of life from minor to severe especially cleaning teeth and eating. In addition, it was also related with plaque presence at ISSC and increase probing depth at adjacent tooth.

Field of Study: Oral and Maxillofacial Surgery Student's Signature

Academic Year: 2020 Advisor's Signature

Co-advisor's Signature

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CHAPTER I

INTRODUCTION

1.1 Background and Rationale

In recent years, dental implant has become more popular and superior treatment option in replacing of missing teeth in partial and fully edentulous patients.(Elani, Starr, Da Silva, & Gallucci, 2018) Implant-supported dental prostheses was reported with high survival rate of 94.6% at the period of 10 years follow up.(Howe, Keys, & Richards, 2019; Moraschini, Poubel, Ferreira, & dos Sp Barboza, 2015) Despite of high success rate and survival rate, dental implant complication is also existed.(Adler, Buhlin, & Jansson, 2020; Kreissl, Gerds, Muche, Heydecke, & Strub, 2007; Papaspyridakos, Chen, Chuang, Weber, & Gallucci, 2012) Peri-implant mucositis and peri-implantitis are known to be biological complication.(Göthberg, Bergendal, & Magnusson, 2003) The major cause is accumulation of plaque and bacteria that will dramatically destroy peri-implant tissues and surrounding bone, subsequent implant loss. In implant- supported single crown, peri-implantitis was reported 9.7% in 5 years follow up period.(Jung et al., 2008) In addition, patient also complaint about food impaction after dental implant treatment.(Wat, Wong, Leung, & Pow, 2011)

Interproximal food impaction is a cause of discomfort feeling, pain, halitosis, interproximal caries, gingivitis, periodontitis and tooth loss.(Hancock, Mayo, Schwab, & Wirthlin, 1980; Hirschfeld, 1930; Jernberg, Bakdash, & Keenan, 1983; Van den Broek, Feenstra, & de Baat, 2007) While food impaction around the implant causes peri-implant tissue inflammation such as edema, bleeding, pain around the peri-implant tissues. It also attributes to halitosis, peri-implant papilla loss, pocket formation, loss of osseointegrated bone, implant mobility, and consequently implant loss.(Byun, Heo, Ahn, & Chang, 2015; Carter & McNamara Jr, 1998; Ioannou et al., 2015). Food impaction is associated with proximal contact loss, location and area of proximal

contact, marginal ridge integrity, plunger cusp mechanisms and proximal papilla deficiency due to gingival recession or periodontal disease.(Byun et al., 2015; Jeong & Chang, 2015; Pang, Suh, Kim, Park, & Jung, 2017; Wong, Wat, Pow, & Leung, 2015) Mesial drift of natural tooth in relation to osseointegration create interproximal contact loss and food impaction consequence.(Heij et al., 2006; Wat et al., 2011) The deficiency of proximal papilla with implant-supported prostheses was claimed to cause lateral food impaction.(Gastaldo, Cury, & Sendyk, 2004) The newly formed embrasure dimensions of implant supported fixed restoration have been a critical concern to dentists regarding periodontal/peri-implant tissue conditions.(Balshi & Wolfinger, 1996; Esposito, Ekkestubbe, & Gröndahl, 1993; Knoernschild & Campbell, 2000). An increase in embrasure surface area was found to have more frequently food impaction between dental implant and adjacent teeth.(Jeong & Chang, 2015)

However, there are still limited studies about the effect of food impaction to the periodontal/peri-implant tissues. In addition, no studies focus on the impact of food impaction to the patients' quality of life. The purpose of the present study were to investigate the effect of food impaction between implant supported single crown and adjacent natural tooth to the patient's quality of life and to compare the periodontal/peri-implant tissue conditions between food impaction and non-food impaction patients.

1.2 Research Questions

1. Does food impaction between implant supported single crown and adjacent teeth affect the patients' quality of life?
2. Are periodontal/peri-implant tissue conditions different between food impaction and non-food impaction patients?

1.3 Research Hypotheses

1. Food impaction between implant supported single crown and adjacent teeth affects the patients' quality of life.
2. Periodontal/peri-implant tissues conditions between food impaction and no food impaction patients are different.

1.4 Research Objectives

1. To evaluate the effect of food impaction between implant supported single crown and adjacent teeth to the patients' quality of life.
2. To compare periodontal/peri-implant tissue conditions between food impaction and no food impaction patients.

1.5 Expected Benefit

The outcomes from this study will help dentists to acknowledge the frequency of food impaction between dental implant and adjacent teeth, and further understand the impact of food impaction on the patients' quality of life and periodontal/ peri-implant tissues. Consequently, dentists can inform patients about food impaction after dental implant treatment and suggest oral hygiene instruction to prevent food impaction and peri-implant disease. These will raise the patients' awareness of the effect of food impaction on peri-implant disease. Finally, dental implant treatment will achieve long term success rate and longevity treatment outcome.

