

## Case Report

### Frequent complete denture prosthesis fracture as a potential sign of elder maltreatment

<sup>1</sup>Saloni Shrishti, <sup>2</sup>Jacob J, <sup>3</sup>Renuka Kumari

<sup>1,3</sup>Post Graduate, Department of Prosthodontics, CIIDSRC, KUHS, Kerala, India;

<sup>2</sup>Independent Researcher, Ex Professor (Associate) KUHS, Aesthetic Implant Center, Kerala, India

#### ABSTRACT:

Elder maltreatment (EM) has been reported across the globe from various cultures during various times irrespective of traditions and religious beliefs. Renewed interest in EM has been generated with various government interventions and regulations that make health care workers a potential force to report and intervene in such social issues. Dentists in particular have been considered to be in a position since many dental treatments allow trust, building relationships between the elderly and the dentist due to long course of treatments. EM at the same time has been reported among outpatients in both medical and dental fields, and have been observed to influence treatment outcomes. Various markers that indicate EM have been either studied or suggested that indicate an indirect relation to EM. We present a case of an elderly patient who reported with frequent breakage of existing/previous complete denture prosthesis that could not be associated with usual causes. The treatment plan decided for the patient was a modified complete denture maxillary prosthesis with base metal alloy to prevent denture fracture in the future. We also suggest that frequent denture breakage that is not associated with usual causes should be considered as a potential marker for EM especially elder neglect once self-neglect has been ruled out. The patient reported on follow up that the treatment prosthesis was satisfactory and did not break or fracture after 2 years follow up.

**Keywords:** Elder neglect, elder maltreatment, complete denture prosthesis, base metal alloy, patient compliance

Received: 27 May, 2023

Accepted: 30 June, 2023

**Corresponding author:** Saloni Shrishti, Post Graduate, Department of Prosthodontics, CIIDSRC, KUHS, Kerala, India

**This article may be cited as:** Shrishti S, J Jacob, Kumari R. Frequent complete denture prosthesis fracture as a potential sign of elder maltreatment. J Adv Med Dent Scie Res 2023;11(8):59-63.

#### INTRODUCTION

The geriatric population of the world is growing at an exponential rate, one of the influencing factors being the average life expectancy increase due to improved health care. Geriatric medicine deals mainly with the clinical problems that are specific to the age group of sixty-five years and above. Between 1900 to 1992, their growth has increased from 1% to 6% of the total population. <sup>1</sup> The first case of elder maltreatment (EM) was described as early as 1975 in scientific literature (granny battering), <sup>2</sup> and since then there has been frequent reporting of various forms of elder maltreatment. According to a multi-layered classification, there are 15 different forms by which elder maltreatment can be classified. <sup>3</sup> The phenomenon of elder maltreatment is basically social in nature and therefore interventions are more conservative, although in developed nations both government and non-government organizations have taken primary and secondary steps to intervene in

such cases. <sup>4,5</sup> Accordingly the American medical association has defined it as an act of lapse by respective caregiver in terms of fulfilling the duties towards the elderly, which in turn result in harm to the welfare/health of the geriatric person. <sup>6</sup> Since EM is multifaceted and complex, it varies globally across various cultures, traditions and religious beliefs. While the most common form of the EM has been identified to be emotional in nature, the main perpetrator in such cases has been found to be one or more of the family members of the victim. <sup>7</sup> Studies have also shown that multiple types of EM occur simultaneously, which in turn hamper their identification and intervention. <sup>1,3,8</sup> Across various cultures, the victim has been found to conceal the suffering because of the fear that could result in retaliation by the caregiver and worsen his condition. Medical and dental patients are often elderly as they

