

Fixed Bridge Prosthesis Management of Epileptic Patients

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ABSTRACT

Background: Epileptic patients in the course of seizures may suffer damage to or loss of teeth and other oral tissues. Moreover, they are at great risk during their seizures from aspiration of foreign bodies such as removable dental prosthesis or fragments of prosthesis. It is therefore, necessary to provide them a tooth replacement option that would be safe and not constitute a source of danger in the course of seizures.

Case Reports: Two patients are presented in this report that lost teeth as a consequence of trauma sustained during seizures. They both had porcelain-fused-to-metal (ceramo-metal) fixed bridge prostheses fitted to replace the missing teeth. The fixed bridges have been in service for seven years without damage despite the fact that the patients still have seizures at the same frequency as prior to treatment that are often associated with trauma to oral tissues.

Conclusion: Fixed bridge prostheses are a viable tooth replacement option for epileptic patients that do not pose any additional danger of being dislodged, swallowed or aspirated in the course of a seizure.

Keywords: Epilepsy, dental management, fixed bridge prosthesis

INTRODUCTION

Epilepsy has been described as a symptom of an underlying neurological disorder and is characterized by unprovoked seizures.^{1,3} The diverse nature of seizures has led to patients being said to have "one of the epilepsies".² An epileptic seizure is defined as a "transient paroxysm of excessive discharge of neurones in the cerebral cortex causing a stereotyped event in which an individual's awareness of the surroundings may be impaired and their behaviour altered, that is discernible to the person experiencing it or to an observer".⁴ Generally, a seizure has a sudden onset and a specific end-point lasting for brief periods of a few seconds to a few minutes. A post-ictal period of drowsiness and confusion frequently follows seizures, and some patients would sleep for a varied length of time. When a person has two or more unprovoked seizures, epilepsy is diagnosed.⁵ The epilepsy is usually considered active when a person has had a seizure within the last two years or is taking anti-epileptic medication.² The prevalence of active epilepsy worldwide is 4-6 per 1000 of the population and is more common in men and in developing countries.⁶⁻⁸ In Nigeria prevalence varying from 5.3-37 per 1000 have been reported.^{9,10} Brain damage due to birth injury, infection or a cerebrovascular accident

accounts for 25% of cases while 75% is idiopathic epilepsy in which there is no identifiable cause. There is a 2-5% lifetime risk of an individual developing epilepsy.²

The patients in the course of a seizure may have falls which can result in lacerations of soft tissues, fractures of the facial skeleton, subluxation of the temporomandibular joints and devitalization, fractures, subluxation or avulsion of teeth.¹¹ Such injuries may also result from patients making contact with objects, doors and walls during the course of a seizure. Epileptic patients who have seizure disorders are quite able to undergo routine dental care, however, the dentist should check that the patients are well, not tired, have taken their normal anti-epileptic medication and have eaten normally before starting any treatment.² Specific considerations for epileptic patients include the treatment of oral soft tissue side effects of their medications and correcting damage to their teeth that has occurred secondary to seizure trauma.¹² A thorough probe into the patient's health history is necessary. Jacobsen and Eden have presented relevant questions to ask dental patients who have epilepsy.¹² Most patients who have epilepsy know they have the disease but might be unwilling to disclose it because of stigmatization associated with the disease. In such cases, information on routine medications may alert the dentist to the presence of the disease in the patient. Dental and oral soft tissue examination may further reveal the presence of the disease. Epileptic patients have been shown to receive less dental treatment with significantly fewer restored teeth than the general population.¹³ Ogunbodede et al reported that almost half of the epileptic patients in their study required dental prophylaxis and equal number of them required various types of restorative treatments.¹⁴ They also reported that another source of injury among patients in Nigeria is the fact that a number of people insert a spoon or some other object between the patient's teeth during a seizure ostensibly to prevent biting the tongue. These objects contribute to fracture or loss of teeth especially the upper central incisors.¹⁴

The challenge of providing adequate oral restoration for aesthetic appearance and function in patients with epilepsy is the decision as to whether a removable prosthesis or fixed bridge should be given.^{2,13,16} Studies have shown that epileptic patients have a great risk of injury during their seizures of aspiration of foreign bodies such as removable dental prosthesis or fragments of prosthesis.^{2,15-18} Restorative treatment of most patients with epilepsy can be successfully performed in the dental clinic provided necessary precautions are taken. Suitable restorative treatment options have been recommended for the rehabilitation of the dentition of epileptic patients.^{13,16} Fractured anterior teeth can be repaired with composite resin and missing teeth should be replaced with dental

prostheses designed to minimize the risk for displacement of such prostheses or further damage.

