

Original Research

Assessment of various causes responsible for fracture of complete denture- A clinical study

Aditi Sharma¹, Vishal Pratap Singh², Ginnie Bharti³

¹Lecturer, Department of Prosthodontics, Indira Gandhi Govt Dental College and Hospital, Jammu; India

²PG 3rd Year, Department of Prosthodontics, IDST Modinagar, U.P., India;

³Private practitioner, J & K, India

ABSTRACT:

Background: There are many causes and reasons associated with fractures of complete dentures. The present study was aimed to determine causes of fractures of complete denture in study population. **Materials & Methods:** The present study was conducted on 46 patients of denture wearer who visited for the complaint of fracture of dentures. A questionnaire was given to all patients and was asked to respond. The reason and site of fracture was assessed. **Results:** Out of 46 patients, males were 22 and females were 24. Common site for fracture was midline seen in 4 maxillary and 7 mandibular fracture, labial flange in 2 maxillary and 3 mandibular, canine region 5 in maxillary and 2 in mandibular, pre molar area 6 in maxillary and 2 in mandibular, tuberosity area 5 in maxillary and 3 mandibular and other area 4 in maxillary and 3 mandibular denture. The difference was significant ($P < 0.05$). Common reasons were poor denture fit in 44%, poor occlusion in 20%, base defect in 12%, material breakdown in 16% and accidents in 8%. The difference was significant ($P < 0.05$). **Conclusion:** Authors found that common reason for fracture was poor denture fit, poor occlusion, base defect material breakdown and accidents.

Key words: Denture, Fracture, maxillary

Received: 26 February, 2019

Revised: 29 March, 2019

Accepted: 30 March, 2019

Corresponding Author: Dr. Aditi Sharma, Lecturer, Department of Prosthodontics, Indira Gandhi Govt Dental College and Hospital, Jammu; India

This article may be cited as: Sharma A, Singh VP, Bharti G. Assessment of various causes responsible for fracture of complete denture- A clinical study. J Adv Med Dent Scie Res 2019;7(5): 88-91.

INTRODUCTION

The life of a complete denture wearer is suddenly obstructed by the sudden fracture of denture which is of utmost necessity for day to day routine life. There are many causes and reasons associated with fractures of complete dentures.¹The material most commonly used for the fabrication of dentures is the acrylic resin, poly methyl methacrylate (PMMA). This material is not ideal in every respect and it is the combination of properties rather than one single desirable property that accounts for its popularity and usage.² Despite its popularity in satisfying aesthetic demands whereby, with an appropriate degree of clinical expertise and with the careful selection and arrangement of artificial acrylic teeth, it is possible to produce a prosthesis which defies detection, it is still far from ideal in fulfilling the mechanical requirements of a prosthesis.³

Both base and denture teeth are the most common fracture failures and require attention as this can cause discomfort and even not wearing dentures. Thus, as part of the dental education faculty, it is always our goal to make the life of denture-wearers easier and happier by investigating and solving the problems related to complete denture patients.⁴The present study was aimed to determine causes of fractures of complete denture in study population.

MATERIALS & METHODS

The present study was conducted in the department of Prosthodontics. It comprised of 46 patients of denture wearer who visited for the complaint of fracture of dentures. The study was approved from institutional ethical committee. All patients were informed regarding the study and written consent was obtained.

General data such as name, age, gender etc. was recorded. A questionnaire was given to all patients and was asked to respond. The reason and site of fracture was assessed.

Results were tabulated and subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 46		
Gender	Males	Females
Number	22	24

