

Case Report

A comprehensive oral and dental management of an epileptic and intellectually deteriorated adolescent

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ABSTRACT

Epilepsy along with intellectual deterioration and other neurological disorders can have social, physical, and psychological consequences, especially, when they begin in childhood. Moreover, the seizure episode along with mental deterioration may compromise the oral and dental care resulting in numerous decayed teeth. This report presents the case history of an adolescent with poor oral hygiene and numerous decayed teeth. This report also presents the comprehensive endodontic, surgical, and prosthodontic management of epileptic mentally challenged patient in the dental office. Epilepsy along with intellectual deterioration and other neurological disorders can have social, physical, and psychological consequences, especially, when they begin in childhood. Moreover, the seizure episode along with mental deterioration may compromise the oral and dental care resulting in numerous decayed teeth. This report presents the case history of an adolescent with poor oral hygiene and numerous decayed teeth. This report also presents the comprehensive endodontic, surgical, and prosthodontic management of epileptic mentally challenged patient in the dental office.

Key Words: Children, decayed teeth, epilepsy, mental retardation

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INTRODUCTION

Epilepsy is defined by the World Health Organization (WHO),^[1] as a chronic affection of multiple etiologies, characterized by recurring episodes of paroxysmal brain dysfunction caused by a sudden disorderly and excessive neuronal discharge. It is a chronic disease characterized by the risk of recurrent seizures; its prevalence in developing countries like India being 5.59 per 1000 people^[2] and that in developed countries, being 5-7 per 1000 people.^[3] Anyone can be affected by seizures; in fact, up to 5% of the world's population may have experienced a single seizure at some point in their lives.^[1,4] A WHO publication^[1] has estimated the

mean prevalence of active epilepsy to be approximately 8.2 cases per 1000 in the general population.

According to the International League Against Epilepsy,^[5] epilepsy is diagnosed when a person has two or more unprovoked seizures. A seizure is classified as "partial" when the electrical discharge causing it occurs in a specific area of the brain or "generalized" when the discharge affects the entire brain cortex. When there is loss of awareness, seizures are termed complex [Table 1]. It is also classified based on the cause, and it can be symptomatic (caused by a developmental malformation), idiopathic (when a genetic condition is responsible) or cryptogenic (when the cause is unknown).^[5]

The elective treatment usually involves the administration of the appropriate antiepileptic drugs (AEDs) (phenytoin, carbamazepine, valproic acid, phenobarbital, primidone, and others) for the type of seizure.^[1,4] However, a number of drugs used in seizure control have implications for oral care and dental treatment.^[6,7]

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Table 1: Simplified version of the classification of seizures according to the International league against epilepsy

Partial seizures
Simple partial seizures (awareness not impaired)
With minor signs (focal motor, versive, phonatory)
With somatosensory or special-sensory symptoms (somatosensory, visual, auditory, olfactory, gustatory)
With autonomic symptoms
With psychic symptoms (déjà vu, illusions, hallucinations)
Complex partial seizures
With simple partial onset followed by impairment of awareness
With impairment of awareness at onset
Partial seizures evolving to secondarily generalized seizures
Simple partial seizures evolving to generalized seizures
Complex partial seizures evolving to generalized seizures
Simple partial seizures evolving to complex partial and then to generalized seizures
Generalized seizures
Absence seizures
Myoclonic seizures
Clonic seizures
Tonic seizures
Tonic-clonic seizures
Atonic seizures
Unclassified seizures

When severe epilepsy may be accompanied by physical, mental, and intellectual deterioration. In most developing countries such as India, epilepsy is erroneously believed to be infectious and/or caused by evil spirits.^[8] As a result, patients with epilepsy are stigmatized and ostracized. This attitude adversely affects the interpersonal relationships, education, career/employment opportunities, and the general health of patients.^[8] Self-care is essential to one's oral health; however, due to the unsupportive environment of many persons with epilepsy, oral health and hygiene procedures are often neglected.^[9] Therefore, the aim of this article is to present a case report and describe the oral and dental rehabilitation of an adolescent with neglected oral hygiene, numerous grossly decayed teeth, and deranged occlusion related to recurrent epileptic episodes with intellectual deterioration.

CASE REPORT

A 15-year-old right-handed boy, accompanied by his mother, arrived at the Pediatric Dentistry Department, Rural Dental College, Loni after seeking treatment without success in a private dental clinic. His chief complaint was pain in the upper front region of jaw associated with front teeth.