This is a report of fixed bridge prosthesis management of two epileptic patients who presented with restorative challenges at the Conservation Clinics of the Lagos University Teaching Hospital, Lagos, Nigeria.

CASE PRESENTATIONS

Case 1

A healthy-looking 37-year-old Nigerian female presented at the conservation clinic of Lagos University Teaching Hospital with a complaint of a broken fabricated crown on a tooth. She is an old patient of the clinic. Her teeth were traumatized when she accidentally banged her head against a wall in a darkened room three months prior to the date of presentation at the clinic. She also sustained injury to her upper lip and gum that resulted in pain, bleeding and swelling that subsided in three days. She also complained that the artificial crowns on her maxillary incisors were discoloured (Figure 1a).

The patient is a diagnosed epileptic patient who uses two types of antiepileptic drugs; carbamazepine (Tegretol) 2 tablets eight hourly and Primidone (Mysoline) tablet nocte. The seizures are of the tonic-clonic type. She claimed the seizures started in infancy and she has been on medication for several years. She has been able to associate occurrence of seizure with non-compliance to medication, hunger, stressful situations and menstruation. She said her seizures happen during sleep and she is able to know that she has had one by waking up with a slight headache and joint pains. Her last seizure was about two weeks before she presented at the clinic while the penultimate attack was two months before the last attack. She traumatized her maxillary central incisors (teeth 11 and 21) during a seizure attack 15 years prior to the current presentation. The maxillary central incisors had been endodontically treated and restored with cast post-core and acrylic crowns. She had changed the acrylic crowns about three times in 10 years because they often get discoloured.

Oral examination revealed plaque accumulation around the neck of some teeth with inflamed marginal gingiva and discoloured acrylic crowns on teeth 11 and 21. Tooth 11 was tender to percussion and had second degree mobility. She had missing third molars from all quadrants of the jaws and lower anterior teeth crowding. No carious tooth was seen and she tends to salivate profusely. Periapical and standard occlusal radiographs were taken. Radiographs confirmed presence of root filling extending to the apex of the roots and parallel sided post and core on teeth 11 and 21. Also evident on the radiographs was oblique fracture of the root of tooth 11.

Our treatment plan for this patient was extraction of the fractured tooth 11, provision of fixed prosthesis and three monthly oral prophylaxis. The treatment plan was explained to the patient emphasizing the need for more frequent oral prophylaxis. She was encouraged to take her medication as prescribed by her physician and to return to the clinic the next day to commence her treatment. On day two, she had oral prophylaxis done and impressions of her upper and lower jaws and teeth taken for laboratory fabrication of an immediate 3-unit acrylic temporary bridge. On the third day, tooth 12 was prepared as an abutment to receive a porcelain-fused-to-metal crown as retainer in the 3-unit bridge (Figure 1b). The extraction of fractured tooth 11 was done (Figure 1c), haemostasis was achieved, the acrylic crown on tooth 21 was removed and the temporary

bridge was fitted (Figure 1d). Patient was seen after three weeks for fitting of the definitive porcelain-fused-to-metal bridge when the extraction site had fully epithelized (Figure 1e&f).

Patient was advised not to sleep on a bed but to place her mattress on the floor. This advice was given to minimize the chances of damage to her dentition and prostheses during her seizures. This was especially important in this case since she claimed her seizures occur during sleep. The only intra-oral problem seen at her recall visits is that plaque control is inadequate. This patient has had her fixed prosthesis intact for seven years despite the fact that she still has her seizures at the same frequency as before placement of the tooth replacement.

Case 2

A healthy-looking 21 year-old Nigerian female presented at the Conservation clinic of Lagos University Teaching Hospital complaining of missing anterior teeth. She lost two maxillary anterior teeth during a seizure 6 months prior to her presentation at our clinic. She is a diagnosed epileptic patient on monotherapy anti-epileptic drug; phenytoin. She admitted to using local herbal concoction as well. Description of her seizure type fits a tonic-clonic class of seizure. Her seizures started when she was in her teens and she claimed seizures often start suddenly without any aura. She said the seizures were frequent, occurring in intervals of two months.