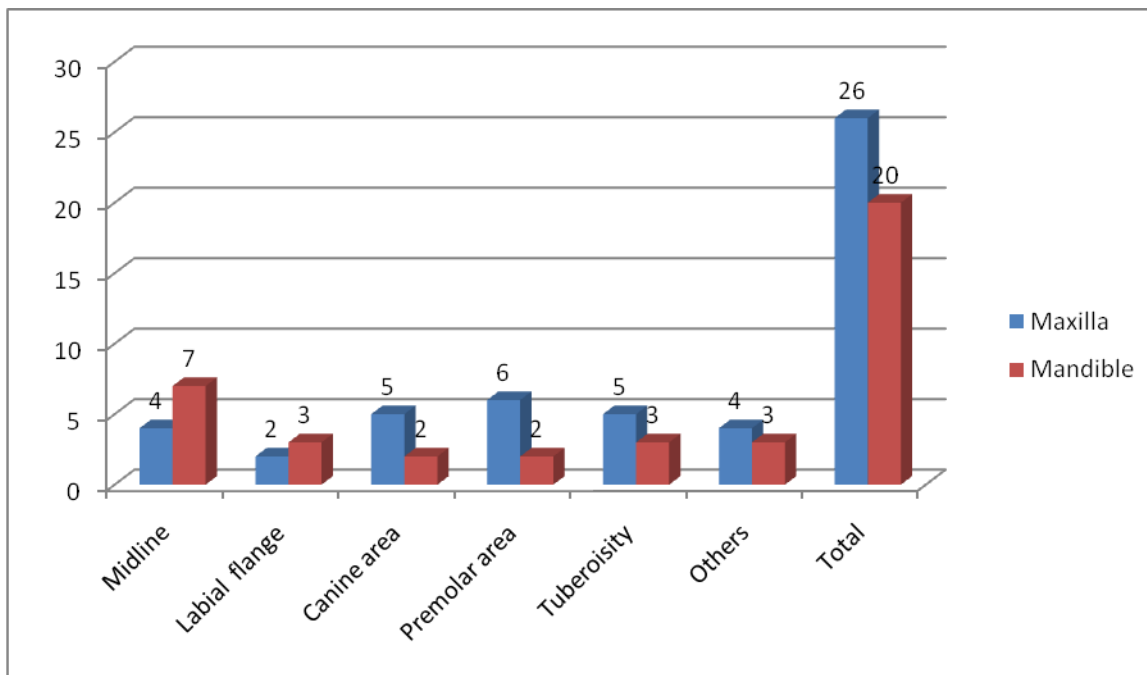
Table I shows that out of 46 patients, males were 22 and females were 24.

Table II Site of fracture

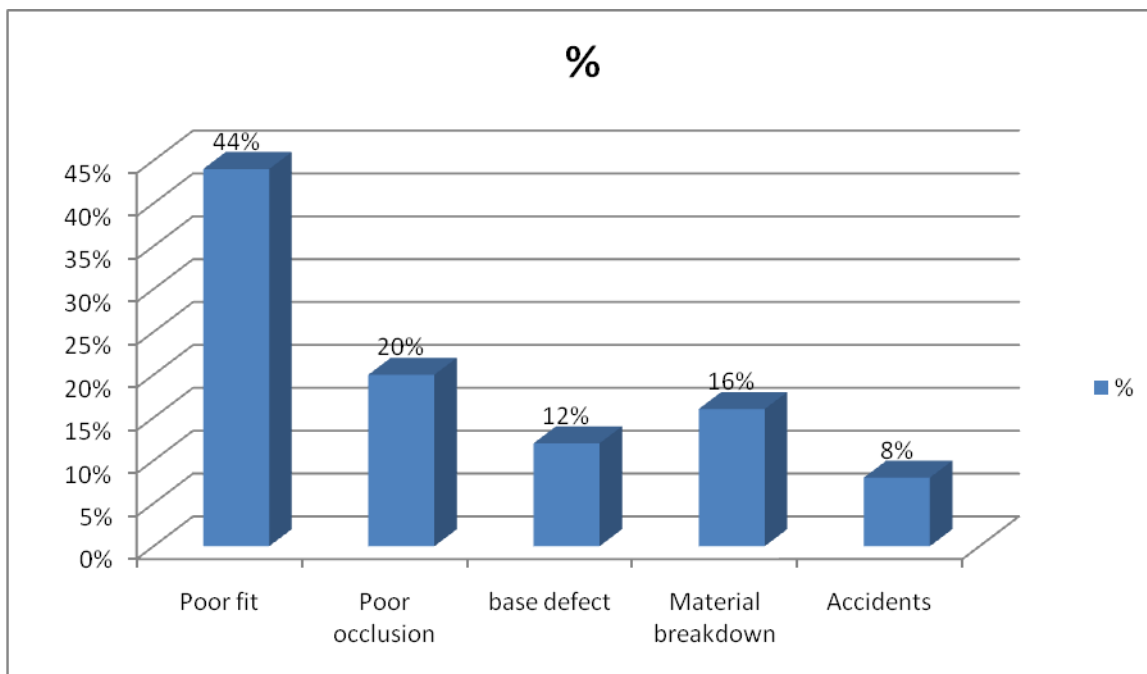
Site	Maxilla	Mandible
Midline	4	7
Labial flange	2	3
Canine area	5	2
Premolar area	6	2
Tuberoisity	5	3
Others	4	3
Total	26	20

Table II, graph I shows that common site for fracture was midline seen in 4 maxillary and 7 mandibular fracture, labial flange in 2 maxillary and 3 mandibular, canine region 5 in maxillary and 2 in mandibular, pre molar area 6 in maxillary and 2 in mandibular, tuberoisity area 5 in maxillary and 3 mandibular and other area 4 in maxillary and 3 mandibular denture. The difference was significant (P< 0.05).

