

Why does any single patient accept multiple complete dentures made from variously different sources of producing approaches? - Discussion over clinical research reviews -

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## Introduction

In this extra article, five different dental technicians have made dentures on identical single patient from their own sources of approaches, and their background theories are discussed in their logical terms. Even though their procedures are different from one another, this patient is satisfied with dentures made respectively. Why does this happen?

In complete denture therapy, varieties are many in procedures and theories. In the course of this discussion, the author has a fundamental question why differences of complete denture fabrication procedures do exist. The author feels something wrong around the clinical world of complete denture therapy where individual theories of dentists are presented as a matter of course. In this regard the author has an experience to publish a report by conducting randomly assigned clinical trials in order to obtain evidences of occlusal schemes in favour of complete dentures, while searching an objective scientific thinking that should be founded on clinical researches<sup>1</sup>.

Now in this article, based on this experience, it will be demonstrated in the way of literature reviews why any complete denture wearer is coherently satisfied throughout the different dentures that have been fabricated by five different dental technicians.

1. To know about relations between denture construction method and patient's process of accepting complete dentures.

1) First of all, "high quality clinical study" is needed to evaluate "patient rating of denture satisfaction".

Meanwhile, in order to discuss further on situations that "patient rating of denture satisfaction is consistent contrary to different producing procedures from one another" as described in the introduction, it will be necessary to know objectively "in what way denture construction procedures are involved with patient's process of accepting complete dentures?"

Complete denture therapy is long in its history and is various in researches. Carlsson reports that, at the point of August 2009, numbers of 10,911 articles have been issued according to the internet literature search service, Medline PubMed supplied from U.S. NCBI(National Center for Biotechnology Information)(Table 1)<sup>2, 3</sup>.

## 2) Reasons for taking particular note of "patient rating of denture satisfaction"

In the meantime, in order to establish reliable evidences, it is necessary to validate foundations on "high quality clinical studies" that assess "patient rating of denture satisfaction" among many searches of them. First, it needs to establish its significance; why needs to assess patient rating of denture satisfaction.

About 40 years ago, Weed, a physician from US, advocated "POS, Problem-Oriented-System"<sup>4</sup> which created a paradigm shift in the medical profession. Before the shift, the majority used to be involved with medical doctors or issues of diseases (DOS, Diagnosis-Oriented System or Doctor-Oriented System), but patient's QOL (Quality of Life) was taken a particular note, and patient's orientation of satisfaction founded on their right of self-determination was demanded more from the medical service.

Table 1 Search results in reference to literatures of complete dentures through Pubmed (quoted from reference no. 2)

Terms used	Number of articles	Number of reviews
Complete denture(CD)	10,911	327
CD and patient satisfaction	454	31
CD and prevalence	342	20
CD and quality of life	142	12
CD and future	100	16
Edentulous jaw and treatment choice	94	12
Edentulism and decision-making	12	4
Edentulism and implants	189	30
Edentulism and implant overdenture	40	6

Meanwhile, it has to be confirmed here that patient’s satisfaction for treatment processes is going to be demanded more than before.

Furthermore, as for therapeutic strategies, they had been previously established based on doctor’s personal experiences or suggestions joined with persons of authority in the fields. But in 1980’s the term “Evidence based medicine” was demonstrated in McMaster University in Canada and, again, in 1992, Journal of American Medical Association introduced the newly abbreviated term, “EBM”<sup>5</sup>. Since then, objectivity seeking attitude becomes far more focused than before, and scientific evidences based on comparative studies are more popular along with advanced progress in medicine.

Under these circumstances, there are many more reports on comparative studies assessing patient rating of denture satisfaction and quality of life. When considered on the concept of evidence basis, clinical figures and statistics are likely taken better for assessing medical practices rather than pathophysiological studies or expertise suggestions (Fig.1).

And, the McGill Consensus Statement in 2002<sup>4</sup> as well as the supporting literatures<sup>7,8</sup> report that dental implant supported overdenture is more excellent than complete denture in a sense of treatment modality. But depending on patient’s condition, every patient cannot simply accept dental implant placement. So in the course of determining whether or not patient really needs implant placement, the question “what kind of complete denture can be accepted by patient” would be growing its worldwide importance.



Fig.1 Evidence Pyramid(Quoted from <http://library.luhs.org/Guides/epbguide/EBMPyramid.htm>)

2. Current clinical study overviews plus considerations over issues related to complete dentures reported based on concept of evidences.