are the highest consumers of these health care facilities.<sup>3,9</sup>

Neglect by the caregiver is one of the most common forms and has been attributed to be imparted in a more sublime way by the perpetrator. Refusing one's obligations to the elder can be in the form of providing an incompetent healthcare which is graded as an active neglect as compared to the passive neglect which often happens without intentions.<sup>10</sup> According to a study, in a dental outpatient, a very high number of patients were found to be suffering from neglect by their family members.<sup>3,7</sup> Few authors have reiterated that identification of such underlying condition among geriatric patients is necessary to minimize the influence on the desired treatment.<sup>11</sup> It has also been observed that caregivers if counselled (psychotherapeutic) had positive outcomes in the long-term dental treatment and improved patient compliance to dental prosthesis.<sup>12</sup> A large number of elderly patients visit their dentists regularly in need of the prosthesis in the form of either a complete or removable denture. The average life of such prosthesis according to the material nature is 4 to 5 years, following which they should be replaced. Since most of the complete denture prosthesis is made up of acrylic resins, they tend to wear and loose accuracy over such time period.<sup>13</sup> Frequent fractures of complete dentures in elderly patient have been generally attributed to clinical condition in which one of the opposing dentitions is natural teeth.<sup>14</sup> The forces generated by natural teeth tend to fracture the opposite resin base primarily in the midline. Other more common complete denture fractures are due to falling down on a hard surface and in such cases usually the borders are fractured.

We present a case of an elderly patient who reported with multiple denture fractures over a short period of time. The report also highlights the possibility of such frequent denture fractures as a potential marker for the existence of EM in patients. The main aim of the report is to associate the findings of the treatment to the current evidence associated with EM in medical and dental patients.

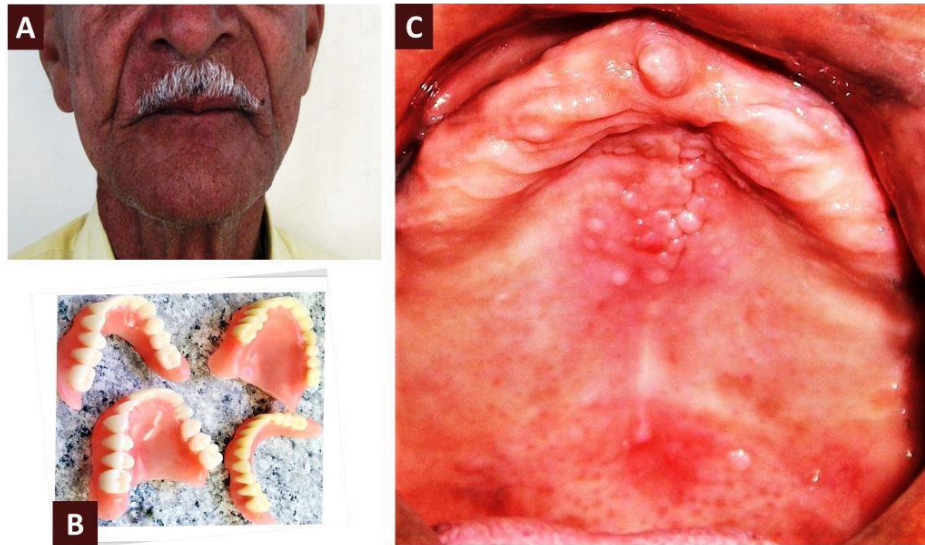
### CASE REPORT

An elderly male patient aged 70 years reported to the post graduate section of the department of Prosthodontics with a chief complaint of inadequate mastication with his complete denture prosthesis that was broken about 2 months back. The patient reported no significant medical problems that would alter the course of the present dental treatment. The patient was socially inactive and was living with his younger son's family since last 5 years, before which he was living with his elder son. Extra oral features included into a long tapering face (Figure 1A) with long upper lip and a prominent mandibular chin. The patient reported with two previous dentures that were broken in multiple flange areas with two dentures showing two different shades of artificial teeth (Figure 1B).