During history taking, the mother reported that the patient's "crises" began at 6 years of age. Since then, there have been frequent episodes in which he turned his eyes up, shook, stiffened, contorted his body, and clenched his fists. She could not ascertain if there was any loss of consciousness, during these episodes. She had consulted a pediatrician and a neurologist for evaluation of his general and neurological evaluation. Neurological examination reports revealed that, the patient presented with some spontaneous myoclonic jerks of right and left arms. The diagnosis of right and left focal epileptic fits, which were secondarily generalized was made. Language and learning difficulties were diagnosed as the patient had been repeating his fifth grade for 5 years. Medical reports also revealed that the patient was initially on carbamazepine 200 mg twice/day and risperidone 1 mg/day for 6 years. The drug therapy was changed at the age of 12 years by discarding the risperidone and increasing the carbamazepine dosage to 600 mg/day. The mother did not understand that a diagnosis of epilepsy had been made because of her lack of education. Patient's routine hematological investigations were within the normal limits.

Oral examination and dental management

At first dental visit patient was extremely anxious about the dental clinical environment. The patient was relaxed by the dental staff and nurses. He was introduced to the dental equipment's in a stepwise manner. Tell-show-do approach was very helpful in this patient. The oral examination revealed numerous grossly decayed teeth with poor oral hygiene [Figure 1]. Root stumps were present for 31, 32, 41, and 42. Endodontic treatment was carried out for 21 and 22 by the previous dentist with iatrogenic mishaps. Intraoral periapical radiographs revealed extruding gutta-percha point beyond the apical foramen in association with 21 and a broken endodontic file at the apical 3rd of 22 [Figure 2]. The patient had underwent extractions of first permanent molars in 3rd and 4th quadrants by the previous dentist at the age of 14 years. The patient's dental occlusion was entirely deranged. The case was diagnosed as adolescent dental caries with special health-care needs. Treatment plan was formulated for the patient with following goals in mind:

- Education and motivation of the parent for improvement of patient's oral hygiene
- Minimizing the pain in maxillary anterior region
- Reducing and treating other carious teeth



Figure 1: Frontal view showing numerous grossly decayed teeth

- Stabilizing the occlusion
- Improving the masticatory efficiency
- Improving the salivary flow rate
- Improving the overall oral health.

Patient's parent was informed about the diagnosis, were explained about the treatment plan and the need for endodontic, surgical, and prosthetic rehabilitation. After the motivation of the parent, they were willing for the treatment and were ready to keep up the appointments. In the initial appointments, a thorough oral prophylaxis was carried out, and 0.12% chlorhexidine oral rinses twice daily were prescribed at home. A salivary substitute like mouthkote solution was prescribed to minimize the oral dryness.

After obtaining the neurologist's consent, the blood reports, and under an antiepileptic drug regime, endodontic surgery was planned for 21 and 22 along with endodontic retreatment for the same. Following oral prophylaxis and administration of a local anesthetic (lignocaine and adrenaline injection I.P. (Harson Laboratories, Baroda, Gujarat, India) a semilunar incision was placed with no. 15 blade on the attached gingiva extending from mesial aspect of 21 and until the distal aspect of 22. A bony window was made with surgical round carbide bur (no. 8R, SS White Company, Dental Avenue India, Pvt. Ltd., Mumbai, India) mounted on a slow speed handpiece (NSK, PANA AIR; Nakanishi Inc., Shimohinata, Tochigi-Ken, Japan) under copious normal saline irrigation [Figure 3]. The extruded gutta-percha was excised from the apical 3rd of 21. Furthermore, the broken endodontic file was removed from the apical 3rd of 22. A complete curettage of the area was carried out followed by suturing of the flap with 3-0 non-resorbable black

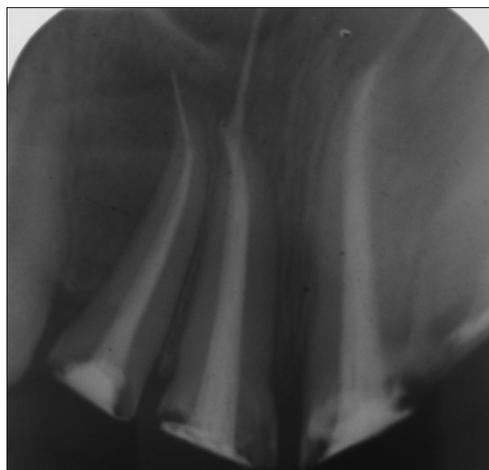


Figure 2: Intraoral periapical radiograph showing extruded gutta-percha beyond the root apex of 21 and broken endodontic instrument at the apex of 22

surgical silk suture (Ethicon, Johnson and Johnson Ltd., Mumbai, India) [Figure 4]. The endodontic treatment was repeated with 21 and 22 followed by treatment with 11 and 12. Postoperatively antibiotics and analgesics were prescribed for 5 days. Patient's pain was relieved completely after the endodontic surgery, and endodontic treatment and the healing of the surgical area was uneventful.