In this chapter, comments will be made regarding overviews of above title over firstly different denture construction procedures, and, secondly, various methods of impression taking and occlusal scheme where there are diversely different ideas and issues among production procedures. And then, experts’ common views will be taken account from literatures of the world which attempted to shape consensus from insufficient evidences. And in the next chapter, reports on the relationship between denture quality and patients’ degree of satisfaction will be referred to in relation with complete denture construction and will be discussed over relations with those five different dental technicians.

Table 2 Interventions referred in Chapter of Literature 1 and 2 are shown (quoted from references no.9 and 10)

	Simplified construction procedure	Complex construction procedure
Use of hinge axis and facebow	Nil	<b>Done</b>
Use of lateral check bite record	Nil	<b>Done</b>
Achievement of balanced occlusion	Nil	<b>Done</b>
Remounting after polymerization at benchside	<b>Done</b>	Nil
Remounting with new CR bite record at chairside	Nil	<b>Done</b>

1) Regarding different denture construction procedures

Presently implant supported prostheses have established their treatment options, and they can become responsible for problems that conventional complete dentures cannot cope with.

On the other hand, as a result of taking this option based on doctor’s orientation, there are created some structural problems of growing of financial burdens or patient’s physical burdens. And it has been stressed to clarify cost effectiveness of dental healthcare service that patient can be benefited <sup>6</sup>.

As for different denture construction procedures, several trustworthy reports of comparative studies are made in reference to “complex time spending procedure” and “simplified procedure”. First, following 4 pieces of respective reports will be presented <sup>9~12</sup>.

**Literature 1, 2**

1. Hickey JC, Henderson D, Straus R. Patient response to variations in denture technique. I. Design of a study. *J Prosthet Dent* 1969; 22(2): 158-170.

2. Ellinger CW, Wesley RC, Abadi BJ, Armentrout TM. Patient response to variations in denture technique. Part VII: twenty-year patient status. *J Prosthet Dent* 1989; 62(1): 45-48.

①Research method

a. Research design

Randomized controlled trial

b. Research subjects

64 edentulous subjects initially at ages 21 ~ 64. At 20-year-old follow-up, 34 subjects at ages 43 ~ 80.

c. Intervention and comparison

Refer to Table 2.

d. Assessment

Interviews at 5 and 20 years insertion (satisfaction / non satisfaction).

②Result

Significant difference is not confirmed among both procedures after 5 and 20 years insertion.

**Literature 3**

Kawai Y, Murakami H, Shariati B, Klemetti E, Blomfield JV, Bilette L, Lund JP, Feine JS. Do traditional techniques produce better conventional complete dentures than simplified techniques?. *J Dent* 2005; 33(8): 659-668.

①Research method

a. Research design

Randomized controlled trial

b. Research subjects

122 subjects at ages 45 ~ 75. At 6-month-old follow-up, 105 subjects.

c. Intervention and comparison

- Traditional group: Border molding impression with compound material in a custom tray, Polyether rubber impression taking, facebow transfer and mounting on a semi-adjustable articulator and remounting after insertion.

- Simplified group: Alginate material impression using a stock tray, using an average value articulator and no remounting.

d. Assessment period

3 and 6 months after insertion.

e. Assessment method

Patient rating of denture satisfaction according to VAS (Visual Analogue Scale)

②Result

Significant difference is not confirmed between both procedures at 3 and 6 months after insertion.

**Literature 4**

*Heydecke G, Vogeler M, Wolkewitz M, Türp JC, Strub JR. Simplified versus comprehensive fabrication of complete dentures: patient ratings of denture satisfaction from a randomized crossover trial. Quintessence Int 2008; 39(2): 107-116.*

①Research method

a. Research design

Randomized controlled trial

b. Research subjects

20 subjects at ages 50 ~ 85.

c. Intervention and comparison

• Simplified group: Bite registration with wax rims, canine and first premolar guidance with 33° artificial teeth.

• Comprehensive group: Bite registration with the Gothic arch tracing unit, using a facebow, using the lingualized artificial teeth and provision of bilaterally balanced occlusion.

d. Assessment period

3 months after insertion.

e. Assessment method

Patient rating of denture satisfaction according to VAS

②Result

Simplified group showed significantly higher in terms of “Comprehensive rating of denture satisfaction”, “Stability”, and “Esthetics”.

