



Post-Insertion Complications and Outcomes of Complete Denture

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Abstract

Background and objective: The objectives of this study are to identify common complications in complete dentures and to determine the relationships of age and sex with post-insertion complications. In addition, the correlations between post-insertion time and common complication type after the insertion of complete dentures were explored in this study.

Methods: This descriptive cross-sectional study was conducted at the Shorsh Dental Teaching Centre located in Sulaimani, Iraq. Data collection started from mid of September 2022 to August of 2023, sixty patients aged 40 years and above wearing complete dentures were selected as respondents. A questionnaire survey was executed to assess the presence of pain, retention, speech, and mastication problems at four-time intervals. The data were analysed using a chi-square test and a p-value of < 0.05 was considered statistically significant.

Results: The results of post-insertion complications in terms of pain, retention, aesthetics, and speech issues were documented as follows: On Day 1, 40%, 42%, 7%, and 5% of the respondents suffered the respective complications. On Day 3, 67%, 57%, 7%, and 7% of the respondents reported experiencing the listed issues. After a week, 48%, 53%, 5%, and 5% continuously encountered the respective complications. After a month, those who faced the respective issues were 3%, 37%, 3%, and 8%. A significant relationship was found between the complications and durations as $p < 0.05$.

Conclusion: The most common post-insertion complaints included pain, loss of retention, speech, and aesthetic issues, in that order.

Keywords: Complete denture, Denture post-insertion, Denture complications, Denture satisfaction

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Introduction

Having the experience of being edentulous or losing of tooth significantly affects one's life due to the negative impacts on appearance, psychological well-being, and emotional responses. The US National Centre for Health Statistics reported that about 40% of those residing in the US aged over 60 experienced total tooth losses. The recorded figure accounted for roughly 23 million people while another 12 million had missing teeth in at least one dental arch.¹⁻³ Many countries face the challenge of an increasingly aged population, given that the percentage of those over 65 is projected to increase by 50% in the ensuing decades. Such a high projection of the elderly population suggests a greater demand for removable dentures, particularly full dentures.⁴ Edentulism (Dental caries, periodontal disease and traumas are the main causes of tooth loss which is primarily observed in pre-elderly and older population) rates have decreased in high-income countries while the prevalence of edentulism has increased across low-income countries.⁵⁻⁷ Conventional complete denture therapy, mainly for oral rehabilitation purposes, has successfully improved aesthetics, speech, and chewing ability among patients. The success and satisfaction with complete denture treatment are dictated by numerous factors, such as biological, technical, and sociodemographic aspects, prior denture experience, and one's psychological well-being. On top of those, dentist-patient communication plays a crucial role in determining the level of satisfaction.^{8,9} Although cannot be compared with natural teeth, complete denture has an integral role in enhancing chewing ability, appearance, and speech for fully edentulous individuals. Hence, it is essential that complete dentures are comfortable and promote tissue health in support of dentures. Common complaints associated with complete dentures are pain,

pressure, looseness, chewing difficulty, and dissatisfaction with appearance. All patients should be aware of complete denture drawbacks from their initial appointment. Regular follow-up with patients is important because poorly fitting or uncomfortable dentures have an adverse effect on tissue health, which can later affect oral health.^{10,11} Upon being considered as foreign objects, most problems related to complete denture prosthetics arise from physical instead of psychological factors. Investigating the principles of denture fabrication, biomechanics, and tissue response can effectively address the emerging complication.^{12,13} This study aims to identify common issues associated with complete dentures and investigate the correlation between age and sex and post-insertion complications, also to explore the relationships between post-insertion duration and common types of complications following fitting complete denture.

Patients and methods

This descriptive cross-sectional study was carried out at the Department of Prosthodontics of the Shorsh Dental Teaching Centre (SDTC) between August 2022 and July 2023, following the permission granted by the Kurdistan Higher Council of Medical Specialties Ethics Committee (Date: 10/08/2022, No: 1391, including patient consent survey). The list of inclusion criteria are patients wearing conventional complete dentures on both jaws, those who can communicate and attend appointments at the SDTC, recent completion of complete denture treatment, ages ranging at 40-59 years (1st group) and 60 years or above (2nd group), and the inclusion of male and female patients. On the other hand, the exclusion criteria include refusal to complete the informed consent form and participate in this study, the presence of an implant-supported removable denture, and patients with mental disorders. Sixty patients were selected