1.6 Conceptual framework

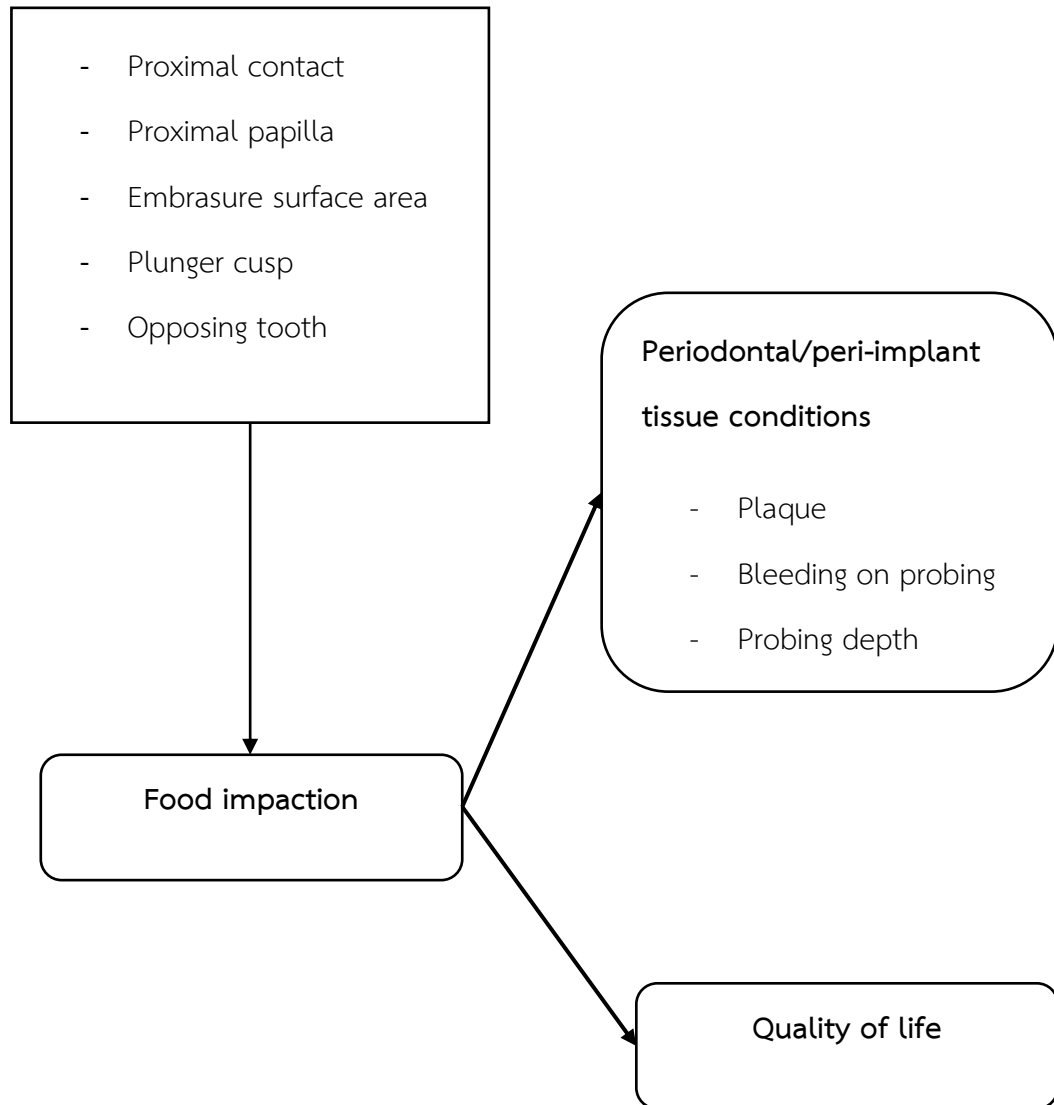


Figure 1: Conceptual framework

CHAPTER II

REVIEW LITERATURE

2.1 Food impaction

The phrase “food impaction” is defined as the forceful wedging of food into the interproximal space vertically by mastication pressure or horizontally by lateral pressure from cheek and tongue.(Linkow, 1962) Location of interproximal contact, open proximal contact, marginal ridge integrity, opposing plunger cusp, attrition, congenital morphology abnormality, extruded tooth, improper restoration, deficiency of interdental papilla are factors associated with food impaction.(Hancock et al., 1980; Hirschfeld, 1930; Jernberg et al., 1983; Kepic & O'Leary, 1978; Tarnow, Magner, & Fletcher, 1992) Impaction of food into interproximal spaces can create a favorable area for bacteria growth and these bacteria toxic products may destroy both soft and hard tissues. Food impaction may cause numerous oral health problems such as halitosis, discomfort feeling, pain, proximal caries, gingivitis, periodontitis, bone resorption and even tooth loss.(Hancock et al., 1980; Hirschfeld, 1930; Larato, 1971; Van den Broek et al., 2007) Similarly, food impaction around dental implant might affect peri-implant tissues leading to peri-implant mucositis, peri-implantitis, marginal bone loss and subsequently implant loss.(Bidra, 2014)

Larato (1971) studied relationship of food impaction to interproximal intrabony lesions in 121 dry skull articulated specimen. Factors that attribute to food impaction such as plunger cusp, open and deficient tooth contact, abnormal and defective marginal ridge relationship, and improper tooth alignment and position were collected. He was found that 18% of intrabony defect associated with factors cause food impaction.(Larato, 1971) Jernberg et al reported significant relationship between open contacts and increased probing depth and attachment loss (Jernberg

et al., 1983), while Hancock et al found no relationship between contact type and gingival index or pocket depth.(Hancock et al., 1980)

In dental implant, proximal contact loss, altered morphology of implant restoration and embrasure, adjacent tooth migration, incomplete proximal papilla fill, and occlusal load are associated factors of food impaction.(Cosyn, Raes, Packet, Cleymaet, & De Bruyn, 2013; Gastaldo et al., 2004; Jernberg et al., 1983; Linkow, 1962)

Food impaction was reported between implant-supported fixed prostheses and adjacent teeth (Byun et al., 2015; Jeong & Chang, 2015; Wong et al., 2015) and 60.3% of food impaction was found in proximal contact loss.(Jeong & Chang, 2015) The relation between mesial drifting of the adjacent tooth and the osseointegrated implant may contribute proximal contact loss.(Heij et al., 2006; Wat et al., 2011) The proximal contact tightness between fixed implant prostheses and adjacent teeth was reported to decrease at 3 months after crown delivery.(Ren, Lin, Hu, & Wang, 2016) Age, prosthesis type, follow up period, alveolar bone support level of the adjacent teeth, position and location of implant fixed prostheses are associated with proximal contact loss.(Byun et al., 2015; Pang et al., 2017; Wong et al., 2015) Older patients and longer time after having restoration on implant frequently found looser proximal contact between implant and adjacent teeth. In addition, patients with implant supported fixed denture reported larger proximal space comparing to patients with implant supported single crown.(Wong et al., 2015) Lower alveolar bone level of adjacent teeth, maxillary position, and mesial site of implant supported prostheses were related to the higher prevalence of contact loss.(Pang et al., 2017) Proximal contact loss often found in longer follow up period.(Byun et al., 2015) Food impaction was also reported negative effect to the patients satisfaction.(Jeong & Chang, 2015) However, periodontal/peri-implant tissue conditions were not affected by food impaction or proximal contact loss.(Byun et al., 2015; Jeong & Chang, 2015)

In addition, the absence of interdental papilla attributes to lateral food impaction, esthetic deformity, and phonetic problem.(Tarnow et al., 1992)

Tarnow et al (1992) found that the interdental papilla presents all the time when the distance from contact point to bone crest was ≤ 5 mm and the frequency of interdental papilla presence is decreased when the distance was greater.(Tarnow et al., 1992) This result also affirmed with the study of Choquet et al, (2001) that investigated the presence of papilla between implant and teeth in anterior maxillary region.(Choquet et al., 2001) Gastaldo et al, 2004 (Gastaldo et al., 2004) reported that interproximal papilla between dental implant and teeth presented when vertical distance from base of contact point to bone crest was 3-5 mm and horizontal distance from dental implant and teeth was 3-4mm. Periodontal pathology, multiple surgery with papilla involvement, implant malposition in relation to the tooth were factors that associated with absence of interproximal papilla.(Gastaldo et al., 2004) Chow et al (2010) found that age, tooth form/shape, proximal contact length, crestal bone height, and interproximal gingival thickness were associated with gingival papilla appearance. Older patients reported higher incidence of incomplete papilla fill. Complete papilla fill observed when long narrow tooth shape or the ratio crown width to crown length ≥ 0.87 , proximal contact length ≥ 2.8 mm, the height from crestal bone to apical contact point ≤ 5 mm, interproximal gingiva thickness ≥ 1.5 mm.(Chow, Eber, Tsao, Shotwell, & Wang, 2010)

2.2 Peri-implant disease

Peri-implant diseases are the inflammation that develop in the tissues surrounding the implants and they are classified as peri-implant mucositis and peri-implantitis.(Zitzmann & Berglundh, 2008) According to a consensus report from the 1st European Workshop on Periodontology (EWOP), peri-implant mucositis was defined as reversible inflammation in the soft tissues around a functioning implant,

where peri-implantitis was an inflammation of peri-implant tissues with supporting bone loss.(Albrektsson & Isidor, 1994) Frequency of the peri-implant mucositis was reported 63.4% at subject level (number of affect patients to total patients) and 30.7% at implant level (number of affected implants to total implants) while peri-implantitis was reported 18.8% and 9.6% at subject and implant level respectively.(Atieh, Alsabeeha, Faggion Jr, & Duncan, 2013)

Plaque is the etiologic factor of peri-implant mucositis and peri-implantitis.(Tord Berglundh et al., 2018) Others risk factors of peri-implant disease are history of periodontal disease, poor plaque control/inability to clean, residual cement, smoking, keratinized tissue, genetic factors, diabetes, and overloading.(Cochran & Froum, 2013) Several consensus conference had been held to discuss about the sign and symptom of peri-implant mucositis and peri-implantitis.(T Berglundh et al., 2008; Lang, Berglundh, & Periodontology, 2011; Andrea Mombelli, 1994; A Mombelli, 1999; Papapanou et al., 2018; Zitzmann & Berglundh, 2008)

Base on the World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions in 2018,(Tord Berglundh et al., 2018) peri-implant mucositis will be diagnosed in case of there is bleeding and/or suppuration on gentle probing with or without increase in probing depth comparing with previous examination. While diagnosis of peri-implantitis will combine of bleeding or pus discharge on probing, increase probing depth compare to previous record (or probing depth $\geq 6\text{mm}$), and bone loss after remodeling (bone level $\geq 3\text{ mm}$ from coronal intraosseous part of the implant).(Tord Berglundh et al., 2018)