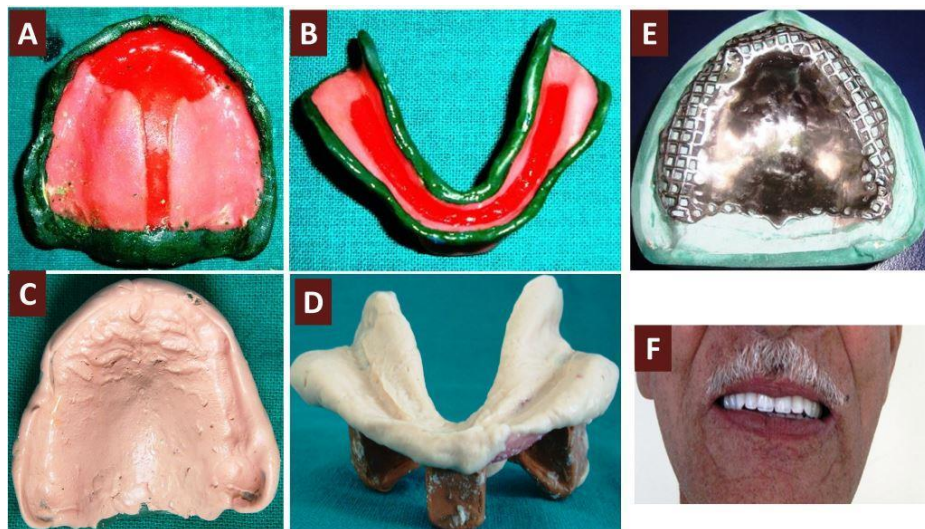
Intra oral examination showed well-formed maxillary and mandibular residual alveolar ridges, with maxillary ridge showing inflamed mucosa in the anterior region of the palate (Figure 1C). The mucosa over the anterior palatal region was oedematous and showed signs of nutritional deficiency. The patient was investigated for the existence of EM using a short form of elder abuse and neglect questionnaire.<sup>15</sup> Since breakage of the dentures could also be a form of self-neglect, therefore the existence of self-neglect was ruled out by using the criteria as described in previous published literature.<sup>16</sup> The patient was presented with multiple treatment options that included the use of an implant supported fixed prosthesis, implant supported overdentures, conventional complete dentures with metal bases or conventional complete dentures fabricated using modified fibres. The patient opted for metal denture base modified conventional complete denture. The treatment started by asking the patient to discontinue use of existing complete denture prosthesis, and undergo an oral physiotherapy program to enhance healing of maxillary mucosa. The complete denture treatment started after 3 weeks of diagnosis and treatment plan, with preliminary impressions made of irreversible hydrocolloid (Thixotropic, Zhermach, Italy). A custom made, special tray of acrylic resin (Fortex; Lucite Intl, Durham) that was based on selective pressure impression theory was used for making the final impressions. Border moulding was done using tracing impression compound green sticks (Pinnacle, DPI) for both maxillary and mandibular special tray (Figure 2 A, B). The definitive impression for maxillary arch was made using zinc oxide non-eugenol impression paste (Cavex outline BV, Holland) while the mandibular definitive impression was made using irreversible hydrocolloid (Figure 2 C, D). All respective clinical and laboratory steps that are routinely used for complete denture fabrication were accomplished till the stage of denture base processing. The metal denture base for maxillary arch was fabricated using Non precious base metal alloy (Wiron 99; Bego, Bremen, Germany), that was processed using conventional casting procedure (lost wax technique). The metal base was finished and polished and adjusted for the fit on the master cast (Figure 2 E). Jaw relations were recorded following by mounting the casts on the semi adjustable articulator (Whip Mix series 3000; Elite Dental Services, Inc, Orlando, Fla). The teeth arrangement was tried and approved by the patient following which the maxillary and mandibular complete denture were processed. On the day of denture insertion, a clinical remount procedure was done to correct occlusal changes that were incorporated as a result of water sorption and finishing/ polishing. The patient was instructed for complete denture maintenance and care using a written, verbal and auditory media.<sup>17</sup> The patient was put on routine short term and long term follow up. In the subsequent follow up visit, a clinical

remount procedure was further carried to refine the occlusion. The patient was extremely satisfied with the outcome of the treatment as claimed by him at one

year follow up visit. The patient was also highly satisfied with the aesthetic outcome of the maxillary complete denture prosthesis (Figure 2 E).