From above, it is suggested, therefore, that immediate practice of “complex construction procedures” that have been illustrated in traditional textbooks are not always related to improving patient rating of denture satisfaction.

It should be noted, however, that those dentures used in these clinical experiments have been constructed by experienced prosthetic experts directly or closely monitored of construction and adjustment. They have never been referred to anything about “low quality denture” anywhere. It is true that clinicians’ experiences do influence on denture therapy prognoses according to Kimoto’s et al<sup>13</sup>. It might be warned to see whether or not these results should be adapted immediately to our clinical practices in general.

2) Regarding final impressions

In this field, discussion over various procedures has been ongoing ranging from issues of non pressurized or pressurized impression taking to those of impression material selection, but comparative clinical tests are quite limited. Followings are outlines among them.

①Regarding border molding

Tan et al report that, for maxillary border molding, polyether impression material is shorter in time and more stable to take an impression of oral vestibule region than modeling compound material<sup>14</sup>. On the other hand, Drago reports that there is no difference in frequency of adjustment of border molded dentures between modeling compound material and heavy body type of silicone impression material<sup>15</sup>.

Apparently there seems no definite reason that compound material is better in quality than other materials to be used for border molding.

②Regarding impression materials to be used

Firtell et al report that there is no difference in frequency of denture adjustment in the period of one year after insertion, comparing with impression wax material and polysulfide impression material<sup>16</sup>. And, McCord et al report that zinc oxide eugenol impression material is not preferred for mandibular final impression taking among silicone rubber material, red and green mixture compound material and oxide eugenol material<sup>17</sup>.

*Table 3* Oral characteristics that may possibly influence on denture retention in Chapter of Literature 4 (quoted from reference no.9)

Terms used	Maxilla(N)	Mandible(N)
Atrophy of alveolar ridge		
Low	11	1
Medium	9	10
Extreme	1	10
Floating tuber maxillae/ retromolar tissue	4	2
Mucosal folds in the frontal area	11	5
Torus palatini/ mandibulae	2	1
Reduced salivary flow	Oral characteristic	

### ③ Regarding impression taking method

Hyde reports on clinical study using silicone layering impression techniques in 69 cases where mandibular ridge resorption is advanced to have superficial mental foramen on the lower denture bearing area allowing mental foramen opening superiorly<sup>18</sup>. Three different methods are compared in the mental foramen regions; nothing relieved at the mental foramen, relieved in 0.6mm thick spacer prepared on stone cast, and the impression material base hollowed throughout together with the custom impression tray prior to wash impression. Dentures made through these impression techniques were assessed respectively one week later after insertion. The results showed that the dentures made through modifying impression trays at the time of layering impression technique was most preferred significantly to other dentures.

From above, findings seem extremely limited to take from clinical studies about final impression takings, and no quality evidences are confirmed regarding impression materials and techniques. Also even in surveys done in U.S. dental schools<sup>19</sup>, they conclude “among many aspects of final impression making, however, there is variability in their teachings regarding the impression philosophy and the materials used”.

### 3) Regarding denture chewing surfaces and occlusal schemes

Topics above are the issues of ongoing controversy in literature over the entire century. In this context, Systematic Reviews reported

about patient rating of denture satisfaction and denture chewing surfaces in 2005<sup>20</sup>. In this report, 1,024 titles were identified through the keywords electronic searches. But only one literature<sup>21</sup> was on higher evidence level that referred to “lingualized occlusion is in favour in comparison to monoplane occlusion”.

“Evidence Based Dentistry Journal” that assesses evidences in dentistry refers to this report in criticism, “it is truly astonishing to identify an enormous lacking of evidences in this field. Even in this only one review that could be included, well-conducted quality RCT (Randomized Controlled Trial) is limited to only one research, which is almost equal to disappointment”<sup>22</sup>.

Meanwhile, in Systematic Reviews, described above, one article is eliminated due to unclarity of research program, but this interesting research will be shown here; a comparative clinical research regarding canine tooth guidance and balanced occlusion<sup>23</sup>.

#### Literature 5

*Peroz I, Leuenberg A, Haustein I, Lange KP. Comparison between balanced occlusion and canine guidance in complete denture wearers – a clinical, randomized trial. Quintessence Int 2003; 34(8): 607-612.*

#### ① Research method

a. Research design

Randomized controlled trial

b. Research subjects

22 subjects

c. Intervention and comparison

- Canine guided occlusion group (canine guidance group hereafter called CGO)
- Bilateral balanced occlusion group (bilateral balanced occlusion group hereafter called BBO).

