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PREVALENCE OF COMPLETE DENTURE FRACTURE - A RETROSPECTIVE STUDY

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ABSTRACT

The life of a complete denture can be paralyzed by the wearer due to a sudden fracture of their denture. It can be due to dropping of the denture, coughing, sneezing and poor occlusion.The study consisted of patients who wore complete dentures and came to the clinics for relining treatment. Sample size was 340 patients wearing complete dentures. Data was obtained from the patient management software patented by Saveetha Dental College. The data was tabulated and exported to SPSS and output was obtained.The study concluded that the prevalence of complete denture fracture was less.4 maxillary and 12 mandibular dentures were reported with fracture.The fractures were more in mandibular dentures than the maxillary dentures with a statistically significant difference.(Pearson Chi square test;$P=0.01$,$P<0.05$)

INTRODUCTION

The most common prosthesis used by edentulous people worldwide is a complete denture [1]. The most commonly used material for fabrication of dentures is polymethyl methacrylate and acrylic resin. Despite the popularity of complete denture, one of its major flaws is the fracture of denture [2]. The fracture of the denture may cripple the routine life of the patients [3]. The denture fracture may occur due to faulty denture fabrication, ill fitting, poor occlusion and low resistance of acrylic resin to fracture [4].

Fracture in denture may result due to flexural strength fatigue or impact. Flexural fatigue occurs after repeated flexing of the material while the impact failure demonstrates the mechanical limitation of the material [5]. The most common site of the fracture is on the anteroposterior line that coincides with the labial notch of either maxillary or mandibular denture. This is considered as a result of flexural fatigue. The alveolar resorption of maxilla provokes flexure on the right and left halves of the denture with a fulcrum along the midline of palate [67]. Besides that, other sides such as borders may also be involved. Future of artificial teeth includes fracture and detachments [8]. Tooth debonding is due to faulty laboratory techniques as a contaminated surfaces [9]. Existing literature have a standard classification system of denture fracture [10]. The proposed classification system will be a helpful tool for assessment of its cause and planning the repair needed [11]. Sometimes patients wearing removable partial or complete dentures in upper and lower arch can be periodontally compromised [12]. Denture wearing patients are recommended to use special toothpastes to control getting infected by microorganisms [13]. In regular prosthetic protocols, biological complications risks are reduced as well as the mechanical complications [14].

Marginal discrepancy is influenced by the choice of processing material used for the denture base and the tooth. Bacterial infections and irritation can be characterized by local findings erythema, tenderness and swelling [15].
Repeated insertion and removal during fabrication, frictional wear is reported [16]. The aim of this study is to determine the prevalence of complete denture fracture in a hospital setting.

MATERIALS AND METHOD

The study was done in a university setting. The study was also approved by the Institutional Ethics Board. Two reviewers are involved in this study. Data from 86000 patients who visited saveetha dental college during the time period june 2019 to april 2020 were reviewed. The data of patients who wore complete dentures and came for relining was collected. The sample size was 304, with patients wearing complete dentures. The case sheets were viewed separately with the help of photographs. To minimise the sampling bias, all the available data was included and no sorting was done. Internal validity included patients using complete denture prosthesis and external validity included non probability inclusion. Data was tabulated and reviewed one by one by an external reviewer. Data was exported to SPSSsoftware and variables were defined. Chi square test was done.

RESULTS AND DISCUSSION

The prevalence of complete fracture was very less in this study. Out of 340 complete denture wearers,16 patients reported with fracture (4.71%). Fracture was more prevalent in the lower dentures compared to maxillary dentures. 60% are females and 40% are males. The prevalence of wearing complete denture is more in females compared to males (Figure1). 4 maxillary and 12 mandibular dentures were reported with fracture.The fractures were more in mandibular dentures than the maxillary dentures (Figure 2). Association between gender and denture fracture was assessed and 2.94% of the females

experienced denture fracture and 1.76% of the males experienced denture fracture.Though it appears the fracture in denture was more in females compared to males no statistical significance was observed between them (Pearson Chi square test; P = 0.136, P>0.05) (Figure 3).