Peri-implant inflammation caused by food impaction in the sulcus was reported. Patients was present with complaint of pain, peri-implant tissue swelling

and suppuration. From the clinical examination, one out of four implant supported overdenture was presented with suppuration and peri-implant tissue inflammation. Bone loss was observed in the radiograph but not different from the previous one. The patient was reported to chew sunflower seed without denture due to gaging about 1 weeks ago. This was diagnosed as dental implant infection with food impaction induced and was successfully treated within 1 week with local irrigation of 0.12% of Chlorhexidine and systemic antibiotic.(Bidra, 2014)

2.3 Oral health related quality of life (OHRQoL)

Quality of life was defined by World Health Organization (WHO), 1995 as “an individuals’ perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns.”(“The World Health Organization Quality of Life assessment (WHOQOL): position paper from the World Health Organization,” 1995) It become a valid parameter in patient evaluation in almost every area of physical and mental healthcare, including oral health. Oral health related quality of life (OHRQoL) was measurement the effect of oral health to social life aspect including self-esteem, social interaction, school, and job performance, etc. The self-evaluation of OHRQoL “reflects people’s comfort when eating, sleeping and engaging in social interaction; their self-esteem; and their satisfaction with respect to their oral health”.(General, Dental, & Research, 2000)

There are many tools that is used to evaluate OHRQoL including Oral Health and Sickness Impact Profile, Dental Health Questions from the Rand Health Insurance Study, the General Oral Health Assessment Index (GOHAI), the Social Impacts of Dental Disease (SIDD), the Dental Impact on Daily Living (DIDL), Oral Health Quality of Life Inventory, the Oral Health Impact Profile (OHIP) and Oral Impacts on Daily

Performances (OIDP), etc.(Slade) OHIP and OIDP are widely used in measurement the impact of oral health problem on the patients' quality of life.

OHIP is primarily constructed of 49 items-questionnaire, then it is modified to 14 items on 7 dimensions such as functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap.(Slade, 1997) However, OHIP assesses only the frequency of the problems but do not assess the severity of individual problem.

OIDP composed of 8 item-questionnaire measure both frequency and severity through 8 daily life activities from 3 major categories which are physical, psychological and social performances.(Adulyanon, Vourapukjaru, & Sheiham, 1996) Physical consideration consisted of eating, speaking and ability to clean the mouth. Psychological issue composes relaxing including sleeping, maintaining the usual emotional state without being irritable, and smiling, laughing and showing your teeth without embarrassment. There are 2 activities in social group which are carrying out major work or social role and contact with people.

OIDP had been used to assess the quality of life in relation with oral disease and in many clinical situation, including implantation patients with different strategies in implant treatment (Montero et al., 2019) and various kind of implant prostheses such as implant-supported fixed prostheses and implant-retained overdenture.(Berretin-Felix, Nary Filho, Padovani, & Machado, 2008; Melas, Marcenes, & Wright, 2001) The results showed the improvement of life quality of the patients after they received the dental implant treatment. However, there is no study about food impaction in implant supported prostheses and quality of life.

CHAPTER III

MATERIALS AND METHODS

3.1 Study design

This study was a descriptive, cross-sectional study. OHRQoL was evaluated by OIDP using self-administered questionnaire; while food impaction between dental implant and adjacent teeth was determined whether the patients' experience or clinical examination.

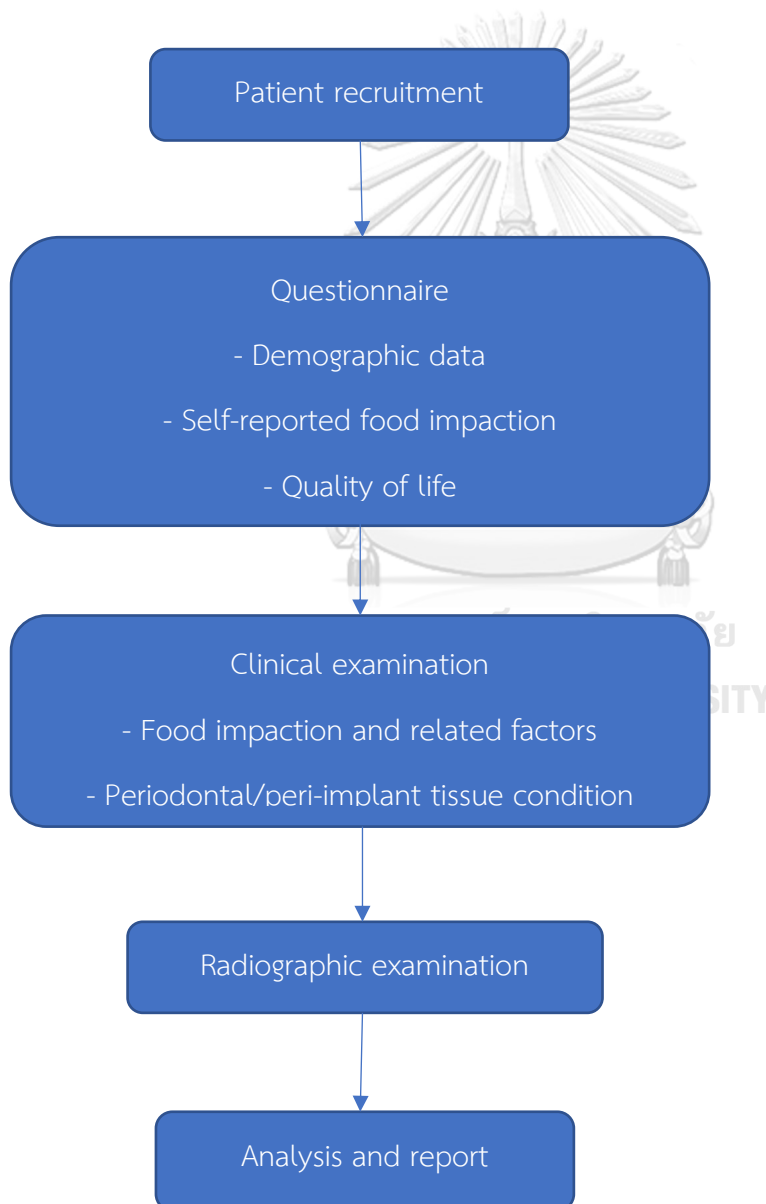


Figure 2: Research framework

3.2. Ethical approval

This study was approved study protocol and consent form from the Human Research Ethics Committee of the Faculty of Dentistry, Chulalongkorn University in compliance with the ICH/GCP no. 070/2019, study code: HREC-DCU 2019-056.

3.3 Study population and sample

3.3.1 Study population

Patients who have at least 1 implant supported single crown (ISSC) on premolar or molar region which have at least 1 proximal contact to adjacent natural tooth, and treated at Faculty of Dentistry, Chulalongkorn University (FDCU) were recruited in this study.

3.3.2 Sample size

Sample size was calculated by Krejcie and Morgan's formula. (Torcharas & Panichkul, 2011) The population was the patients who received premolar or molar implant placed at the department of Oral and Maxillofacial Surgery or Special clinic, Faculty of Dentistry Chulalongkorn University (FDCU) between 2014-2018, and restored with single crown, and had at least 1 adjacent natural tooth was 442. The population proportion was 0.45 Jeong and Chang, 2015.(Jeong & Chang, 2015)

$$n = \frac{\chi^2 N p (1 - p)}{e^2 (N - 1) + \chi^2 p (1 - p)}$$

where n = sample size

N = the population size (442)

e = the acceptable sample error (0.05)

χ^2 = the table value of Chi-square at df = 1 and 95 % of confident level (3.8416)

p = the population proportion (0.45)

The number of samples calculated was 205 participants.

3.3.3 Sample selection

Inclusion criteria:

- Patients who wear at least 1 ISSC at least 3 months.
- That ISSC must have at least 1 side contact to the adjacent natural tooth.