Graph I Site of fracture



Graph II Reason for fracture



Graph II shows that common reasons were poor denture fit in 44%, poor occlusion in 20%, base defect in 12%, material breakdown in 16% and accidents in 8%. The difference was significant ($P < 0.05$).

DISCUSSION

Despite advances in dental technology, it can be seen that the fracture of acrylic resin dentures remains a significant problem and the number of denture fractures has not decreased. Denture fracture is usually mechanical or accidental.⁵ Fractures in dentures result from two different types of forces, namely, flexural fatigue and impact. Mechanical causes are related to faulty design, faulty fabrication and/ or poor materials choice. Any factor that exacerbates deformation of the base or alters its stress distribution will predispose the denture to fracture.⁶ The present study was aimed to determine causes of fractures of complete denture in study population.

In this study, out of 46 patients, males were 22 and females were 24. We observed that common site for fracture was midline seen in 4 maxillary and 7 mandibular fracture, labial flange in 2 maxillary and 3 mandibular, canine region 5 in maxillary and 2 in mandibular, pre molar area 6 in maxillary and 2 in mandibular, tuberosity area 5 in maxillary and 3 mandibular and other area 4 in maxillary and 3 mandibular denture.

Midline fracture is the result of cyclical deformations of the denture base during the stomatognathic system functions, while for the mandibular denture surface less and less thickness in the middle of the prosthesis are held accountable for fracture. Also, patient negligence during insertion and dis-insertion of denture is leading cause.⁷

We found that common reasons were poor denture fit in 44%, poor occlusion in 20%, base defect in 12%, material breakdown in 16% and accidents in 8%. El-Sheikh et al⁸ in their study, data was collected from patients, aged between

30 to 80 years (mean 55 plus/minus 25 years), from both the genders. Investigations were done on factors causing the fracture. After the analysis it was observed that the ratio of fracture of upper to lower denture was 1:3. Most fractures were common among males (55%). The most common reason being accidental dropping of the denture in case of the lower and improper fit and stability of the denture, improper arrangement and occlusion of the teeth for the upper one. Midline fracture was the most common site of fracture (60%). After analysis, the causes for the fracture were divided into material factors and clinical/ technical factors. It was concluded that the after denture delivery, instructions of denture care were required to reduce mishaps, proper principles of denture construction were required for mechanical advantage of the denture – balanced occlusion, removal of interferences, reduction of stress concentration areas, etc has to be followed. The use of high impact acrylics and strengthened acrylic along with methods increasing fracture toughness of the conventional acrylic dentures are to be used.

Dweiriet al⁹ found that the number of fractured complete denture collected was 290 from patients aged 35-80 years of both genders. The (causes of denture fracture, the type of fracture and the history of previous recurrent fractures) were recorded. The main cause of denture fracture was poor fitting (40%), followed by poor occlusal relation (21%). Midline fracture was the commonest type of fracture (59%). From the study (51%) of the dentures had previously been repaired once or more. The ratio of lower to upper complete denture fractures was approximately 3:1; most of the fractured dentures (56%) were those of males.

CONCLUSION

Authors found that common reason for fracture was poor denture fit, poor occlusion, base defect material breakdown and accidents.

REFERENCES

1. Matthews E, Wain EA. Stresses in denture bases. *Br Dent J* 1965;100:167-71.
2. Smith DC. The acrylic denture: Mechanical evaluation mid-line fracture. *Br Dent J* 1961;110:257-67.
3. Hargreaves AS. The prevalence of fractured dentures. *Br Dent J* 1969;126:451-5.
4. Jagger DC, Harrison A. The fractured denture-solving the problem. *J Primary Dent Care* 1998; 5: 159-162.
5. Jagger DC, Harrison A, Jandt KD. The reinforcement of dentures. *J Oral Rehabil* 1999;26:185-94.
6. Reich S, Wichmann M, Nkenke E, Proeschel P. Clinical fit of all-ceramic three-unit fixed partial dentures. generated with three different CAD/CAM systems. *Eur J Oral Sci.* 2005;113:174-9.
7. Darbar UR, Huggett R, Harrison A. Denture fracture: A survey. *Br Dent J* 1994;176:342-5.
8. El-Sheikh A M, Al-Zahrani S B. Causes of denture fracture: A survey. *Saudi dental journal* 2006; 18(3):149-154..
9. Dweiri A A. Denture fracture - A survey .middle east journal of nursing 2007; 1(6):201-205.