**Figure 1: (A) Extra oral view of the patient showing a tapering face with mandibular chin prominent (B) Two previous complete denture prosthesis fractured with no evidence of any technical faults (C) Intra oral picture of the anterior part of the maxillary arch showing edematous and inflamed mucosa in the midline with pin point hyperplasia in the midline.**



**Figure 2: (A) Maxillary border molded custom tray (B) Mandibular border molded custom tray (C) Definitive maxillary impression with zinc oxide non eugenol paste (D) Mandibular definitive impression using irreversible hydrocolloid (E) Metal denture base on the final cast (F) Extra oral view of the patient with complete denture prosthesis**

**DISCUSSION**

This case report presents an unusual clinical finding of previous complete denture prosthesis fractured by the patient despite the clinical condition of both dentures being excellent. Technically, both dentures were sound in terms of material and function, but because they had lost the seal due to breakage of the borders, the dentures were useless and not repairable. The questionnaire for identifying EM revealed a positive association with the patient suffering emotional or neglect by his caregivers which in this

case was his son. Elder population in India constitutes at present 12% of the entire population which is estimated to grow to 20% in the next two decades (77 million to 177 million).<sup>18,19</sup> While one may deny its existence across societies, studies have shown that it occurs between 1.1% (lower) to as high as 44% when it comes to particular forms of elder neglect.<sup>20</sup> Sooryanarayan et al. reported that the form of elder neglect was higher in the subcontinent than in the west.<sup>21</sup> In a medical emergency, the prevalence of 55% has been reported by Fulmer et al. Health care

workers are potentially seen to be in a better position to identify and intervene, which has prompted many government agencies to impart elder care in elder maltreatment as an accreditation requirement for hospitals.<sup>22</sup> Hospital screening for EM is mandatory because the victim may have the only option to contact out of his residence.<sup>14, 23</sup>

The feasibility of intervening itself has been termed as complex by many authors.<sup>1,3,11,22</sup> The themes of interventions have been broadly categorized into the prevention and management of the consequences of the EM.<sup>24</sup> The patients who seek medical and dental care are supposed to comply with the treatments that have been tailored for them in any given condition. Each treatment requires the patient to cooperate fully to seek the goals of the treatment. In many cases the underlying psychological distress associated with EM can hamper the treatment outcomes. Studies have reported differences in the patient compliance between those who are suffering from EM and those who do not have any such underlying influence.<sup>11,12</sup> In most cases the risk of developing depression, life dissatisfaction and development of other systemic health problems have been found.<sup>10, 11, 25</sup>

In a clinical study investigating treatment compliance, the authors found less treatment compliance at the end of two years,<sup>11</sup> suggesting that EM has long term effects and can effectively decrease the patient compliance, which in turn can lead to patient dissatisfaction with the treatment.

In our case, we did not investigate the patient's psychological status but we found that the patient had two sets of complete dentures made within the last few years. Such frequency is highly unlikely due to the biomechanical aspects of the oral cavity (excessive forces caused by natural opposing teeth) and cannot be attributed to otherwise dropping the denture on a hard surface. While asking the patient about the latter, the patient did not verify that it was broken due to a fall. The patient though verified that he used to clean the dentures every time by sitting down, as instructed by his previous dentists. Geriatric patients seek dental care regularly since there is a decline in oral masticatory functions with the loss of natural teeth. EM has been reported to be associated with presence of poor oral hygiene in patients who are partially dentulous. Wiseman reported that EM had the unusual presence of root caries which was due to poor oral hygiene maintenance.<sup>26</sup> Other signs that are potential markers of EM and, in particular elder neglect are improper feeding, poor personal hygiene and neglected need for medical and dental treatment.<sup>27</sup> Since root caries can be found only in dentulous state, we suggest that in completely edentulous patients' frequent breakage of existing dentures that is not associated with any cause and poor denture hygiene as a potential marker for existence of elder neglect. Moreover, most elderly are dependant on their family for medical care, while the dental care is completely based on an individual and cannot be done