The clinical crowns of maxillary incisors were compromised as a result of caries, hence prior to planning for extracoronary fixed restorations on these teeth, and it was mandatory to restore them with custom made the post and core. The 2/3rd of gutta-percha was removed from the endodontically treated maxillary incisors root canals with the help of no. 2 Peeso reamer (Prime Dental Products, Mumbai, India) for post-space preparation. Post-space impression was made using blue inlay wax (Inlay Wax Medium, GC Corporation, Tokyo, Japan) along with the fabrication of core with the blue inlay wax for the four maxillary incisors. The casting was carried for the impressions of post and core. The custom made the post and core were trail fitted on the four maxillary incisors and then were cemented with Type 1 Glass Ionomer cement (GC Corporation, Tokyo, Japan) [Figure 5]. Extra-coronary porcelain fused metal (PFM) restorations were given on the four maxillary incisors after [Figure 6]. Meanwhile, extractions of the anterior root stumps in the lower arch were carried out. All the procedures were carried out under antiepileptic medication, with Neurologist's and Parental consent. The extraction sockets were allowed to heal till a period of 4-6 weeks.



Figure 3: Semilunar incision placed on the attached gingival with 21 and 22



Figure 4: Flap placed in position and sutured

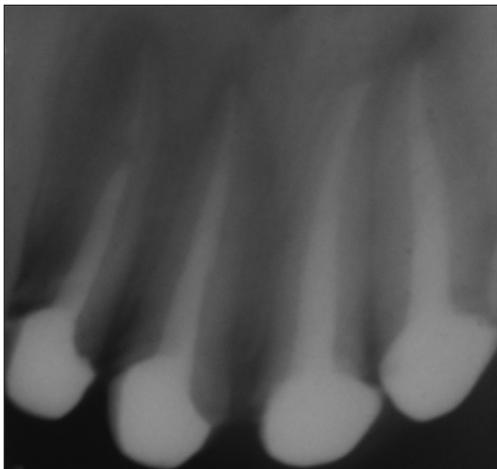


Figure 5: Intraoral periapical radiograph showing the custom fabricated posts and core cemented in the roots of 11, 12, 21, and 22

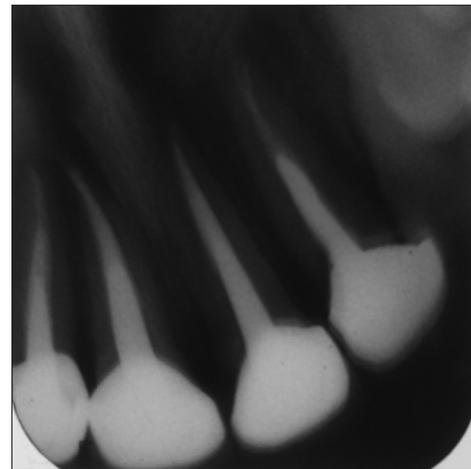


Figure 6: Intraoral periapical radiograph showing the porcelain fused metal crowns cemented on the custom fabricated post and cores

After the complete healing of the extraction sockets, diagnostic impressions were made for the arches using irreversible hydrocolloid (Alginate) impression material (Imprint Alginate Impression Material, Mumbai, India). Special tray was fabricated on the diagnostic cast for the dual impression technique. After border molding and final impression of mandibular edentulous region under physiological loading, using non-eugenol impression paste (IMAGE, Eugenol Free Impression Paste, Prime Dental Products, Mumbai, India) and the anatomical (dentulous) region was recorded using alginate pick up impression [Figure 7]. The master casts were obtained, and a surveying of the master casts revealed larger amount of lingual undercuts, so a labial flange flexible denture was planned. After blocking out of all the undercut areas and the diagnostic wax up, Face bow transfer was carried out, and centric jaw

relation was recorded. The jaw relation record was quite difficult for this patient and required repeated training at home by the parent as well as in the dental operatory by the dentist. Try-in was carried out after the teeth arrangement. A flexible Valplast partial denture (Katara Dental Laboratories, Mumbai, India) was fabricated and was inserted in the lower arch [Figure 8]. Patient's comfort, speech, and acceptance for the treatment were assessed. The patient and his parent were happy and satisfied with the treatment being carried out. There was a significant improvement in the speech as well. The entire treatment was completed in 8 months due to intellectual deterioration of the adolescent. After the insertion of removable prosthesis to the patient, it needs to be changed after a period of 6-8 months until the age of 17-18 years unless the maxillo-mandibular growth of the patient is ceased. The patient was regularly



Figure 7: Alginate pick up impression

followed-up every month.