Occlusal adjustment after 3 months, artificial teeth replacement

d. Assessment period

8 days, 4 weeks, 8 weeks, 3 months after insertion.

e. Assessment method

Patient rating of denture satisfaction according to VAS, occlusal contacts, denture ulcer, retention at eccentric relation.

②Result

CGO showed significantly higher rating of denture satisfaction than BBO in terms of “mastication”, and “mandibular denture retention”.

BBO is an occlusal scheme that is designed to stabilize a denture, but in this report where CGO is more preferred, there may be open to question how well the subject's residual ridges are conditioned. So patient's basic characteristics are extracted in *Table 3*. Accordingly as you can see, it is known that there are many subjects with poor mandibular jaw conditions. Although this report is not a high quality report since it has been eliminated in the precisely arranged Systematic Reviews, this is a report to present problems whether or not it is necessary of balanced occlusion as an occlusal scheme of complete denture.

And then, what kind of report is made after Systematic Reviews? Attention would like to be focused on full balanced occlusion and lingualized occlusion. This issue has been researched and discussed in a systematic way even within Japan. Kimoto et al report on comparative tests as a pilot study <sup>25</sup>.

**Literature 6**

QDT Art & Practice, Extra issue, 2013-5-10, Tokyo

*Kimoto S, Gunji A, Yamakawa A, Ajiro H, Kanno K, Shinomiya M, Kawai Y, Kawara M, Kobayashi K. Prospective clinical trial comparing lingualized occlusion to bilateral balanced occlusion in complete dentures: a pilot study. Int J Prosthodont 2006; 19(1): 103-119.*

①Research method

a. Research design

Non-randomized controlled trial

b. Research subjects

28 subjects

c. Intervention and comparison

- Lingualized group (lingualized occlusion group hereafter called LO)
- Bilateral balanced occlusion group (hereafter called BBO).

d. Assessment period

2 months after adjustment finished

e. Assessment terms

Patient rating of denture satisfaction (VAS), adjustment frequency, mastication efficiency

②Result

LO showed significantly higher in terms of “mandibular denture retention”.

And in 2005 Sutton et al, who are contributors to Systematic Reviews, reported fairly precise comparative study including 0° artificial teeth <sup>26</sup>.

**Literature 7**

*Sutton AF, McCord JF. A randomized clinical trial comparing anatomic, lingualized, zero-degree posterior occlusal forms for complete dentures. J Prosthet Dent 2007; 97(5): 292-298.*

①Research method

a. Research design

Randomized controlled trial

b. Research subjects

45 subjects

c. Intervention and comparison

*Table 4* Findings obtained from clinical studies regarding complete denture occlusal schemes

- Bilateral balanced occlusion is not essential to enhance patient rating of denture satisfaction.
- No significant differences of patient rating of denture satisfaction confirmed between lingualized occlusion and full balanced occlusion.
- Lingualized occlusion is more desirable for chewing efficiency in case of advanced residual ridge resorption in the mandible.
- In view of chewing, cuspal teeth are more efficient than cusplless teeth.

- 0-degree group (0° artificial teeth group)
- Anatomic group (anatomical artificial teeth group).
- Lingualized group (LO)

d. Assessment period  
8 weeks after insertion

e. Assessment terms  
Patient rating of denture satisfaction (VAS), oral health related QOL (OHIP)

②Result  
Patient rating of denture satisfaction showed in the order of “Anatomic, Lingualized > 0-degree” in terms of “esthetics” and “chewing”. And “Lingualized > 0-degree” in terms of “cleaning accessibility”  
And oral health related QOL showed “Lingualized > 0-degree” in terms of “pain”, “ulcer”, “difficulty of eating” and “interruption of meal”.

Meanwhile, the author conducted comparative study of lingualized occlusion and full balanced occlusion in 60 patients of edentulism. Although their rating of denture satisfaction have not yet been identified, it has been already reported that, in terms of chewing efficiency of mandibular moderate and advanced residual ridge resorption cases, the advanced residual ridge resorption group, provided with full balanced occlusion, showed significantly lower values <sup>1</sup>.  
In 2012, Paleari et al conducted clinical trials of canine guidance and full balanced occlusion, and reported, in normally ridge reduced patients, that there were no significant differences of mandibular jaw movements as well as patient rating of denture satisfaction <sup>24</sup>.  
As above, it can be considered that findings obtained from clinical researches of complete denture occlusal schemes are shown in *Table 4*.