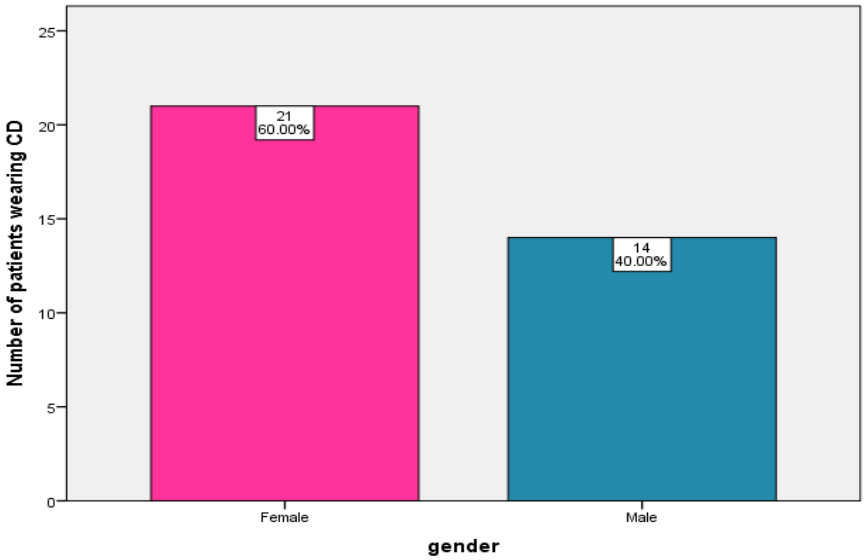

Figure 1; Bar diagram shows the distribution of complete denture wearers. X axis represents the gender and Y axis represents the number of people wearing complete dentures. 60% are females and 40% are males.

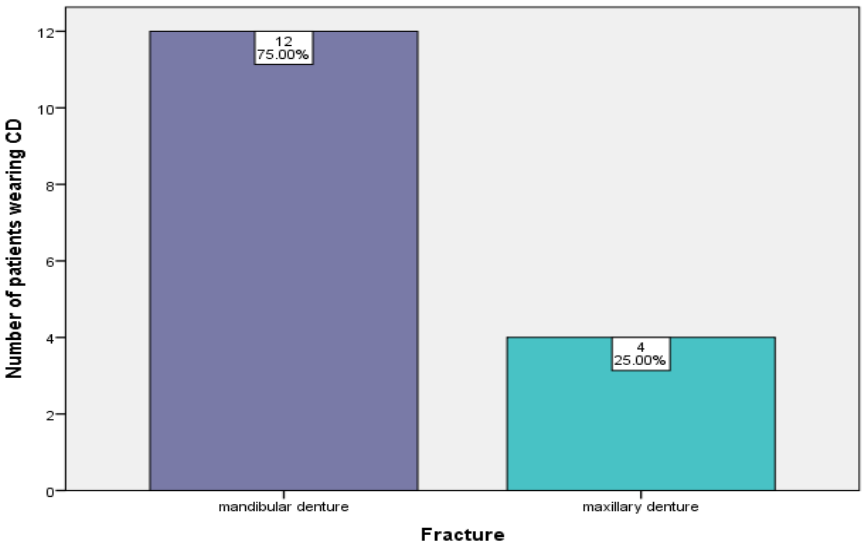

Figure 2: Bar diagram showing fracture in maxillary and mandibular dentures. X axis represents the maxillary and mandibular complete dentures with fracture and Y axis represents number of patients with fractured dentures. 75% are mandibular dentures and 25% are maxillary dentures.