Exclusion criteria:

- Patients who cannot read and understand Thai language
- Patients who refuse to participate in the study

3.4 Data collection

The tools for data collection were self-administered questionnaire, clinical examination, and radiographic examination on the day that patients had their dental implant checkup at FDCU. Questionnaire compose of demographic data and oral health related quality of life (OHRQoL). In clinical examination, parameters such as food impaction, factors related to food impaction such as proximal contact tightness, proximal papilla level, plunger cusp, and opposing tooth, periodontal/peri-implant tissue conditions, adjacent and opposing teeth were recorded. Peri-apical radiographic examination was performed to assess embrasure dimension and embrasure surface area.

3.4.1 Questionnaire

The questionnaire composed of 2 part:

1. Demographic data

The age, gender, educational level, occupation, income, medical history, chemo and radiotherapy history, smoking history, history of periodontitis treatment, implant maintenance, chewing side, food impaction, food impaction removal at teeth and implant were collected by multiple choice questions.

2. OHRQoL

Oral impacts on daily performance (OIDP) questionnaire was used in assessment of OHRQoL. There were 8 performances related to the impact of oral health on daily life activities, including eating, speaking, cleaning teeth, sleeping or relaxing, maintaining emotional state, smiling, working or studying and contact with people. The frequency and severity of each performance were further evaluated if there was an impaction or the answer was “yes” as in the Table 1.

Table 1: 8 daily performances in OIDP questionnaire

Daily performance	Frequency	Severity
Eating		
Speaking		
Cleaning teeth		
Sleeping or relaxing		
Maintaining emotional state		
Smiling		
Working or studying		
Contact with people		

The frequency and severity will be evaluated into level and each level was assessed as score in the Table 2.

Table 2: Evaluation of frequency and severity in score

Score	Frequency	Severity
0	Never affected	No effect
1	Less than once a month	Very minor effect
2	Once or twice a month	Minor effect
3	Once or twice a week	Moderate effect
4	3 to 4 times a week	Severe effect
5	Nearly or every day	Very severe effect

In this study, all the questions related to 8 daily life performances focused only on the effect of food impaction on implant supported fixed restoration. Other problems from other parts of the mouth were excluded. Therefore, OHRQoL was evaluated only in patients with food impaction. The impact score of each daily performance (performance score) was calculated by multiplying frequency with severity (range from 0 to 25). The maximum possible score was multiplying maximum performance score with total performances (**25 scores × 8 performances = 200**). The final OIDP score was expressed as percentage of maximum possible score as the formula in Figure 3. Consequently, each patient presented with a score 0-100%, with higher score indicating lower OHRQoL.

$$OIDP \text{ score} = \sum_{i=1}^8 \frac{(frequency \times severity)}{maximum \text{ possible score}} \times 100$$

Figure 3: Formular for calculating OIDP score

The results of OIDP were reported also analyzed in terms of prevalence, extent, and intensity. The prevalence was the number of people affected by food impaction in their daily performance. Extent was the number of daily performances

that was affected. Intensity was classified into none, minor, moderate, and severe according to the highest performance score among eight performances (Table 3).

Table 3: Oral impact intensity classification

Oral impact intensity	Frequency/severity score	Severity/frequency score	Performance score (F x S)
No impact	0	1	0
Minor	1	1	1
	2	1	2
	3	1	3
	4	1	4
Moderate	2	2	4
	5	1	5
	3	2	6
	4	2	8
	3	3	9
	5	2	10
Severe	4	3	12
	5	3	15
	4	4	16
	5	4	20
	5	5	25

3.4.2 Clinical examination

Clinical examination evaluated food impaction between dental implant and adjacent teeth, factors related to food impaction and periodontal/ peri-implant tissue conditions, adjacent teeth and opposing teeth

1. Food impaction between dental implant and adjacent teeth

Food impaction was recorded as presence or absence. Presence of food impaction was considered when the patient experiences food impaction themselves or presence of food wedging interproximal space on clinical examination. Food impaction was reported in number of patients and number of proximal spaces.

2. Factors related to food impaction

- Proximal contact tightness

Proximal contact tightness was assessed by the resistance when passing the waxed dental floss (Dr. Phillips, Bangkok, Thailand) through interproximal contact. Degree of proximal contact tightness was recorded as very tight, tight, loose, and open. Very tight was defined when dental floss cannot pass through the proximal contact or there was a tear of dental floss after flossing. Tight was determined as definite resistance of passing dental floss, while loose was minimal resistance and open was no resistance.

- Proximal papilla

Degree of proximal papilla presence was evaluated by the papilla index scoring system.(Jemt, 1997) The lower reference line was a horizontal line connecting mid buccal marginal gingiva of ISSC and adjacent tooth. Papilla appearance was measured from reference line to the base of contact point as shown in Figure 4. The proximal papilla presence was scored as following:

- Index score 0: There was no papilla presence and a curvature of the soft tissue contour adjacent to the single implant restoration.

- Index score 1: There was papilla presence less than half of the height but not entirely filled the space and a convex curvature of the soft tissue contour adjacent to the single implant crown and adjacent tooth.
- Index score 2: There was papilla presence at least half of the height but not entirely filled the space and acceptable of the soft tissue contour is in harmony with adjacent tooth.
- Index score 3: There was papilla presence entire the proximal space and there is optimal soft tissue contour.



Figure 4: Papilla index score

3. Periodontal/peri-implant tissue assessment

Periodontal/peri-implant tissues was evaluated at the mesial/distal site of the implant and adjacent tooth in the interproximal embrasure.

- Oral hygiene status was assessed as the presence or absence of visible plaque at the soft-tissue margin.
- Bleeding on probing was assessed as presence or absence of visible bleeding after using periodontal probe with light force.
- Probing depth was measured by 1mm marking periodontal probe at the mesio-buccal and mesio-lingual and disto-buccal and disto-lingual site of proximal space between ISSC and natural teeth. Probing depth was

calculated by the mean of probing depth at mesio-buccal and mesio-lingual and/or disto-buccal and disto-lingual.

- Keratinized mucosa width was measured at buccal site.

Peri-implant mucositis was evaluated when:

- Presence of bleeding on probing
- Absence of bone loss

Peri-implantitis was determined when:

- Presence of bleeding on probing
- Probing depth \geq 6mm
- Bone loss at implant level \geq 3mm

4. Adjacent teeth

Mobility and proximal caries of adjacent natural tooth were recorded.

5. Opposing tooth

Tooth type and plunger cusp were recorded. Plunger cusp was defined as the cusp wedging food into the interproximal space of the opposing teeth. (Bathla, 2017) Type of opposing tooth was classified into natural tooth, fixed prostheses, and removable prostheses.

6. Implant

Implant system, implant type and implant diameter were also recorded.

3.4.3 Radiographic examination

Digital peri-apical radiograph was taken with the digital x-ray sensor parallel and the x-ray beam perpendicular to the proximal embrasure between the implant

supported single crown and adjacent teeth. The measurements were assessed by software program (INFINITT Healthcare Co., Ltd. Ver. 3.0.11.3 BN8.2). The reference line was drawn from implant platform level to the adjacent tooth in implant bone level (Figure 5 a). In implant tissue level, it was located 1.8 mm lower from implant platform due to all of implant tissue level was Straumann SP which has 1.8 mm of smooth neck section (Figure 5 b). There were 5 measured distances as following:

- Contact length (CL) was a vertical distance of contact area between adjacent crowns.
- Horizontal tooth implant distance (HTID) was the horizontal distance between implant-abutment level and adjacent tooth at the reference level.
- Contact point level (CPL) was the vertical distance from the base of contact between implant crown and adjacent tooth perpendicular to the reference line (line drawn from implant-abutment to adjacent tooth).
- Bone level at the tooth (BLT) was the vertical distance from the reference level (reference line from implant shoulder to tooth) at natural tooth to the most coronal level at which the width of the periodontal ligament space of the adjacent tooth was normal. The measurement value was positive when the bone was above the reference line and negative when the bone was below the reference line.
- Bone level at the implant (BLI) was vertical distance from implant-abutment level to the bone to implant contact, measured at the tooth-facing site of the implant. The measurement value was positive in coronal measurement and negative in apically measurement.

