

ORIGINAL RESEARCH

Assessment of complete denture fracture cases

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ABSTRACT

Background: A complete denture wearer's life is suddenly immobilized by the unexpected fracture of their denture, which is necessary for their daily activities. The present study was conducted to assess various complete denture fracture cases. **Materials & Methods:** 84 complete denture-wearer patients of both genders were thoroughly inspected. Retention, stability, and occlusal faults were among the variables that were noted. The reason for the fractured denture was noted. **Results:** Out of 84 patients, males were 32 and females were 52. The etiology of denture fracture was accidental fall in 30, poor occlusion in 24, material breakage in 18, and acrylic base defect in 12 cases. The difference was significant ($P < 0.05$). The site of fracture was midline in 22%, incisor area in 14%, canine area in 12%, labial flange in 18%, molar area in 10%, and maxillary tuberosity/ retromolar pad area in 24%. The difference was significant ($P < 0.05$). **Conclusion:** Denture fractures were most frequently caused by material breakage, unintentional falls, inadequate fit, and poor occlusion.

Keywords: Complete denture, fracture, occlusion

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INTRODUCTION

A complete denture wearer's life is suddenly immobilized by the unexpected fracture of their denture, which is necessary for their daily activities. As members of the dental education faculty, it is always our intention to look into and provide solutions for issues about patients who wear complete dentures to make their lives easier and happier.¹ Complete denture fractures have a wide range of causes and explanations, as the research indicates. Denture fractures most frequently occur from extraoral sources, such as falls from the patient's fingers onto hard surfaces or from within the mouth while it is being used.² To determine the cause of denture fracture, one must mostly rely on the users' version. Fractures within the mouth can result from a number of factors, including poor occlusion, positioning artificial teeth against the palate or in the buccal slope of the ridge, pressure from neighboring natural teeth, inadequate retention and stability, long-term use that wears down artificial teeth and causes resorption of residual ridge, high frenal attachments, a prominent mid-palatine suture, a palatal or lingual torus, an undercut in hard or soft tissue, etc.³

Polymethyl methacrylate, or acrylic resin, is the substance most frequently used to make dentures (PMMA). This substance is not perfect in every way; rather, its use and popularity might be attributed to a collection of features rather than a single desired one.⁴ It is still far from ideal in meeting the mechanical requirements of a prosthesis, despite its popularity in meeting aesthetic demands, whereby a prosthesis that defies detection can be produced with the right amount of clinical expertise and careful selection and arrangement of artificial acrylic teeth.⁵ The present study was conducted to assess various complete denture fracture cases.

MATERIALS & METHODS

The present study consisted of 84 complete denture-wearer patients of both genders. All were enrolled in the study with the written consent.

Demographic data such as name, age, etc. was recorded. Dentures were thoroughly inspected. Retention, stability, and occlusal faults were among the variables that were noted. The reason for the fractured denture was noted. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of subjects

Total- 84		
Gender	Males	Females
Number	32	52

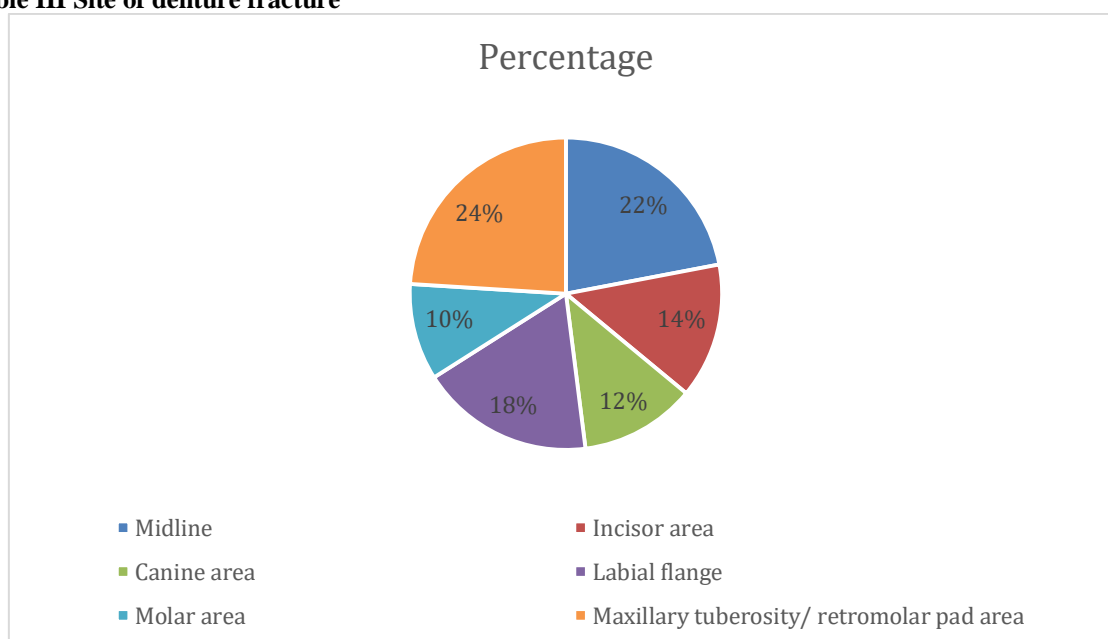
Table I shows that out of 84 patients, males were 32 and females were 52.