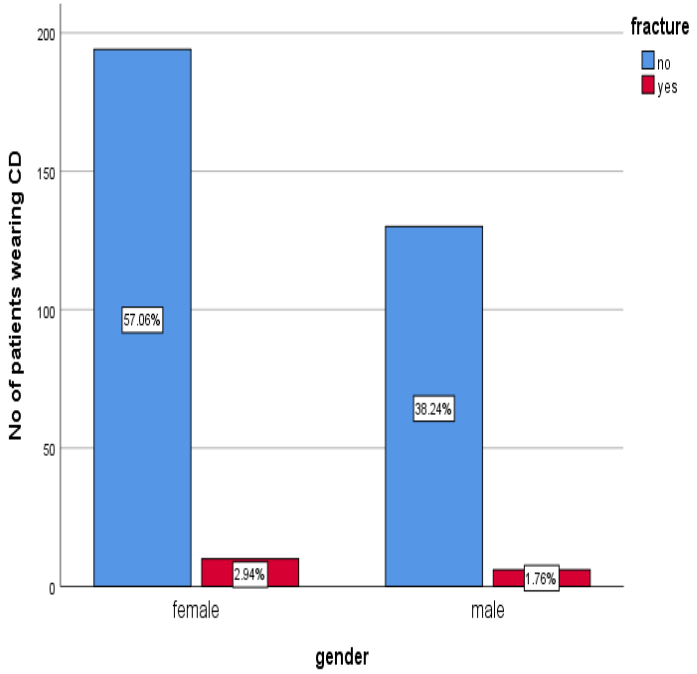

Figure 3 : Bar diagram showing association between gender and fracture in denture. X axis represents gender and Y axis represents the number of patients wearing complete denture. 2.94% of the females experienced denture fracture and 1.76% of the males experienced denture fracture. Though it appears the fracture in denture was more in females compared to males no statistical significance was observed between them (Chi square test; P = 0.136, P>0.05).

Class V fractures are the most commonly present fractures in a complete denture [17]. Midline fracture in the upper denture is related to the cyclic deformation of base during function. Fracture usually originates from the notch [18]. The less surface area and the thinness of the middle part of the lower denture attributes to fracture. Patient negligence during insertion, removal and cleaning of denture are few reasons for fracture of the lower denture [19]. The use of strengtheners like metal frame or wire in denture has shown decrease in fracture but in increased tooth debonding [20]. The problem with acrylic resins can be reduced by use of high-impact resins [21]. Electrical glass partial fibre reinforcement has significantly proved to enhance the mechanical strength of denture bases [22]. Prevalence of class V, broken and tooth debonding occur more in maxillary denture and maybe due to less ridge lap surfaces for bonding [23]. Auto polymerising resin has been the most popular material for repair because it allows easy handling and quick repair at low cost [24]. Heat polymerised resins were best followed by microwave [25]. It exhibits repair repair strength, compared to conventional heat cured and microwave polymerized resin [26] . The use of cyanoacrylate adhesive in combination with microwave polymerisation technique was found to be a good technique of repairing tooth debonding in complete dentures [27]. Most of the patients prefer ceramic teeth over the dentures due to its aesthetic appearance [28]. Prosthetic rehabilitation is done to regain function, speech and aesthetics [29]. Prosthesis

can be constructed from the polymethyl methacrylate, latexes, vinyl polymers and copolymers, polyurethane elastomers and silicone elastomers [30]. For dentures with teeth requiring crowns or replacement in the form of fixed dental prosthesis, gingival retraction becomes a mandatory procedure [31]. Proper dental care after getting prosthesis during pregnancy is very important, since pregnancy causes various hormonal changes in the body that can actually increase the risk of developing gum diseases [32]. Masticatory forces cause fatigue to the dental luting agents and the dentures, adversely affecting the retention of cement-retained crowns [33].Future scope of this study is to act as guide and have better understanding and assessment of complete denture fracture classification.

CONCLUSION

The study concluded that the prevalence of complete denture fracture was less and maybe due to proper patent education of patients in denture maintenance and hygiene. Prevalence of fracture was more in mandibular dentures.

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CONFLICT OF INTEREST

The authors declare there is no conflict of interest.

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