Embrasure surface area (ESA) was measured at the embrasure between implant and adjacent teeth as shown in Figure 5.

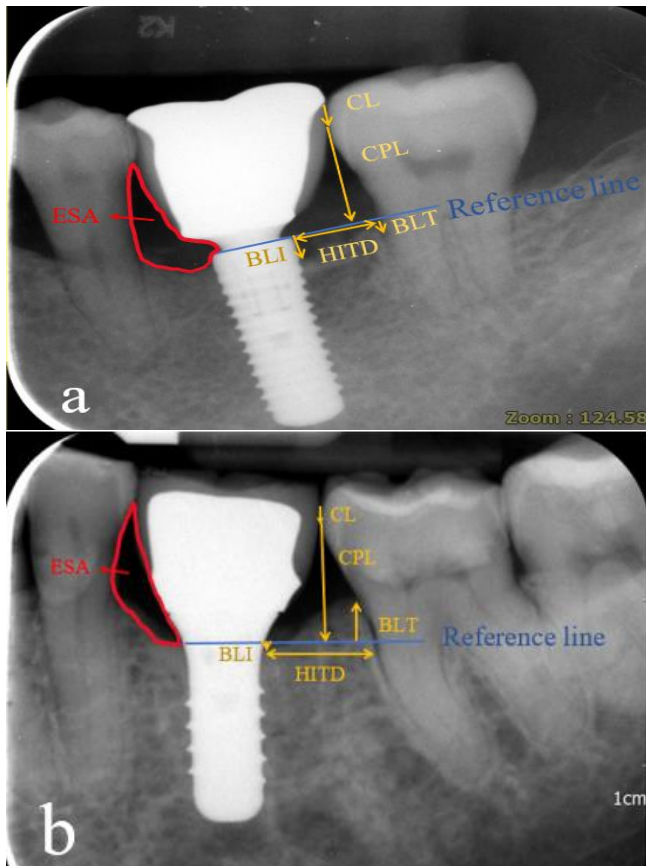


Figure 5: Radiographic measurement at proximal space between implant supported single crown and adjacent natural tooth in radiographic images.

a) measurement in bone level implant, reference line = horizontal line drawn from implant abutment level to adjacent teeth. b) measurement in tissue level implant, reference line = horizontal line drawn from 1.8 mm lower than implant abutment level to adjacent tooth. ESA (Embrasure surface area) = the area in the proximal space between implant restoration and adjacent tooth. CL (Contact length) = the length of proximal contact, CPL (Contact point level) = the distance from reference line to the base of proximal contact, BLI (Bone level at implant) = the distance from reference line to implant bone contact, HITD (Horizontal implant tooth distance) = the distance from implant to adjacent tooth at reference line level, BLT (Bone level at tooth) = the distance from reference line to bone level at tooth.

3.5 Statistical analysis

All descriptive data was analyzed by descriptive statistic (frequency, percentage, mean, range and standard deviation). Chi-square test was used in analyzing dichotomous data, while Mann-Whitney U test used to analyze quantitative data due to abnormal data distribution. Data analysis was performed by IBM SPSS Statistic for Window, Version 22.0 (IBM, Armonk, NY). All data was considered significant when P-value was less than 0.05.

3.6 Initial agreement

1. Two dentists collected the clinical data.
2. Only 1 dentist collected radiographic data after being trained to use the software to measure the distances in digital radiographic image.



CHAPTER IV

RESULTS

4.1 Demographic data

During July 2019 to July 2020, totally 178 patients, age 24-88 years (mean 56.7 years), were recruited and participated in this study. Demographic data and patients report were shown in Table 4. Most of them was female (59%), About graduated bachelor's degree (45%) and 22.5% were retired. Seventy-eight percent of them had income greater than 30,000 Baht per month, 54% reported no underlying disease, 99% did not smoke, and 64.6% of patients was restored with 1 implant. It was found that after implant restoration, 79.2% of patients followed an implant maintenance and 19.7% reported chewing at non implant side. Food impaction was found in 134 patients (75.3%). Dental floss was the most popular tool patients used for removal food impaction at implant and natural tooth, followed by brushing.

Table 4: Demographic data and patients report

Characteristic	N	%
Gender	178	100
Male	73	41
Female	105	59
Age (year)		
Mean	56.7	
Median	58	
Mode	65	
Range	24-88	
Education level		
Elementary school	6	3.4
High school	11	6.2
Bachelor's degree	80	44.9
Master's degree	61	34.3

Doctoral degree	20	11.2
Occupation		
Medical staff	17	9.6
Police officer	3	1.7
Lawyer	1	0.6
Professor	17	9.6
Businessmen	28	15.7
Secretary	3	1.7
Receptionist	1	0.6
Seller	9	5.1
Housewife	13	7.3
Retired	40	22.5
Writer	1	0.6
Hair stylist	2	1.1
Employee	32	18.1
Graphic designer	1	0.6
Engineer	7	3.9
Farmer	1	0.6
Architect	1	0.6
Accountant	1	0.6
Income		
< 10,000 Baht	13	7.3
10,000 – 30,000 Baht	27	15.2
30,001 – 50,000 Baht	47	26.4
50,001 – 80,000 Baht	45	25.3
> 80,000 Baht	46	25.8
Underlying disease		
No	96	53.9
Yes	82	46.1
History of Bisphosphonate		
No	177	99.4

Yes	1	0.6
History of Radiotherapy		
No	174	97.8
Yes	4	2.2
History of Chemotherapy		
No	174	97.8
Yes	4	2.2
History of smoking		
No	176	98.9
Yes	2	1.1
History of periodontitis treatment		
No	146	82
Yes	18	18
Implant maintenance		
No	37	20.8
Yes	141	79.2
Surgeon	68	
Prosthodontist	64	
Other dentists	12	
Chewing side		
Implant side	44	24.7
Non implant side	35	19.7
Both side	99	55.6
Food impaction (multiple selection)		
Between natural teeth	111	61.8
Between natural tooth and TSSC	60	33.7
Between natural tooth and ISSC	119	66.9
Between ISSCs	16	9
Under pontic of tooth supported bridge	11	6.2
Food impaction removal at natural teeth (multiple selection)		
Brushing	114	64

Dental floss	143	80.3
Dental floss with handle	32	18
Interproximal brush	62	34.8
Toothpick	50	28.1
Waterpik	2	1.1
Mouth rinse	4	2.2
Food impaction removal at ISSC (multiple selection)		
Brushing	98	55.1
Dental floss	138	77.5
Dental floss with handle	27	15.2
Interproximal brush	59	33.1
Toothpick	37	20.8
Waterpik	2	1.1
Mouth rinse	1	0.6
Number of implant		
1 implant	115	64.6
>1 implant	63	35.4
Food impaction		
Yes	134	75.3
No	44	24.7

ISSC=Implant supported single crown

TSSC=Tooth supported single crown

Sample description was demonstrated in Table 5. Among 178 patients, there were 286 ISSC and most of them were placed in molar and mandible position. Mean of function time was 28.6 months (range 3-168 months). Most of implant were Straumann system, bone level and 4.80 mm diameter. There were totally 410 proximal spaces between ISSC and natural tooth, 184 (57.7%) were in mesial side. Food impaction was found in 322 spaces (78.5%) of total proximal space. It was

presented 5 plunger cusps, 1 adjacent tooth mobility, and 3 adjacent teeth with proximal caries.