Oral examination revealed minimal plaque accumulation around her teeth and the oral soft tissue appeared clinically normal. All teeth were present except teeth 11 and 21 that is, upper right and left central incisors (Figure 2a). She had no carious cavities and no previously filled teeth and had never been to the dentist before.

Our treatment plan for this patient was to provide a fixed prosthesis and encourage six monthly visits for oral prophylaxis. The treatment plan was explained to the patient with emphasis on the need for her to maintain good oral hygiene and bi-annual dental visits for oral prophylaxis. She was counseled to take her medication as prescribed by her physician and to return next day to the clinic to commence treatment. On day two, she had oral prophylaxis done and impressions of her upper and lower teeth taken for laboratory fabrication of a 6-unit acrylic temporary bridge spanning from maxillary right to left canines. On the third day, teeth 12 and 13 were prepared as abutments to receive porcelain-fused-to-metal crowns as retainers in the 6-unit bridge and the teeth were temporized using single polycarbonate crowns. On the fifth day, teeth 22 and 23 were prepared and the laboratory fabricated temporary acrylic bridge was fitted after removing the temporary crowns on teeth 12 and 13. Patient was seen after three weeks for fitting of the definitive porcelain-fused-to-metal bridge (Figure 2b). In treating this patient, the tooth preparation was done in phases so that time spent on the dental chair was not too long and she was encouraged to indicate when she feels she could not cope any longer with the treatment at each visit.

This patient has had her fixed prosthesis for seven years. At the seventh year review the patient still had the prosthesis intact despite injuries sustained to lips, oral soft tissues and other teeth as a consequence of frequent seizures. Her oral hygiene remained fair even though she has been attending the clinic for her bi-annual oral prophylaxis. The patient still has seizures which are as frequent as before placement of the tooth replacement prosthesis.

Figure 1: Case 1

A: Discoloured and chipped crowns on teeth nos. 11 and 21. B: Tooth no 12 prepared for PFM crown, metal post-core on tooth no 21 and extraction socket of tooth no 11. C: Fragments of extracted fractured tooth no. 11. D: Temporary acrylic bridge cemented in place. E: Extraction site of tooth no 11 well-epithelised and healed. F: Definitive 3-unit PFM bridge fitted with retainers on teeth nos.12 & 21 and pontic replacing tooth no. 11.

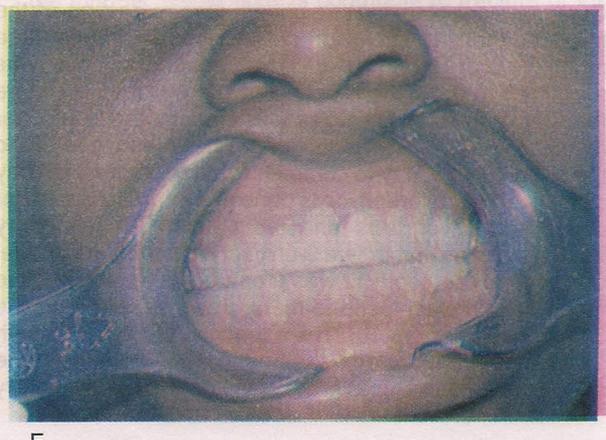
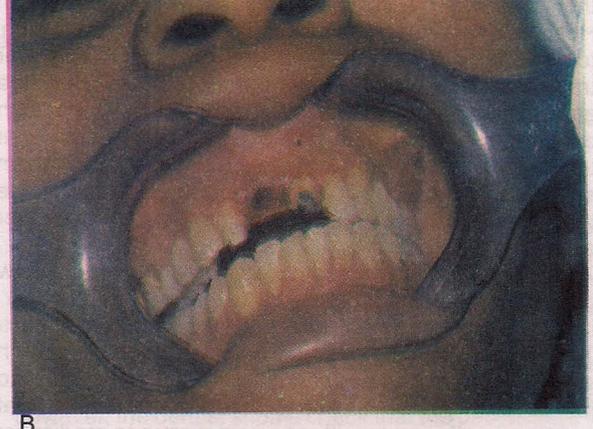