by others,<sup>28</sup> unless the elderly patient has some mental or physical disability.<sup>29</sup> Garg et al, in their comparative study have reported that their patients who were suffering from EM had poorly maintained dentures that were significantly different from those who did not suffer from EM.<sup>30</sup>

## CONCLUSION

Elderly people who are completely edentulous and report with frequent fractures of the prosthesis should be investigated for the existence of elder maltreatment. Poor denture hygiene of existing dentures can provide a clue to the patients underlying psychological influences like depression that could be as a result of elder neglect.

## ACKNOWLEDGEMENTS

The authors acknowledge the efforts of the staff of the department of psychiatry for their valued contribution during the patient's investigation and diagnosis process. We also wish to extend our sincere thanks to the dental technicians who played a vital role in the fabrication of the base metal reinforced complete denture prosthesis.

## CONFLICT OF INTEREST

None

## REFERENCES

- Collins KA. Elder maltreatment: a review. *Archives of pathology & laboratory medicine.* 2006;130(9):1290-6.
- Kleinschmidt KC. Elder abuse: a review. *Annals of emergency medicine.* 1997;30(4):463-72.
- Mattoo KA, Garg R, Dhingra S. Classifying elder abuse – A review. *Gerontology and Geriatric Research.* 2019; 2(1):118
- Myhre J, Saga S, Malmedal W, Ostaszkiwicz J, Nakrem S. Elder abuse and neglect: an overlooked patient safety issue. A focus group study of nursing home leaders' perceptions of elder abuse and neglect. *BMC health services research.* 2020;20(1):1-4.
- Corbi G, Grattagliano I, Sabbà C, Fiore G, Spina S, Ferrara N, Campobasso CP. Elder abuse: perception and knowledge of the phenomenon by healthcare workers from two Italian hospitals. *Internal and Emergency Medicine.* 2019; 14:549-55.
- Meeks-Sjostrom DJ. Clinical decision making of nurses regarding elder abuse. *Journal of Elder Abuse & Neglect.* 2013;25(2):149-61.
- Mattoo KA, Shalabh K, Khan A. Geriatric forensics: A dentist's perspective and contribution to identify existence of elder abuse among his patients. *Journal Of Forensic Dental Sciences.* 2010;2(2):81
- Hunsaker III JC, Shields LB. Violence Against the Elderly. *Handbook of Forensic Medicine.* 2022; 2:1005-19.
- Mohd Rosnu NS, Singh DK, Mat Ludin AF, Ishak WS, Abd Rahman MH, Shahar S. Enablers and barriers of accessing health care services among older adults in south-east Asia: a scoping review. *International Journal of Environmental Research and Public Health.* 2022;19(12):7351.
- Sharma R, Kaur R. Elder abuse, depression, relationships and attachments: Determinants of mental