Table 5: Study sample description

Characteristic	N	%
Implant supported single crown	286	100
Implant position		
Premolar	51	17.8
Molar	235	82.2
Jaw position		
Maxilla	88	30.8
Mandible	198	69.2
Function time (month)		
Mean (range)	28.6 (3-168)	
Implant system		
Straumann	240	83.9
Nobel biocare	3	1.0
Astra	36	12.6
Zimmer	2	0.7
Others	5	1.7
Implant type		
Bone level	179	62.6
Tissue level	107	37.4
Implant diameter		
3.30	1	0.3
4.00	4	1.4
4.10	87	30.4
4.20	4	1.4
4.30	2	0.7
4.50	11	3.8
4.70	1	0.3

4.75	3	1.0
4.80	157	54.9
5.00	16	5.6
Proximal space	410	100
Mesial	184	57.7
Distal	135	42.3
Food impaction		
Yes	322	78.5
- Mesial space	(183)	(56.8)
- Distal space	(139)	(43.2)
No	88	21.5
Plunger cusp		
Yes	5	1.2
No	405	98.8
Adjacent tooth		
Mobility		
Yes	1	0.2
No	409	99.8
Proximal caries		
Yes	3	0.7
No	407	99.3

4.2 Food impaction and oral health related quality of life

Among 134 patients with food impaction, 90 patients (67.2%) reported at least one affected performance from totally 8 performance. Number of performances affected ranged from 0-8. One performance impacted was 30.6%, two performances was 22.4%, and three to eight performances was 14.1% as shown in Table 6.

Table 6: Affected daily performance (extent) total N = 134

Affected daily performance	Number	Percentage
0	44	32.8
1	41	30.6
2	30	22.4
3	9	6.7
4	6	4.5
5	1	0.7
6	1	0.7
7	0	0
8	2	1.5

Mean OIDP score was 6.91 (SD=7.32), ranged from 0-35. Impact intensity was classified into 4 levels. The highest percentage of impact intensity was minor (22.4%), moderate and severe impact shared equal percentage, 17.9 and 17.2% respectively. The most affected daily performance was cleaning teeth (56%) followed by eating (41%). Among eight daily performances, cleaning teeth had highest mean OIDP score with 3.26 (SD=3.49), followed by eating with 2.46 (SD=3.10) as demonstrated in Table 7.

Table 7: Prevalence, intensity of impacts of food impaction on daily performance, and OIDP scores (total N= 134 patients)

Daily performance	Prevalence		Intensity				OIDP Score			
	N (%)	N (%)	No effect	Minor	Moderate	Severe	Mean	SD	Range	95%CI
Overall impacts	90 (67.2)	13 (9.7)	30 (22.4)	24 (17.9)	23 (17.2)	6.91	7.32	0-35	5.37-8.43	
Eating	55 (41.0)	43 (32.1)	15 (11.2)	17 (12.7)	15 (11.2)	2.46	3.10	0-10	1.81-3.11	
Speaking	6 (4.5)	86 (64.2)	3 (2.2)	1 (0.7)	0 (0.0)	0.89	0.56	0-5	-0.03-0.21	
Cleaning teeth	75 (56.0)	32 (23.9)	21 (15.7)	21 (15.7)	16 (11.9)	3.26	3.49	0-12.5	2.53-3.99	
Sleeping/relaxing	6 (4.5)	87 (64.9)	1 (0.7)	2 (1.5)	0 (0.0)	0.09	0.55	0-4	-0.02-0.21	
Emotion	5 (3.7)	88 (65.7)	2 (1.5)	0 (0.0)	0 (0.0)	0.03	0.19	0-1.5	-0.01-0.07	
Smiling	13 (9.7)	80 (59.7)	5 (3.7)	4 (3.0)	1 (0.7)	0.33	1.19	0-7.5	0.08-0.58	
Working/studying	6 (4.5)	84 (62.7)	5 (3.7)	1 (0.7)	0 (0.0)	0.14	0.6	0-4	0.02-0.27	
Social contact	14 (10.4)	77 (57.5)	6 (4.5)	5 (3.7)	2 (1.5)	0.51	1.62	0-10	0.17-0.85	

4.3 Comparison periodontal/peri-implant tissue conditions and related factors between food impaction and no food impaction group.

According to Table 8, bleeding on probing was found more often at ISSC and higher pocket depth than adjacent natural tooth. However, plaque presence at ISSC, probing depth at natural tooth, and entire papilla fill were associated with food impaction. More plaque at ISSC was found in food impaction group and it was significant different between food impaction and no food impaction group (P-value = 0.047). Probing depth at adjacent tooth was found higher in food impaction and was statistically significant different (P-value = 0.023). Among different papilla levels, fully papilla fill was found more in food impaction group and there was significant difference (P-value = 0.029). Bleeding on probing and keratinized tissue width at ISSC and natural tooth, probing depth at ISSC, plaque presence at natural tooth, contact tightness, and opposing tooth were found no significant difference between food impaction and no food impaction group at P-value > 0.05.

Table 8: Periodontal/peri-implant tissue conditions between food impaction and no food impaction groups, total space = 410, food impaction = 322, and no food impaction group = 88.

Variable	Food impaction	No food impaction	P-value
	N (%)	N (%)	
ISSC			
Plaque			0.047 ^{a*}
Yes	38 (11.8)	4 (4.5)	
No	284 (88.2)	84 (95.5)	
Bleeding on probing			0.795 ^a
Yes	70 (21.7)	18 (20.5)	
No	252 (78.3)	70 (79.5)	

Probing depth (Mean \pm SD)	2.39 \pm 0.92 mm	2.26 \pm 1.03 mm	0.156 ^b
KM width (Mean \pm SD)	2.31 \pm 1.36 mm	2.26 \pm 1.32 mm	0.719 ^b
Adjacent tooth			
Plaque			0.52 ^a
Yes	33 (10.2)	7 (8.0)	
No	289 (89.8)	81 (92.0)	
Bleeding on probing			0.573 ^c
Yes	18 (5.6)	5 (5.7)	
No	304 (94.4)	83 (94.3)	
Probing depth (Mean \pm SD)	2.16 \pm 0.80 mm	1.89 \pm 0.79 mm	0.023 ^{b*}
KM width (Mean \pm SD)	2.64 \pm 1.38 mm	2.65 \pm 1.20 mm	0.692 ^b
Contact tightness			0.412 ^a
Very tight	24 (7.5)	4 (4.5)	
Tight	233 (72.4)	71 (80.7)	
Loose	56 (17.4)	12 (13.6)	
Open	9 (2.8)	1 (1.1)	
Papilla fill			0.029 ^{a*}
No papilla	9 (2.8)	8 (9.1)	
< 1/2 of the papilla height	23 (7.1)	9 (10.2)	
\geq 1/2 of the papilla height	33 (10.2)	11 (12.5)	
Entire papilla fill	257 (79.8)	60 (68.2)	
Opposing teeth			0.472 ^a
Natural teeth	270 (83.9)	69 (78.4)	
Fixed prostheses	45 (14.0)	16 (18.2)	
Removable prostheses	7 (2.2)	3 (3.4)	

ISSC = Implant supported single crown

KM = Keratinized mucosa width

^a Chi-square test

^b Mann-Whitney U test

^c Fisher' exact test due to more than 20% of cell having expected frequency less than 5

* Statistically significant (P-value < 0.05)

4.4 Comparison radiographic measurement between food impaction and no food impaction group.

Radiographic measurements were shown in Table 9. Contact was significantly longer in food impaction than no food impaction group (P-value = 0.03). Contact point level was reported significantly lower in food impaction (P-value = 0.042). Bone level at implant was not significant lower and bone level at tooth was not significant higher in food impaction group. Horizontal implant tooth distance and embrasure surface area were significant lesser in food impaction group P-value 0.001 and <0.001, respectively.

Table 9: Radiographic data among food impaction and no food impaction (Total 410 proximal spaces).