randomly to participate in the survey. Upon adhering to the protocol, informed written consent was retrieved from the respondents during the interview stage. The sample size was determined based on the inclusion and exclusion criteria, the number of patients who visited the SDTC for complete dentures during the specified period, and patients who could be systematically recalled and followed up as many as four times (i.e., 24 hours, 3 days, 1 week, and 1 month). The questionnaire was designed to determine the most prevalent issues related to complete dentures. The self-administered, paper-based survey in English consists of two main sections. The initial section captured the demographic information of the respondents, whereas the second section concentrated on post-insertion complications of complete dentures. While recording their medical history, the respondents were queried about the duration of denture use, as well as pain, retention, aesthetics, and speech complications. Each question (excluding demographic data) was answered with a 'yes' or 'no' response (see detailed in the appendix). The respondents were selected from among all visitors to the SDTC who met the inclusion criteria. Intraoral examinations of denture wearers were performed by using a sterilized diagnostic set (dental mirror, tweezers, and dental probe) under dental chair light. The initial post-operative issues were addressed at the insertion appointment within the initial 24 hours (1 day). The patients were recalled after 3 days, 1 week, and 1 month for detailed clinical examinations. For statistical analysis; IBM SPSS Statistics for Windows, version 26.0 (Armonk, NY: IBM Corp) was deployed. Descriptive statistics, such as frequencies and percentages, were calculated to present the results of qualitative variables (i.e., gender, age group, retention, speech, aesthetics, pain, and discomfort). A p-value of < 0.05 was

considered statistically significant in the chi-squared (χ^2) test.

Results

The demographic information of the respondents includes gender and age. The 60 respondents consisted of 52% males and 48% females. They were classified into two age groups: 1st group comprising of middle-aged individuals (23%) and 2nd group consisting of elderly individuals (77%).

Table (1) Denture complications by duration

No.	Complications	Duration			
		1 st day (%)	3 rd day (%)	1 st week (%)	1 st month (%)
1	Pain	40	67	48	3
2	Retention	42	57	53	37
3	Aesthetics	7	7	5	3
4	Speech	5	7	5	8

Considering (Table 1) a slight balance was observed between the numbers of male and female respondents. Nonetheless, the number of elderly respondents was 3.3 times that of middle-aged respondents. Both pain and retention complications, which represent the main denture issues, were slightly equal and more obvious than aesthetics and speech complications, which were also slightly equal for all the studied durations (i.e., 24 hours, 3 days, 1 week, and 1 month). While pain decreased to 3% in the initial month, the retention problem remained constant. The prevalence of pain and retention complications was consistent among both male and female respondents for all durations. Referring to Figure (1), the highest occurrence of pain in males and females was recorded on Day 3 at 33%. Meanwhile, the maximum retention complication in males was 35% on Day 3 and 23% on Week 1 in females. Subsequently, pain complications gradually dissipated in males and decreased to 3% in females by Month 1. Retention complications remained relatively unchanged



in both male and female respondents, at 18% and 19%, respectively, by the initial month. On the contrary, aesthetics and speech complications were significantly less prevalent than the other two complications in both males and females across all durations. The highest and lowest percentages of aesthetics complication in males were 3% in Week 1 and nil in the remaining durations, respectively. In females, the maximum percentage of aesthetic complications was 7% on both Days 1 and 3, whereas the minimum percentage was 2% on both the 1st week and 1st month (Figure 1). Speech complications gradually decreased in males from 5% on Day 1 to 2% by the 1st month but an increment was observed in females from nil complication on Day 1 to 7% by the 1st month (Figure 1). The older participants in this study encountered a higher frequency of complications in comparison to middle-aged respondents across all durations and categories. As for the middle-aged respondents, the highest complication rate was observed for pain on Day 3 and in Week 1 at 15%. However, no complication was noted for aesthetic problems in Week 1. Turning to older respondents, the highest complication rate was again in pain on Day 3 at 52%. On the contrary, no complication in terms of pain was observed in the initial month Figure (2). Upon combining gender and age group for denture complications by duration, middle-aged males suffered the highest complications in aesthetics and pain, which reached 8% and 7%, respectively, in Week 1. No complication was observed in pain during the 1st week, aesthetics throughout the studied durations except for the initial month, and speech throughout all durations except for Day 1. Meanwhile, middle-aged females encountered the highest complications, reaching 15% in aesthetics in Week 1 and 10% in pain on Day 3. No speech complication was noted on Day 1 but a 2% retention issue was observed in Week 1,

aesthetics on Day 3 and in the initial month, as well as speech for all durations except Day 1 Figure (3).