Figure 2: Case 2

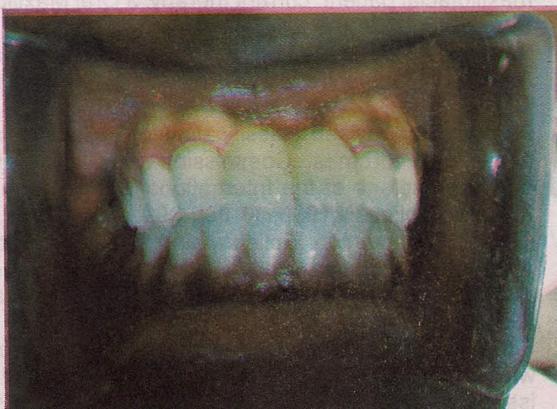
A: Missing teeth nos. 11 and 21, and abutment teeth nos. 12, 13, 22 and 23 prepared to receive ceramo-metal crowns as retainers. B: Temporary acrylic bridge cemented in place. C: 6-unit porcelain-fused-to-metal (ceramo-metal) bridge fitted. D: Seizure-associated lacerations on upper lip which occurred post-treatment without damage to ceramo-metal bridge.



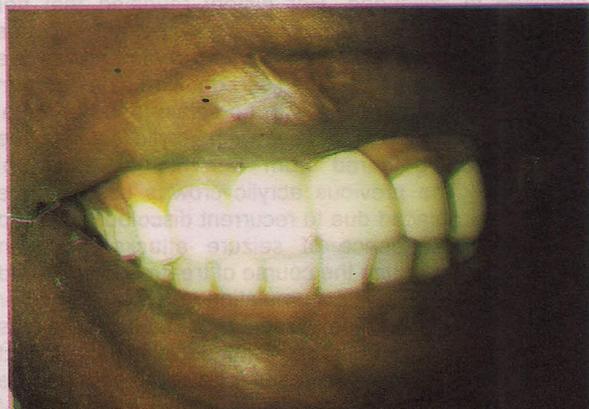
A



B



C



D

DISCUSSION

Dental management of epileptic patients requires an understanding of the disease including the various classified types, their presentations and medications used by the patients. Epilepsy seizures of unknown aetiology are classified as cryptogenic, idiopathic or primary while seizures of known aetiology are classified as acquired, symptomatic or secondary epilepsy. Symptomatic epilepsy can be as a result of metabolic, structural and functional abnormalities.⁶ In 1989, the International League Against Epilepsy (ILAE) developed a revised classification of epileptic seizures.⁵ This classification is based on clinical presentation and use of diagnostic tools such as electroencephalography (EEG) and magnetic resonance imaging (MRI). All seizures are broadly classified as partial and generalized seizures while partial seizures are further classified into simple and complex. A third main group is the unclassified seizures which are difficult to fit into a single class⁵. A seizure is classified as partial when the electrical

discharge causing it occurs in a specific area of the brain. A partial simple seizure further indicates that there is no loss of consciousness while in a partial complex seizure, there is loss of awareness. Generalized seizures occur when the discharge affects the entire brain cortex and they are further classified as absence, myoclonic, clonic, tonic, tonic-clonic and atonic types of seizures. Epileptic patients are treated mainly with anticonvulsant medications including traditional drugs such as phenytoin, phenobarbital, primidone, carbamazepine and valproate while several newer drugs are also now available. Monotherapy using a single drug is preferable to polytherapy which can be used in patients not successfully treated with single drug. Surgery is another treatment option used for patients who are refractory to anticonvulsant medications. Focal resection, corpus callostomy, hemispherectomy and multiple subpial transaction are surgical procedures that are acceptable.¹⁹

Dental treatment of most patients having epilepsy can be successfully performed in the dental clinic provided

the seizure type, known triggers and medications will give an indication of patient stability.¹² Management of the patients in this report (cases 1 and 2) involved a thorough probe into their history to ascertain their seizure type, frequency of seizures, known triggers and medications. This gave us an indication of patient stability and suitability for the proposed treatment plan. Treatment was done in phases so that time on the dental chair was not too long and they were encouraged to indicate when they feel they cannot cope any longer with the treatment at each visit. Both patients' dentitions were rehabilitated with fixed prostheses.