	Food impaction (N = 322)				No food impaction (N = 88)				P-value (Mann-Whitney U test)
	Mean	SD	Range	95%CI	Mean	SD	Range	95%CI	
CL	2.76	1.28	0.58-7.67	2.47-3.08	2.39	1.00	0.64-5.47	2.17-2.60	0.030*
CPL	5.45	1.89	0.92-11.03	5.12-5.92	5.90	1.75	2.29-10.21	5.46-6.24	0.042*
BLI	-0.60	1.33	-6.21-3.87	-0.96-(-0.38)	-0.34	1.22	-3.34-3.91	-0.64-(-0.17)	0.090
BLT	1.11	1.49	-3.97-5.62	0.86-1.50	1.07	1.68	-3.19-6.70	0.75-1.51	0.869
HITD	3.58	1.50	0.88-12.98	3.00-3.54	4.13	1.49	0.94-8.84	3.88-4.56	0.001*
ESA	8.76	4.67	0.14-28.35	7.29-9.14	10.43	4.70	1.87-29.69	9.55-11.74	<0.001*

CL = Contact length, CPL = Contact point level

BLT = Bone level at the tooth, BLI = Bone level at the implant

HITD = Horizontal tooth implant distance

ESA = Embrasure surface area

*statistically significant,

CHAPTER V

DISCUSSION

The purpose of this study was to assess the effect of food impaction to patient's quality of life and to compare the periodontal/peri-implant tissue condition between food impaction and no food impaction group.

The result showed high proportion of patients had food impaction between dental implant and tooth which had an impact on patient's quality of life at least one performance with high prevalence (67.2%). Therefore, patients should be informed about the incidence and impact of food impaction before dental implant treatment. Daily activities that were frequently impacted were cleaning teeth and eating. The impact was ranged from minor to sever intensity, however the majority of patients had minor intensity. Easily removal of food impaction and self-adaptation could affect in evaluation of the severity.

Food impaction between ISSC and adjacent tooth was reported 78.5% in this study which higher than other studies ranged from 42.4% to 47%.(Byun et al., 2015; Jeong & Chang, 2015; Wong et al., 2015) However, food impaction in previous studies was assessed by patient own experience only. Moreover, 40% of patients with open contact between ISSC and tooth were aware of food impaction.(Varthis, Randi, & Tarnow, 2016) This study investigated food impaction by not only patient self-report but also clinical observation, thus the prevalence of food impaction could be found more.

There are some factors that might interfere to food impaction result. Type of food could affect food impaction. Meat and vegetable may be stuck in the proximal space more than rice, wheat, or potatoes. Food impaction might be influenced by some chewing habit. Avoiding chewing dental implant restoration side or preference

of chewing soft diet at implant restoration side could camouflage the finding of food impaction at dental implant. Attrition, migration of opposing tooth, congenital abnormality morphologic of adjacent tooth would associated with food impaction.(Chopra, Sivaraman, Narayan, & Balakrishnan, 2019) These factors should be observed for longer period.

The finding of this study showed association between plaque at ISSC and food impaction. Food impaction ultimately leads to plaque deposit.(Parkinson, 1976) Plaque is one of the risk factor contribute to peri-implant tissue inflammation. In routine dental implant checkup, oral hygiene including food impaction and plaque accumulation should be checked. Oral hygiene instruction should be encouraged and emphasized to patients to prevent peri-implant disease.

Frequently bleeding on probing and deeper probing distance at ISSC than adjacent natural tooth was found in similar to the studies of Gerber et al, 2009(Gerber, Tan, Balmer, Salvi, & Lang, 2009), Byun, et al, 2015,(Byun et al., 2015) and Jeong et al, 2015(Jeong & Chang, 2015). Peri-implant mucosal might be more sensitive to deep penetration of probe than natural tooth which lead to bleeding on probing in spite of no inflammation.(Abrahamsson & Soldini, 2006) Similar to the studies of Hancock et al, 1980(Hancock et al., 1980) and Jernberg et al, 1983(Jernberg et al., 1983) we found a significant relationship between food impaction and pocket depth of natural tooth.

Open contact was found 2.4% in this study which was lower than previous studies (24.3% to 65%).(Shi, Gu, & Lai, 2019; Wong et al., 2015) Current study measured contact tightness with 90 μm thickness of dental floss, while previous study used different instruments such as Teflomire matrix band, aluminium strip, and dental floss, with different thickness ranged from 5 μm to 70 μm .(Pang et al.,

2017; Varthis et al., 2016; Wong et al., 2015) Different thickness of dental floss or thickness of measured equipment might influence in different outcomes. Therefore, proximal contact lost should be evaluated with definite quantitative measurement to be more concise and comparable.

The result showed contact length, contact point level, horizontal implant tooth distance, and embrasure surface area significant difference between food impaction and no food impaction group. Longer contact length was found in food impaction group. From previous study, Chow et al, 2010 (Chow et al., 2010) reported contact length ≥ 2.8 mm correlated with complete papilla fill which was compatible to this study with similar approximate contact length (2.76 mm). Contact point level was shorter in food impaction group which was consistent with the study of Jeong et al, 2015. (Jeong & Chang, 2015) Gastaldo et al, 2004 suggested 3 – 5 mm contact point level from alveolar crest, and 3 - 4 mm horizontal implant tooth distance for papilla presence. In this study, mean contact point level was greater than 5 mm and mean horizontal implant tooth distance was around 4 mm, that means lesser papilla presence. This study revealed lesser embrasure surface area in food impaction group with 8.76 mm^2 which is contrast to the result of Jeong et al, 2015 which reported greater embrasure area with 12.62 mm^2 in food impaction.

Limitation of this study was a cross-sectional study design which reported the impact of food impaction toward quality of life and periodontal/peri-implant tissue condition in recent time, prospective study should be assessed to observe how food impaction affect quality of life and periodontal/peri-implant tissue over time. Lesser samples than calculated was due to the pandemic of Covid-19 which patients were postponed implant checkup during April to June and the study time limitation. Moreover, most of the patients clean their teeth before seeing dentists making the finding of food impaction may be limited.



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CHAPTER VI

CONCLUSION

In conclusion, this study revealed that food impaction between ISSC and adjacent natural teeth affected quality of life from minor to severe degree especially cleaning teeth and eating. More plaque presence at ISSC, greater pocket depth at adjacent natural tooth, fully papilla fill, and greater contact length were associated with food impaction. Interestingly, the more horizontal distance and greater embrasure surface area between dental implant shoulder and natural tooth were related to no food impaction.



APPENDIX



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A, Questionnaire

แบบสอบถามงานวิจัย

เรื่องผลกระทบของการมีเศษอาหารติดระหว่างซอกฟันของครอบฟันที่รองรับด้วยรากฟันเทียมต่อ
คุณภาพชีวิตในมิติสุขภาพช่องปาก

Code:

ส่วนที่ 1 ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม

1. เพศ

 ชาย หญิง

2. อายุ.....

3. ระดับการศึกษาสูงสุดที่ท่านได้รับ

 ประถมศึกษา มัธยมศึกษาหรือเทียบเท่า ปริญญาตรี ปริญญาโท ปริญญาเอก อื่นๆ ระบุ.....

4. อาชีพหลักของท่านปัจจุบัน

 บุคลากรทางการแพทย์ บุคลากรทางทันตกรรม ดารา/นักแสดง ทหาร/ตำรวจ ทนายความ/อัยการ/ผู้พิพากษา ครู/อาจารย์ ผู้บริหาร/นักธุรกิจ นักการเมือง เลขานุการ/เจ้าหน้าที่ประจำสำนักงาน พนักงานต้อนรับ/ประชาสัมพันธ์ พ่อค้า แม่ค้า/พนักงานขายสินค้า แม่บ้าน ไม่ได้ประกอบอาชีพ อื่นๆ ระบุ.....

5. รายได้เฉลี่ยต่อเดือนของท่าน

 น้อยกว่า 10,000 บาท 10,000 ถึง 30,000 บาท 30,001 ถึง 50,000 บาท 50,001 ถึง 80,000 บาท มากกว่า 80,000 บาท

6. โรคประจำตัว

 ไม่มี โรคเบาหวาน โรคกระดูกพรุน โรคอื่นๆ ระบุ.....