4) Findings obtained from current clinical researches of complete dentures

From these clinical researches above of complete denture construction, it might be somewhat more clarified how influences of different construction skills as assumed to equip a level of prosthetic experts will be exerted on patient rating of denture satisfaction. As a matter of course, it is very clear that there are many other concepts and materials that are not referred to in literature. And so, further clinical studies and accumulation of evidences will be needed. But in view of evidences limited to denture construction and provision of occlusal schemes, there may be no advantage of complex construction procedures to enhance patient rating of denture satisfaction in comparison with simplified techniques.

3. Challenges to shaping consensus

1) Worldwide attempts through international Prosthodontics meetings

As a result of comprehensive literature research, if no better defined evidences are existing or alternatively any contradictory research results are presented, this should be truly a gray zone to black and white <sup>27</sup>. But it would be also necessary to work efforts to shaping any consensus regarding such hard terms as any immediate evidences are not available <sup>28</sup>.

Owen et al reports on Delphi method as one of consensus shaping techniques through each steps of complete denture construction procedures <sup>29</sup>. Delphi method is a convergence technique of expert opinions and empirical views through refining and converging after repeated rounds of questionnaires.

In this report, among prosthetic expert names list of ICP (International College of Prosthodontists), opinions are asked for from totaling 97 numbers of one selected from 10 experts per each nation. In an initial round of questionnaires, 41 experts as per 24 countries responded. *Table 5* shows names of nations and numbers of respondents. Thereafter, totaling 3 rounds of questionnaires are conducted and statements over 90% of agreement are reduced and converged as Minimum Acceptable Protocol (MAP). Followings are among them.

### 2) MAP ①: Psychosocial assessment

Prior to treatment, file the following documentation.

- ▶ Expectations of patient's particular comfort, function and esthetics
- ▶ Experience of complete denture therapy
- ▶ Patient's self assessment of prosthetic treatment to the present

### 3) MAP ②: Oral mucosa status prior to impression taking

As for above, 2 followings are presented.

- ▶ Prior to final impression, condition the oral mucosa. This can be normally achieved by adjusting an old denture, using a tissue conditioner, and keeping away from wearing a denture for a while before taking an impression.
- ▶ When diagnosed with oral candida, treat it before taking impression.

### 4) MAP ③: Final impression

Regarding above, it is stated "impression can be taken with various techniques using a custom tray or an old denture base. And it can be taken using even a stock tray together with compound material or alginate impression material". Additionally, following 3 requirements should be met.

- ▶ Impression area should be taken sufficiently where to be covered.
- ▶ Close adaptation should be achieved with membrane mucosa.
- ▶ Marginal border seal should be achieved.

### 5) MAP ④: Intermaxillary relation

As for above, 3 following statements are presented.

*Table 5* Nations and numbers of prosthetic experts who responded to the first round questionnaires quoted from reference no.30.

Names of nations	Numbers of respondents
Australia	2
Brazil	1
Belgium	1
Canada	4
Germany	1
Greece	3
Holland	1
India	1
Israel	1
Italy	2
Japan	2
Korea	1
Lebanon	1
New Zealand	1
Norway	1
Philippines	1
Qatar	1
Spain	1
Sweden	1
Switzerland	1
Tanzania	1
United Kingdom	4
Uruguay	1
USA	7

▶ Midline and occlusal surface plane area to be determined by a clinician. And a few of artificial teeth should be arranged provisionally, or a biteplate should be adjusted and a marked indication line should be included for proper information.

▶ Centric relation should be recorded at desirable vertical dimension of occlusion using an intermaxillary record material or the Gothic arch tracing method.

▶ Freeway space should be given at an established vertical dimension of occlusion. With this, function, speech and esthetics should be given properly and sufficiently according to an individual patient.

### 6) MAP ⑤: Esthetics

As for the anterior teeth arrangement, 3 followings requirements are to be met.

▶ Clinicians and dental technicians are to consider of various factors relating with soft tissues shape, speech, occlusal plane and neutral zone.

▶ Proper appearance is to be provided for each individual patient.

▶ Patients are to be involved with decision making of esthetics under clinicians' orientation.

### 7) MAP ⑥: Teeth arrangement geometry

As for above, 2 followings are presented.