DISCUSSION

Epileptic mentally retarded child and adolescent require special considerations during the medical and dental treatment. WHO data suggested that psychiatric and neurological disorders, including epilepsy, are among the most significant contributors to the global burden of human suffering.^[1] Epilepsy usually begins in childhood, potentially impeding education, employment, social relationships and the development of a sense of self-worth.^[4] In the present case, the disorder began when the patient was 6 years old and affected his cognitive skills.

In an epidemiologic study Karolyhazy *et al.*,^[10] found that, compared to healthy subjects, patients with epilepsy showed significantly worse oral health and dental status. According to these authors, the higher index of dental disease – including caries, injury, and periodontal disease – is a consequence of the combined effect of neglected oral hygiene, oral cavity injury, and socioeconomic background.

The patient described here was diagnosed case of generalized form of epilepsy with mental retardation and on Carbamazepine since the age of 6 years. Dentists should always remember that the patients consuming carbamazepine for a prolonged period have thrombocytopenia, dizziness, drowsiness, and headache. The oral complication is xerostomia, increased incidence of microbial infections, delayed healing, and excessive bleeding.^[11] In the present case, blood reports were within normal limits. The patient described here had reduced salivary flow, deficient



Figure 8: Final flexible valplast denture insertion

oral hygiene and his intellectual deterioration made mechanical removal of dental biofilm difficult, leading to the development of gingivitis, and generalized dental caries. Considering these issues, the patient's dental treatment plan included fluoride therapy and reinforcement of oral hygiene habits at every visit to the dental clinic.

Management of the mentally deteriorated epileptic patient is a challenge for every dentist and needs a proper treatment plan. The dental history revealed the iatrogenic mishap of 21 and 22. Hence, the endodontic surgery was planned in this case to remove the extruded gutta-percha from the apical 3rd of 21 and broken instrument from the apical 3rd of 22. Endodontic retreatment for 21 and 22 along with 11 and 12 was carried out with custom made the post and core. Extra coronal fixed PFM restorations were given on the maxillary incisors in the present case. Fixed prostheses are always preferred over removable partial dentures because of the danger of seizure-related injuries and aspiration.^[7,12] If a removable denture is unavoidable, then a metal base is preferred, to minimize the chances of fracture.^[12] In the present case, patient presented with severe lingual undercuts in the mandibular anterior region. Hence, a flexible valplast partial denture, instead of metal based denture, was preferred.^[13] In the present case, flexible partial denture had added advantages of being comfortable for the patient, unbreakable during an epileptic episode, improved the masticatory efficiency and the oral hygiene maintenance was easier.^[13] This young adolescent has to be seen regularly after initial prosthesis delivery until his growth is complete, to resolve the problems related to this factor. Most common problems are usually related to the loss of prosthesis retention or occlusal changes

caused by jaw growth.^[14] Nowak recommends that the parent should be briefed on these types of changes in advance and informed that when the growth and development are complete, a more permanent treatment can be rendered.^[14]

The use of conscious sedation and general anesthesia is not contraindicated in patients with epilepsy. In some situations nitrous oxide or intravenous sedation may be necessary to safely and effectively provide dental care.^[12] However, in our case, we did not advocate sedation for managing the patient who required surgical, endodontic and prosthodontic rehabilitation since the ultimate success of treatment depends on patient understanding and compliance. Instead of sedation, Nowak^[12,14] advocates conditioning to the pending dental procedures by “tell-show-do” approach, which was used successfully during the treatment of our patient.

During all the dental visits, patient and parent were motivated for good oral hygiene practices.

To minimize the seizures due to stress and anxiety, appointments were scheduled during a time of the day when seizures activity is less likely to occur.^[7] A seizure triggering factor like operating light on the eyes was prevented by using dark glasses. Treatment procedures were carried out only after the patient consume AEDs.^[7] Neurologists and pediatricians consent were taken during the entire treatment protocol.

CONCLUSION

Epileptic patients have a variety of unique medical and dental needs. These patients can be safely managed in a general dental office by an informed practitioner. A good health history to fully understand the patient’s disease, and the medications they are taking is essential. A proper oral examination to uncover any dental problems and possible oral effects of anti-epileptic drugs is necessary. Some simple and straightforward treatment planning considerations will ensure the patient’s oral health is properly maintained.

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