Research Article

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Prosthetic Management of HIV/AIDS Patient: A Case Report

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ABSTRACT

Background: Provision for the expectations of oral health care is a basic prerequisite for any person and dentists perpetually attempt to give ideal treatment to their patients. Nonetheless, with regards to treating subjects with infectious diseases especially those connected with social stigma like HIV/AIDS, there remain questions and waverings. This might lead the practitioners to breach the moral obligation by denying or not giving sufficient treatment to these patients. Such circumstances can without much of a stretch be maintained a strategic distance from with intensive information and mindfulness among the oral health care providers including prosthodontists regarding disease process, its suggestions and measures to be taken during their treatment This article summarises key focuses in prosthodontic management of HIV/ AIDS patients that within the opinion of the author is also simply incorporated in routine practice. Among the various dental treatments provided, prosthetic rehabilitation is an indispensable part and in spite of the fact that the prosthodontists are defied with an expanding number of HIV infected patients there remains vulnerability with respect to acceptable management protocol for them. The following section provides a brief summary of the prosthodontics consideration for the individuals living with HIV/AIDS and some key points for the prosthodontists to enhance oral health care provision in these subjects.

Keywords: Oral health, HIV, Edentulous, Denture, Barrier technique, Disinfection, Sterlization, Opportunistic infections, Universal precautions.

INTRODUCTION

The human immunodeficiency virus (HIV) is grouped to the genus Lentivirus within the family of Retroviridae, subfamily Orthoretrovirinae.[1] Human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS) are considered as global pandemic, which have been a part of world's experience since 1981. [2] In accordance with WHO, HIV continues to be a major global public health issue, having claimed more than 35 million lives so far. In 2017, 9.4 million people died from HIV-related causes globally. At the end of 2017 there were approximately 36.9 million people living with HIV whereas 1.8 million people were becoming newly infected globally. [3]

The Human Immunodeficiency Virus (HIV) weakens the defence system of body against infections by targeting the immune system. An infected person becomes immune-deficient as the virus destroys and impairs the function of immune cells which is measured by CD4 cell counts. There is no cure for HIV infection. However, the virus can be controlled by antiretroviral drug which helps to prevent transmission so that people with HIV, and those at substantial risk, can enjoy healthy, long and productive lives. In year 2017, 59% of adults and 52% of children living with HIV were receiving lifelong antiretroviral therapy (ART).[3]

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On the basis of genetic characteristics and differences in the viral antigens, HIV is classified into the types 1 and 2 (HIV-1, HIV-2). HIV-1 evolved from non-human primate immunodeficiency viruses from Central African chimpanzees (SIVcpz) and HIV-2 from West African sooty mangabeys (SIVsm).4 Based on their genetic make-up, HIV-1 viruses are divided into three groups (eg, M [main], N, and O group. These HIV-1 groups and HIV-2 probably result from distinct cross-species transmission events.5 The worldwide spread of HIV-1 indicates that the virus effectively counteracts innate, adapted, and intrinsic immunity.[6]

Despite its modest genome size (less than 10 kb) and its few genes, HIV-1 excels in taking advantage of cellular pathways while neutralizing and hiding from the different components of the immune system.[7] The HIV-1 life cycle is complex and its duration and outcome is dependent on target cell type and cell activation.[8] In the early steps, HIV-1 gains access to cells without causing immediate lethal damages but the entry process can stimulate intracellular signal cascades, which in turn might facilitate viral replication.[9] The two molecules on the HIV-1 envelope, the external glycoprotein (gp120) and the transmembrane protein (gp41), form the spikes on the virion's surface.[10] During the entry process, gp120 attaches to the cell membrane by first binding to the CD4+ receptor. Subsequent interactions between virus and chemokine co-receptors (eg, CCR5, CXCR4) trigger irreversible conformational changes. [11]

The actual fusion event takes place within minutes by pore formation and releases the viral core into the cell cytoplasm. After the core disassembles, the viral genome is reverse transcribed into DNA by the virus' own reverse transcriptase enzyme.8 Related yet distinct viral variants can be generated during this process since reverse transcriptase is error prone and has no proofreading activity.8 At the midpoint of infection, the viral protein integrate in conjunction with host DNA repair enzymes inserts the viral genome into gene-rich, transcriptionally active domains of the host's chromosomal [DNA12]

Many people with HIV/AIDS are in need to obtain routine dental care. As a general rule, no modifications are required in the treatment of HIV patients. The major area of concern is impaired hemostasis, susceptibility to dentally induced infections, drug actions and interactions and the patient's ability to withstand the stress and trauma of dental procedure. [13] Prosthetic rehabilitation is an essential part among all the various dental treatments provided. Although the prosthodontists are facing an increasing number of HIV infected patients, there remains unreliability with regard to proper protocol management for them. Cross contamination that could expand to dentists, dental office staff, dental technicians and patients can be prevented with the use of effective infection control procedures and precautions used in the dental office and dental laborartory. [14]

There is paucity of literature documenting on prosthetic management of HIV- patients during denture fabrication. This article provides a brief summary of the prosthodontic care for the people living with HIV/AIDS to improve their oral health care.