Fixed prosthesis or implants are preferable to removable appliances because the removable appliances can be dislodged during a seizure and cause oral injury or airway obstruction.¹⁵⁻¹⁸ If removable prostheses are unavoidable, they should be constructed with metallic bases rather than acrylic and the anterior denture teeth should have metal backing.^{13,16} Acrylic dentures when used should be reinforced with wire mesh.¹³ Fixed prostheses should have all-metal units where aesthetically possible to minimize the chance of porcelain fracture and additional abutment teeth should be used for more retention and stability. In the anterior, porcelain-fused-to-metal crown is used, though metal crown with acrylic or composite facing may be used to facilitate repair as needed.^{13,16}

The patient presented as case 1 in this report had been living with epilepsy for over 35 years having been diagnosed in childhood. Her history revealed that her traumatized teeth were initially as a result of her seizures though the current reason for prosthetic treatment was due to trauma not related to her medical condition. The decision to rehabilitate her dentition with porcelain-fused-to-metal crowns rather than a metal crown with acrylic facing is due to information gathered from her history and oral examination. The previous acrylic crowns used by the patient were replaced due to recurrent discolouration and not as a consequence of seizure attacks. Also on examination and during the course of treatment, we found that this patient's plaque accumulation rate is high and her control of it is poor. The soft tissue of the saddle area was always inflamed. Of importance in our decision was the fact that having used fixed prostheses for over 15 years, there had not been any incidence of traumatic dislodgement of the prostheses during seizures. We also considered the financial situation of this patient. She needed a prosthesis that will be safe in the long term and also cost effective, not needing to be replaced or repaired every few years due to discolouration or wear. The use of acrylic facing on metal crowns may heighten plaque accumulation with resultant periodontal breakdown of the supporting tissue of the teeth causing periodontal failure of the abutment teeth.

Intra-oral examination of patient reported as case 1 did not reveal any oral complication of anti-epileptic drugs. This patient was on carbamazepine (Tegretol) and Primidone (Mysoline) tablets. Xerostomia and stomatitis have been reported as a side effect of carbamazepine.¹⁶ However, this patient salivates readily and her oral soft tissue appeared clinically normal except for areas of inflamed marginal gingivae in relation to plaque accumulation. Overall, this patient successfully received dental care because necessary recommended management protocol for epileptic patients was employed.¹⁶ The fixed prosthesis provided for this patient is still intact after seven years of use even as she continues to have her seizures.

The patient presented as case 2 in this report also had fixed prosthetic replacement of her missing maxillary central

incisors with a porcelain-fused-to-metal 6-unit bridge. Additional abutments were included for stability. Porcelain-fused-to-metal crowns 6-unit bridge was provided because the patient claimed she will be unable to afford recurrent replacement of acrylic crowns or facing. The prosthesis is still being used by patient for the past seven years with no incidence of dislodgement, fracture or debonding of porcelain from metal substructure.

CONCLUSION

Fixed bridge prostheses are a viable tooth replacement option for epileptic patients that do not pose any additional danger of being dislodged, swallowed or aspirated in the course of a seizure. Dental management should be tailored to individual peculiarities of the patients along with observance of the recommended standard protocol for epileptic patients.

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Abstract

Objective: The aim of this study was to evaluate the prevalence of left ventricular hypertrophy (LVH) in patients with non-dominant diabetic mellitus (NDM) and to compare it with the prevalence of LVH in patients with dominant diabetic mellitus (DM).

Methods: A total of 100 patients with NDM and 100 patients with DM were included in the study. All patients underwent a 24-hour ambulatory blood pressure monitoring (ABPM) and an echocardiographic examination. The prevalence of LVH was determined by the presence of a left ventricular mass index (LVMI) greater than 125 g/m² in men and 100 g/m² in women.

Results: The prevalence of LVH was significantly higher in patients with DM (75%) compared to patients with NDM (45%). The prevalence of LVH was also significantly higher in patients with a longer duration of diabetes (p < 0.05).

Conclusion: The prevalence of LVH is significantly higher in patients with DM compared to patients with NDM. The prevalence of LVH is also significantly higher in patients with a longer duration of diabetes.

Keywords: Left ventricular hypertrophy, non-dominant diabetic mellitus, dominant diabetic mellitus, echocardiography, ambulatory blood pressure monitoring.

Introduction: Left ventricular hypertrophy (LVH) is a common cardiovascular disease associated with increased morbidity and mortality. It is characterized by an increase in the size and mass of the left ventricle. The prevalence of LVH is higher in patients with diabetes mellitus (DM) compared to patients without DM. The aim of this study was to evaluate the prevalence of LVH in patients with non-dominant DM (NDM) and to compare it with the prevalence of LVH in patients with dominant DM.

Methods: A total of 100 patients with NDM and 100 patients with DM were included in the study. All patients underwent a 24-hour ambulatory blood pressure monitoring (ABPM) and an echocardiographic examination. The prevalence of LVH was determined by the presence of a left ventricular mass index (LVMI) greater than 125 g/m² in men and 100 g/m² in women.

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