7. ประวัติการรักษา

7.1 ได้รับการฉายรังสีบำบัดบริเวณใบหน้า ศีรษะ ลำคอ

 ไม่เคย เคย

7.2 ได้รับเคมีบำบัด

 ไม่เคย เคย

8. ท่านสูบบุหรี่หรือไม่

 ไม่สูบบุหรี่ สูบน้อยกว่า10 มวน/วัน สูบ10 มวน/วัน หรือมากกว่า

9. ท่านเคยได้รับการรักษาโรคปริทันต์ (โรคปริทันต์ หรือ โรคเหงือกอักเสบรุนแรง) หรือไม่

 ไม่เคยได้รับ เคยได้รับ

10. ท่านมีรากฟันเทียมที่ฟันกรามหรือฟันกรามน้อยด้านใด

 ด้านขวา ด้านซ้าย ทั้งสองด้าน

11. หลังจากได้รับการใส่ครอบฟันบนรากฟันเทียมแล้ว ท่านเคยเข้ารับการตรวจรากฟันเทียมหรือไม่ (ตอบได้มากกว่า 1 คำตอบ)

 ไม่เคย เคยตรวจกับทันตแพทย์ผู้ผ่าตัดฝังรากฟันเทียม
 เคยตรวจกับทันตแพทย์ผู้ใส่ครอบฟันบนรากฟันเทียม เคยตรวจกับทันตแพทย์ท่านอื่น

12. ปกติท่านเคี้ยวอาหารด้านไหนมากที่สุด

 ด้านที่มีรากฟันเทียม ด้านที่ไม่มีรากฟันเทียม ทั้งสองด้าน

13. ท่านมีเศษอาหารติดซอกฟันหรือไม่?

 ไม่มี มี

- หากท่านมีเศษอาหารติด กรุณาระบุตำแหน่งที่พบว่ามีเศษอาหารติดในช่องปากท่าน
หลังจากนั้นให้ลำดับตำแหน่งที่มีเศษอาหารติดนั้น (ตอบได้มากกว่า 1 คำตอบ)

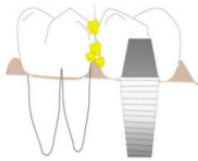
ระหว่างฟันธรรมชาติกับฟันธรรมชาติ



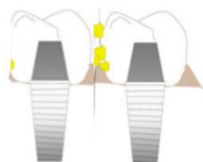
ระหว่างฟันธรรมชาติกับครอบฟันบนฟันธรรมชาติ



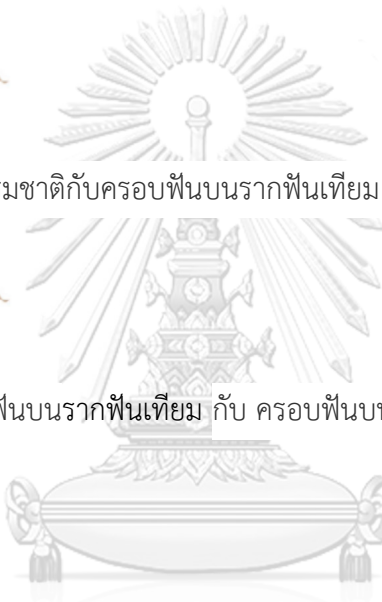
ระหว่างฟันธรรมชาติกับครอบฟันบนรากฟันเทียม



ระหว่างครอบฟันบนรากฟันเทียม กับ ครอบฟันบนรากฟันเทียม



ใต้สะพานฟัน



14. โดยทั่วไป ท่านกำจัดเศษอาหารที่ติดชอกฟันด้วย (ตอบได้มากกว่า 1 คำตอบ)

- การแปรงฟัน ไหมขัดฟัน (Dental floss) ไหมขัดฟันชนิดมีด้าม



- แปรงชอกฟัน (Interproximal brush) ไม้จิ้มฟัน อื่นๆ ระบุ.....



15. ท่านกำจัดเศษอาหารที่ติดชอกฟันของรากฟันเทียม ด้วย (ตอบได้มากกว่า 1 คำตอบ)

- การแปรงฟัน ไหมขัดฟัน (Dental floss) ไหมขัดฟันชนิดมีด้าม



- แปรงชอกฟัน (Interproximal brush) ไม้จิ้มฟัน อื่นๆ ระบุ.....



B, Data record form

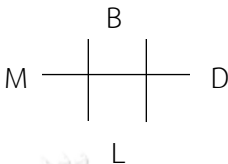
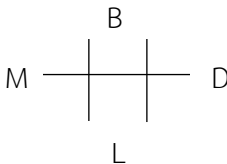
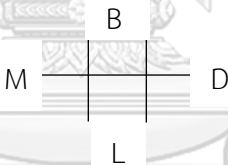
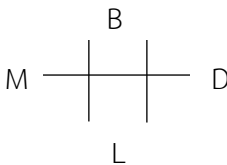
Data record form

HN:

Code:.....

Implant		
Date of Follow up		
Date of loading		
Function time		
Mesial proximal space		
Food impaction	N / Y	N / Y
Proximal contact	<input type="checkbox"/> Very tight <input type="checkbox"/> Tight <input type="checkbox"/> Loose <input type="checkbox"/> Open	<input type="checkbox"/> Very tight <input type="checkbox"/> Tight <input type="checkbox"/> Loose <input type="checkbox"/> Open
Proximal papilla	0 / 1 / 2 / 3	0 / 1 / 2 / 3
Opposing tooth	<input type="checkbox"/> Natural tooth <input type="checkbox"/> Fixed prostheses <input type="checkbox"/> RPD	<input type="checkbox"/> Natural tooth <input type="checkbox"/> Fixed prostheses <input type="checkbox"/> RPD
Distal proximal space		
Food impaction	N / Y	N / Y
Proximal contact	<input type="checkbox"/> Very tight <input type="checkbox"/> Tight <input type="checkbox"/> Loose <input type="checkbox"/> Open	<input type="checkbox"/> Very tight <input type="checkbox"/> Tight <input type="checkbox"/> Loose <input type="checkbox"/> Open
Proximal papilla	0 / 1 / 2 / 3	0 / 1 / 2 / 3
Opposing tooth	<input type="checkbox"/> Natural tooth <input type="checkbox"/> Fixed prostheses <input type="checkbox"/> RPD	<input type="checkbox"/> Natural tooth <input type="checkbox"/> Fixed prostheses <input type="checkbox"/> RPD

Peri-implant/periodontal tissue conditions

Implant		
Plaque	N / Y	N / Y
Bleeding on probing	N / Y	N / Y
Probing depth		
Keratinized mucosa	B:	B:
Mobility	N / Y	N / Y
Adjacent tooth		
Plaque	N / Y	N / Y
Bleeding on probing	N / Y	N / Y
Probing depth		
Keratinized mucosa	B:	B:
Mobility	N / Y	N / Y
Caries	N / Y	N / Y

Implant data

Implant		
Implant system	<input type="checkbox"/> Nobel Biocare <input type="checkbox"/> Straumann <input type="checkbox"/> Dentsply Sirona (Astra Tech) <input type="checkbox"/> Zimmer Biomet <input type="checkbox"/> Others.....	<input type="checkbox"/> Nobel Biocare <input type="checkbox"/> Straumann <input type="checkbox"/> Dentsply Sirona (Astra Tech) <input type="checkbox"/> Zimmer Biomet <input type="checkbox"/> Others.....
Implant type	<input type="checkbox"/> Bone level <input type="checkbox"/> Tissue level	<input type="checkbox"/> Bone level <input type="checkbox"/> Tissue level
Implant diameter		

Radiographic data

Implant		
Mesial proximal space		
Contact length		
Contact point level		
Bone level at implant		
Bone level at tooth		
Horizontal implant tooth distance		
Embrasure surface area		
Distal proximal space		
Contact length		
Contact point level		
Bone level at implant		
Bone level at tooth		
Horizontal implant tooth distance		
Embrasure surface area		

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