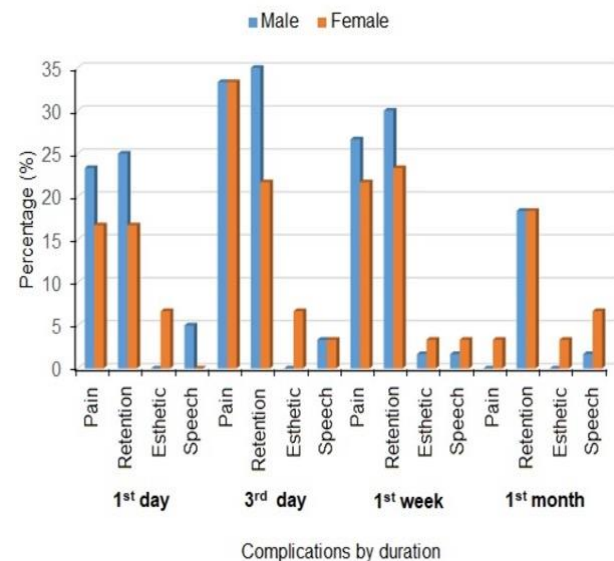


Figure (1) (Gender) and denture complications by duration

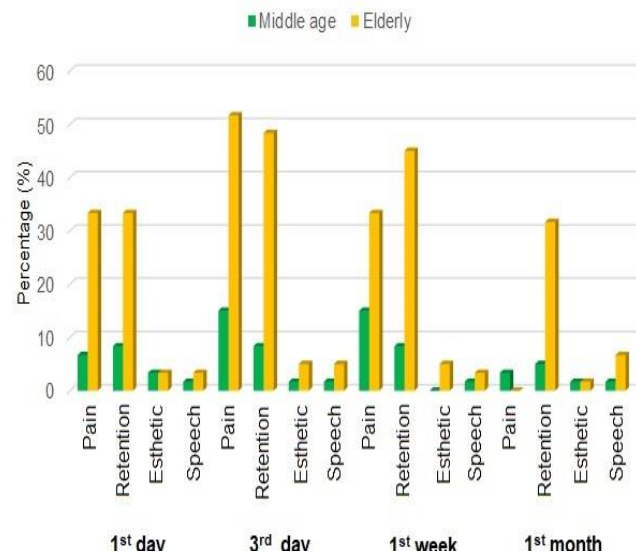


Figure (2) Age group and denture complications by duration



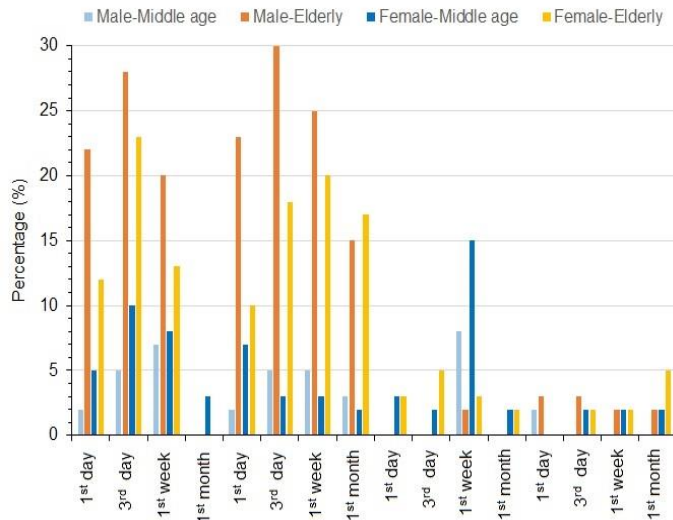


Figure (3) Gender, age group and denture complications by duration

In elderly males, the highest complications occurred in retention and pain, which reached 30% and 28%, respectively, on Day 3. Complication was found neither for pain in the first month nor for aesthetics throughout the studied durations except for Week 1. In this study, elderly females suffered the highest complications, which reached 23% in pain on Day 3 and 20% in retention in Week 1. No complication was noted in pain during the first month and speech on Day 1, with 2% in retention during the first week, aesthetics on the third day and first month, as well as speech throughout the studied durations except for Day 1. Next, speech complications were observed on Day 3 and in Week 1 at 2% Figure (3). Dentures can ease the chewing process. Both pain and retention are closely related to the chewing function over the long run. Hence, the lowest percentages of pain and retention complications noted for the initial month are ascribable to the satisfaction criterion for complete dental insertion. Male and female satisfaction levels in the initial month were 91% and 90%, respectively. The middle-aged group reported higher satisfaction at 96% but 85% for the elderly group during the same duration. The level of