- ▶ With the denture space that is obtained available, neutral zone is to be established toward muscles dynamics.
- ▶ (As for teeth arrangement geometry) To contribute to denture stability during function.

Furthermore added, “as long as these above are met, it is not important to use any kind of guidelines”.

### 8) MAP ⑦: Occlusion

As for above, 2 followings are presented.

- ▶ Occlusal schemes are to contribute denture stability during function.
- ▶ Intercuspal position is not to induce any denture instability or muscles and joints disorders during function, and it is to be returned to original positions by patients themselves. In this occasion, all posterior teeth should be in contact evenly.

And equally as well as in the previous statement of teeth arrangement geometry above, it is added, “as long as these are met, it will not be any problem whatever type of artificial teeth or occlusal theories”.

### 9) MAP ⑧: Insertion

As for above, 2 followings are presented.

- ▶ After polymerization, final occlusal adjustment is needed before insertion.
- ▶ With the help of proper inspection and use of material, efforts should be made to confirm any overextension of marginal border or incompatibility of impression surface.

Thereafter, statements are presented regarding denture care and maintenance, but in this article it might be omitted for limited of space. Latest guidelines are presented at ICP<sup>30</sup> regarding this issue.

These statements are what so called “the greatest common factors” based on clinicians’ opinions, which are slightly different from textbook interpretation. But, although they are admittedly in a very abstract manner, it will serve as useful references from worldwide prosthetic experts’ as well as practical views in the field.

## 4. In retrospect of 5 different technicians’ clinical cases

### 1) “Denture quality to be equipped with”

On the basis above, clinical cases of 5 different technicians will be demonstrated here in retrospect. Published reports have been focused only on fabrication processes, but it seems commonly to meet necessary factors that have been discussed in statements of MAP items, although it might refrain from referring to details here. Concepts above differ from one another, but they are truly equipped with “denture quality” that should be needed.

So what kind of relationship is there between denture quality and patient rating of denture satisfaction?

The fact is that, contrary to our expectations, numbers of evidences that might indicate “patient’s high rating of denture satisfaction may be obtained by achieving high quality denture” are quite limited. But rather many reports do not show any significant relation<sup>3,32</sup>.

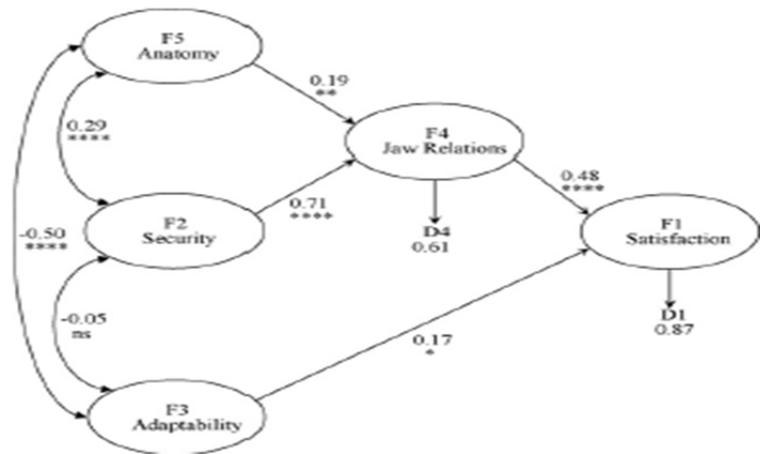
This kind of studies, first of all, is important to establish standardization of assessment of denture quality among clinicians, but it is reported that there is difficulty in standardizing this assessment even among experienced prosthetic experts<sup>31</sup>. Moreover, conventional reports have limited number of study subjects, diversely different research methods and various determination of patient rating of denture satisfaction. So, situations may be confusing at present.

### 2) Efforts to make good quality dentures are essential after all

Meanwhile, contrary to traditional series of reports, high quality report is published recently by Fenlon et al<sup>33,34</sup>. In that report, denture quality was assessed toward 417 patients of complete denture wearers at an initial visit after new denture insertion, and patient ratings of denture satisfaction were assessed with a set of questionnaires over three times, i.e. immediately after insertion, 3 months later and 2 years later.

As a result, there is a highly significant correlation between denture quality and patient rating of denture satisfaction immediately after insertion and 3 months later, and yet, there is no correlation at the period of 2 years after insertion.