- health in later life. *International Journal on Ageing in Developing Countries*. 2016;1(1):68-81.
11. Alqarni MA, Mattoo K, Dhingra S, Baba SM, Al Sanabani F, Al Makramani BMA, Akkam HM. Sensitizing family caregivers to influence treatment compliance among elderly neglected patients—a 2-year longitudinal study outcome in completely edentulous patients. *Healthcare* 2021; 9: 533.
  12. Garg R, Mattoo K, Kumar L, Khalid I, Baig F, Elnager M, Faridi MA. Impact of Sensitization of Family Caregivers upon Treatment Compliance among Geriatric Patients Suffering from Elder Abuse and Neglect. *Healthcare* 2021; 9:226.
  13. Leles CR, Oliveira TM, de Araújo SC, Nogueira TE, Schimmel M. Individual factors associated with masticatory performance of complete denture wearers: A cross-sectional study. *Journal of oral rehabilitation*. 2019;46(10):903-11.
  14. de Oliveira Limírio JP, de Luna Gomes JM, Rezende MC, Lemos CA, Rosa CD, Pellizzer EP. Mechanical properties of polymethyl methacrylate as a denture base: Conventional versus CAD-CAM resin—A systematic review and meta-analysis of in vitro studies. *The Journal of prosthetic dentistry*. 2022;128(6):1221-9.
  15. Abolfathi Momtaz Y, Hamid TA, Ibrahim R. Theories and measures of elder abuse. *Psychogeriatrics*. 2013 Sep; 13(3): 182-8.
  16. Nagaraj K, Mattoo KA, Brar A. Self-Neglect associated with a patient having oral cancer. *Journal of Medical Science and Clinical Research* 2014 ;2(10): 2543-46
  17. Sindi AS, Mittal R, Mattoo K, Deep A, Khateeb SU, Algarni YA, Baba SM, Hakami AM. Impact of an Auditory Mediated Patient Health Education (PHE) Program on Treatment Compliance and Satisfaction Among Patients Seeking Prosthodontic Care During COVID Pandemic—A Prospective Interventional Study. Patient preference and adherence. 2022:1247-55.
  18. Soneja, S. Elder Abuse in India: Country Report for World Health Organization; HelpAge: New Delhi, India, 2001
  19. Mattoo KA, Shalabh K, Khan A. Prevalence of elder abuse among completely edentulous patients seeking complete denture prosthesis – A survey. *J Indian Acad Geriatr*. 2009; 5(4):177-180
  20. Krug EG, Mercy JA, Dahlberg LL, Zwi AB. The world report on violence and health. *The lancet* 2002;360 (9339): 1083-8.
  21. Sooryanarayana R, Choo WY, Hairi NN. A review on the prevalence and measurement of elder abuse in the community. *Trauma, Violence, & Abuse* 2013;14(4): 316-25.
  22. Fulmer T, Paveza G, Abraham I, Fairchild S. Elder neglect assessment in the emergency department. *Journal of Emergency Nursing*. 2000;26(5):436-43.
  23. Hoover RM, Polson M. Detecting elder abuse and neglect: assessment and intervention. *American Family Physician*. 2014;89(6):453-60.
  24. Mattoo K, Garg R, Singh V. A Brief Review of Current Interventions in Elder Abuse and Neglect. *American Journal of Medical Case Reports*. 2023;11(5):90-4.
  25. Schofield MJ, Powers JR, Loxton D. Mortality and disability outcomes of self-reported elder abuse: A 12-year prospective investigation. *J. Am. Geriatr. Soc*. 2013; 61:679–685.
  26. Wiseman M. The role of the dentist in recognizing elder abuse. *J Can Dent Assoc* 2008; 74:715–720.
  27. Mattoo KA, Garg R, Kumar S. Geriatric forensics – part 2: Prevalence of elder abuse and their potential forensic markers among medical and dental patients. *Journal of Forensic Dental Sciences* 2015; 7(3):201-06
  28. Kim JH, Knight BG, Longmire CV. The role of familism in stress and coping processes among African American and White dementia caregivers: effects on mental and physical health. *Health Psychology*. 2007;26(5):564.
  29. Gurland BJ, Fleiss JL, Goldberg K., Sharpe L., Copeland JRM, Kelleher JM. A semi-structured clinical interview for the assessment of diagnosis and mental state in the elderly. *The Geriatric Mental State Schedule*. 2. A factor analysis. *Psychol Med* 1976;6:451–459.
  30. Garg R, Mattoo KA, Dhingra S. Comparative clinical evaluation of elder abuse impact upon prosthesis maintenance in geriatric patients. *Gerontology And Geriatric Research* 2019; 2(1):119