satisfaction for middle-aged males and females was equal to 98% in the initial month. The satisfaction level of elderly males and females was also equal at 92% during the same duration. The χ^2 test determined the correlations between sex and aesthetics on Days 1 and 3 (p-value = 0.032), as well as the link between age group and pain in the 1st month at a p-value of 0.009 (p-value < 0.05). The Spearman's rho (r) correlation displayed a strong relationship between speech on the 3rd day and 1st week (r = 0.86 and p-value close to zero), speech on the 1st week and 1st month (r = 0.77 and p-value close to zero), and retention on the 1st week and 1st month (r = 0.71 and p-value close to zero). Moving on, a moderate correlation was found between aesthetics on the 3rd day and 1st month (r = 0.69 and p-value close to zero), speech on the 3rd day and 1st month (r = 0.66 and p-value close to zero), retention on the 3rd day and 1st week (r = 0.65 and p-value close to zero), speech on the 1st day and 3rd day (r = 0.57 and p-value close to zero), and aesthetics on the 3rd day and 1st week (r = 0.55 and p-value close to zero). Weak relationships were discovered between retention on the 3rd day and 1st month (r = 0.46 and p-value close to zero), pain on the 3rd day and 1st week (r = 0.42 and p-value of 0.01), retention on the 1st day and 3rd day (r = 0.38 and p-value of 0.003), retention on the 1st day and 1st week (r = 0.37 and p-value of 0.004), speech on the 1st day and 1st week (r = 0.32 and p-value of 0.013), and speech on the 1st day and 1st month (r = 0.27 and p-value of 0.041).

Discussion

Determining complications related to complete dentures can be as challenging as fixing them. It is definitely not easy to initially offer a patient with well-functioning complete dentures. Scholars have highlighted that such complications often arise from improper design and structural defects in the dentures.¹⁴ While complete dentures remain a widely recognised treatment for fully



edentulous patients, despite the meticulous attention given during the diverse fabrication stages by the prosthodontist, patients often suffer from denture issues after insertion.¹⁵ This present study identified the prevalence of post-insertion issues faced by patients at four time intervals (i.e., Days 1 and 2, Week 1, and Month 1) by assessing the correlations of the complications with age and gender. Many studies disclosed that pain and discomfort are the main complications experienced shortly after receiving the prosthesis, with 53% of the respondents reporting this issue.¹⁶ Likewise, Arora et al., reported that 70% of their study respondents suffered pain as the main issue attributable to injury-induced ulcers, damage to oral mucosa, sharp edges, over/under-extension, improper occlusion, and pressure areas.¹⁷ Similar outcomes were retrieved in this present study, whereby pain and discomfort emerged as the primary concerns that occurred on average seven times more frequently than other minor complications associated with aesthetics and speech. Some studies identified retention loss as a frequent complication following insertion. Parvez et al., revealed that six out of ten patients suffered from retention loss.^{14,18} Insufficient knowledge and skills, particularly when capturing impressions, appeared to be the main reason for retention loss. Enhancing impressions, applying denture adhesives, relining, and rebasing, as well as using dental implants all contribute to improving retention.^{17,19} Turning to this present study, lack of retention was the most prevalent post-insertion concern during all time intervals and was slightly equal to post-insertion pain, followed by speech and aesthetics. In this study, patients aged 60 years and above encountered more complications of the four types throughout the studied duration (3.3 times more), in comparison to patients less than 60 years. However, this finding differed from that reported by Qamar et al.,¹⁴ who

discovered a substantial proportion (32.7%) of patients fell within the 51-60 age group and followed by 61-70 years old patients (30.9%). Similarly, Parvez and colleagues found that 39.2% of patients were aged 60 years, with 27.4% aged 60-70 years experiencing the most complications.¹⁸ The study outcomes are in line with Ahmed et al.,²⁰ who found that 79% of patients with denture complications were above 60 years. This finding was ascribed to the fact that elderly people with diminished muscle control, compromised health, and impractical expectations often experienced a higher frequency of post-insertion complications. Besides, the success of prosthesis is dictated by the attitude of the patients.²¹ In this study, a higher fraction of male patients reported post-insertion pain and retention complications when compared to females. This outcome is comparable to the result reported by Qamar et al.,¹⁴ who disclosed post-insertion complications suffered by a larger proportion of male patients (56.4%) when compared to females (43.6%). Similarly, Pervez et al.,¹⁸ found a male-to-female ratio of 1.6:4.0, with 72.5% of males and 27.4% of females reporting post-insertion complaints. This finding is in line with that reported by Sadr et al.,²² who explained that females might be less likely to seek dental treatment because they were homebound and preferred private healthcare over public hospitals. On top of that, females tend to take better care of their teeth and this could have led to fewer cases of tooth loss. Moreover, cultural norms and societal pressure regarding appearance may have a crucial role in influencing the perceptions of females towards their dental outcomes.

Conclusions

The most common problem after inserting dentures often include pain, reduced retention, speech difficulties, and aesthetic concerns. Constructing complete dentures necessitates a comprehensive understanding





of various factors. The more the clinician conducts recall visits and makes adjustments, the better the denture's acceptance, minimizing complaints. Success in prosthetic procedures depends on thorough assessment, clear communication, and addressing patient anxiety and pain.

Conflict of interest

The author recorded no conflict of interest.

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