*Fig.2* Structural model of patient rating of denture satisfaction (latent variables and statistical significance path). Patient rating of denture satisfaction to newly constructed dentures is strongly correlated with accuracy of intermaxillary relationship (accurate CR record and proper freeway space). Patient's adaptability to denture is also correlated even though it is smaller than this. Accuracy of reproducing intermaxillary relationship is influenced by mandibular denture retention and stability as well as mandibular residual ridge conditions (quoted from reference no.33)



Then, when is most critical period of time to clinicians who are going to design new denture construction? It may be around a period of a few months after insertion. This period of time would determine the time when whether or not new dentures could be received. And this is also a time period when new dentures are evaluated as to treatment modality at their clinical practices. Before 3 months after insertion, denture quality is in correlation to patient rating of denture satisfaction. In other words, it should be concluded, “efforts to make good quality denture are essential” because of this.

The authors of above group organized systematic data so far in 2008<sup>34</sup>. By using SEM (Structural Equation Modeling), in which an abstract concept can be assumed about issues that are not available with direct measuring determination, factors relating with patient rating of denture satisfaction are presented (Fig.2). From this illustration, it is clearly known that, in order to obtain higher patient rating of denture satisfaction, accuracy of reproduction of jaw relationship is most important, and that, in order to achieve this, it is important to establish retention and stability of the mandibular dentures. Denture construction procedures of five different dental technicians who appeared in our article have used their ingenuity of closed mouth functional impression taking or bite-seating impression taking in order to achieve this establishment. For example, usage of a treatment denture processed by Mr.Suyama might be to work with patient’s potential ability of adaptation and to enhance patient rating of denture satisfaction.

On the contrary, however, what should remember is patient’s personal nature and human relationship between clinician and patient. It is already known for a long time that, in complete denture therapy, effects of those nature and relationship are on patient rating of denture satisfaction<sup>37</sup>. Recently there is another report that interpersonal evaluation between clinician and patient is involved most critically with evaluation of complete denture therapy<sup>35</sup>. And, there is further report that what is more important in determining patient rating of denture satisfaction is patient’s own involvement of decision making about esthetic choice (selection of artificial teeth etc.) rather than esthetic achievement<sup>36</sup>.

Carlsson or Palla describes that it is more important to build up a good relationship with patient than to provide patient with a high quality technology of denture in order to enhance patient rating of denture satisfaction<sup>3,38</sup>.

In daily practice, the time that dentist can share with patient for an opportunity to exchange opinions might be quite limited, and so, an attendance of dental technician at chairside will help develop better clinician – patient relationship. In fact, those five dental technicians have excellent partnership with their own dentists respectively putting chairside attendance into customary practice as long as their circumstances permit. At this time, communication will improve clinician – patient relationship and will lead to patient better rating of denture satisfaction, joined together with their high quality skills.

As described above, the following considerations will be valid as to leading to identical single patient's satisfaction of denture wearing from five different sources of production by five dental technicians.

- ▶ Patient rating of denture satisfaction does not vary in precise terms from one procedure or technique to another.
- ▶ Each procedure or technique is in effective use for achieving the jaw position that clinicians design and for attaining mandibular denture retention and stability that support the position. As a result, all the dentures are established on proper jaw positions by the hands of clinicians.
- ▶ Communication with dental technicians or patients respectively improves patient rating of denture satisfaction.

### At the conclusion

As far as the chairside procedures of this article are concerned, they are processed in the hands of one single experienced dentist. In this opportunity, if another story is permitted, the author is presently interested in what kind of effects will be exerted on patient's response from procedural differences conversely when an

inexperienced dentist makes a denture in cooperation with those skillful five dental technicians.

For a successful complete denture therapy, high quality of skills generated from personal entire resources is vitally important. On the other hand, however, it is said that such a notion may likely create some dogmas in prosthetic theory, opinion or belief in due course<sup>39,40</sup>. In other words, non-objective information can often confuse us.

We, clinicians and dental technicians, must select best treatment modality in order to attain patient's health and high satisfaction among variety of procedures and ideas. It must be warned to get personal opinion wrong as evidence and to confuse personal ignorance as evidence.

Currently evidences are lacking regarding patient rating of denture satisfaction in relation with denture construction procedures, and any conclusions are not yet drawn. If evidences are poor in credibility, there can be one of guidelines available with opinions from clinical experts. Trisi describes that it is essential to know "what is truly answered and what is not answered"<sup>41</sup>.

It might be valuable for dentists and dental technicians with a promising future to obtain findings from this way of literature overviews.

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