Table II Etiology of denture fracture

Etiology	Number	P value
Accidental fall	30	0.05
Poor occlusion	24	
Material breakage	18	
Acrylic base defect	12	

Table II shows that the etiology of denture fracture was accidental fall in 30, poor occlusion in 24, material breakage in 18, and acrylic base defect in 12 cases. The difference was significant ($P < 0.05$).

Table III Site of denture fracture



Graph I shows that the site of fracture was midline in 22%, incisor area in 14%, canine area in 12%, labial flange in 18%, molar area in 10%, and maxillary tuberosity/ retromolar pad area in 24%. The difference was significant ($P < 0.05$).

DISCUSSION

Denture fractures are a frequent occurrence. The impact strength of the denture is also significantly influenced by inherent qualities of the denture base material.⁶ By using high-impact resins, metal reinforcement (in the form of plates, wires, and fillers), and glass fibers in the form of woven mats, fractures caused by unintentional droppings can be largely avoided.⁷ The mechanical strength properties of denture bases, including as the transverse strength, ultimate tensile strength, and impact strength, are improved by glass fiber reinforcement. It is essential to perform the technical task of constructing acrylic dentures using contemporary methods that lessen porosities and voids and release residual stress.⁸ The rapid fracture of a complete denture wearer's denture, which is of the utmost importance, paralyzes them

immediately.⁹ The present study was conducted to assess various complete denture fracture cases.

We found that out of 84 patients, males were 32 and females were 52. Darbar et al¹⁰ evaluated the prevalence of the type of fracture by the distribution of questionnaires to three different laboratories. Results obtained showed that 33% of the repairs carried out were due to debonded/detached teeth. Twenty-nine percent were repairs to midline fractures, more commonly seen in upper complete dentures. The remaining 38% were other types of fractures, the majority of which constituted repairs to upper partial dentures. The latter involved the detachment of acrylic resin saddles from the metal in metal-based dentures and the fractures of connectors in the all-acrylic resin partial dentures.

We observed that the etiology of denture fracture was accidental fall in 30, poor occlusion in 24, material

breakage in 18, and acrylic base defect in 12 cases. Barpal et al¹¹ assessed the failure load of teeth made of acrylic resin bonded to two high-impact resins. Three different approaches were used to alter the ridge lap part of 120 identical denture teeth: (1) insertion of a diatoric; (2) prewetting the denture tooth with monomer; and (3) breaking the glazing. The variables were merged to create six groups, each with ten teeth, and the acrylic resins Lucitone 199 (Lucitone) and SR-Ivocap (Ivocap) were used for processing. One method of data analysis was to employ a linear regression model with heterogeneous variance. The six Ivocap groups had a mean failure load of 10.25 +/- 1.48 kg to 28.43 +/- 11.05 kg, while the Lucitone groups had a mean failure load of 16.63 +/- 5.87 kg to 28.05 +/- 5.35 kg. The highest failure loads for Lucitone 199 acrylic resin were seen when the ridge lap remained intact with no diatoric, and the usage of monomer had no discernible impact. When there was no discernible glazing influence and the ridge lap had a diatoric but no monomer inserted, the highest failure loads occurred for Ivocap resin.

We found that the site of fracture was midline in 22%, incisor area in 14%, canine area in 12%, labial flange in 18%, molar area in 10%, and maxillary tuberosity/retromolar pad area in 24%. In their investigation, Naik et al¹² discovered that the upper-to-lower denture fracture ratio was 1:3. Males accounted for the majority of fractures (55%). The most frequent causes are incorrect positioning and occlusion of the teeth for the upper denture, as well as inadvertently dropping the denture in the case of the lower one and its defective fit and stability. The most frequent location for fractures was the midline (60%). Following examination, the fracture's causes were separated into two categories: material variables and clinical/technical aspects. It was determined that suitable denture construction principles—balanced occlusion, elimination of interferences, and reduction of stress concentration—were necessary for the mechanical advantage of the denture, and that instructions for denture care were necessary to prevent accidents after denture delivery.

In Khalid et al.'s¹³ study, 290 cracked complete dentures from patients of all genders and ages 35 to 80 were gathered. The history of prior recurrent fractures, the kind of fracture, and the reasons of denture fractures were noted. Poor-fitting accounted for 40% of denture fractures, with poor occlusal relation accounting for 21% of cases. The most

prevalent kind of fracture (59%), was the midline fracture. Of the dentures in the research, 51% had had one or more prior repairs. There was almost a 3:1 ratio between lower and upper complete denture fractures, with males accounting for the majority of cracked dentures (56%).

CONCLUSION

Authors found that denture fractures were most frequently caused by material breakage, unintentional falls, inadequate fit, and poor occlusion.

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