CASE HISTORY

A 62-year-old female patient with a positive history of HIV-infection, reported to the Department of Prosthodontics, Crown and bridges in Sudha Rustagi College of Dental Science and Research with a chief complaint of difficulty in eating due to loss of teeth. Patient wanted a new denture for better esthetic appearance and better chewing efficiency. On general examination, patient was found to be in fairly good general health without any sign of pallor, cyanosis, oedema and icterus. The face was symmetrical with prominence of zygomatic bones, sunken cheeks and mandibular prognathism. Temporomandibular joint examination showed no signs and symptoms of dysfunction and lymph nodes were non-tender and non-palpable.

On intra oral examination, there was no abnormality detected on tongue, buccal mucosa, labial mucosa, palate, floor of mouth and alveolar mucosa and did not showed any symptoms pathognomonic of HIV. The color of gingiva was pale pink with generalized melanin pigmentation. The patient was completely edentulous with respect to upper arch whereas mandibular right central incisor was missing in mandibular arch with mild to moderate plaque deposits.

5. Master cast

6. Immersion of master cast in korsolex rapid (2% glutaraldehyde) for 20 mins.

7. Denture base with occlusal rim fabricated over master cast

8. Immersion of master cast, denture base and occlusal rims in korsolex rapid (2% glutaraldehyde) for 20 mins.

9. Try-in of maxillary complete denture.

10. Denture insertion

11. Post-operative photograph of the patient

Treatment plan included fabrication of single maxillary complete denture following standard infection control protocol to treat HIV infected denture patient.

PROCEDURE

A complete medical history and complete blood examination was carried out before starting any clinical procedure. Written consent was obtained from patient after explaining the procedure. A systematic disinfection protocol was followed at all the steps of complete denture fabrication.

Standard protocol followed during each clinical appointment

- It included personal protective measures such as wearing:

  - Disposable Surgical gloves
  - Four ply mouth mask
  - Face shield
  - Head-cap
  - Disposable surgical gown

- Antimicrobial s

- urgical hand scrub which was used each time after completing clinical steps.

- Spray-wipe-spray technique with iodophor solution was used for surface disinfection and dental units were covered with plastic protective sleeves.

- Sterilization of the impression trays and instruments was done in autoclave at 121 degree centigrade for 15 minutes.

- Primary impressions were made with stock trays using impression compound (Y- dent, India). Impressions were disinfected with korsolex rapid solution (2% glutaraldehyde) solution for 15 minutes.

- Casts were poured in type III stone (Kalabhai, India) and then disinfected with korsolex rapid 2% solution for 15 minutes.

- A full spacer design was given in the maxillary cast and specials trays were fabricated from autopolymerization acrylic resin(DPI, India) with sprinkle-on technique.

- Border molding was done using green stick compound (DPI, India) following incremental technique and the secondary impressions were made using zinc oxide- eugenol paste (DPI) using standard prosthodontic protocol.

- Master casts were poured in type III stone (kalabhai, India) and disinfected with 2% glutaraldehyde (korsolex rapid) and a temporary denture base was fabricated with autopolymerising resin (DPI India) with sprinkle-on technique.

- Occlusal rims were fabricated to carry out jaw relations. After recording jaw relation, mounting was done.

- Try in was done for the verification of jaw relation and to evaluate fit, esthetics and maxillomandibular relations followed by Wax up of the trial denture

- Following standard prosthodontic protocol, flasking of the waxed up denture was done. The denture was processed in the lab following compression moulding technique.

- Lab remounting and selective grinding was done to remove any occlusal interferences followed by finishing and polishing of the denture.

- The maxillary complete denture was then inserted and post-insetion instructions were given. Patient was recalled after 24 hours and then after one week. Patient did not report of any discomfort during follow up visits.

DISCUSSION

Dental surgeons are exposed to a variety of microorganisms that are transmittable via blood, saliva or other body fluids and secretions. Among these, Blood has the greatest proportion of infectious viral particles [7]. Transmission is followed by an orderly appearance of viral and host markers of infection in the blood plasma. In the acute phase of infection, HIV-1 replicates exponentially and diversifies randomly, allowing for an unambiguous molecular identification of transmitted/founder virus genomes and a precise characterization of the population bottleneck to virus transmission. Acquired immune deficiency syndrome (HIV) gains entry into the body directly through the blood or mucosal surface. Not all the infected patients can be identified based on medical history, physical examination and laboratory investigation; hence, the philosophy is to consider all patients to be infected with this pathogenic organism and universal precautions should be followed. The virus establishes itself within lymphoid tissue, where it replicates and becomes available to the immune system[13].The particular immunodeficiency in HIV disease is attributed to CD4+ lymphocyte depletion, enabling the development of specific opportunistic

infection that is associated with a high degree of morbidity and mortality. Occupational exposure can occur percutaneously through needle stick or cuts from sharp instruments contaminated with infected blood or blood splashes to the eyes, nose or mouth. Any dental surgery exposes to cross infection with pathogens including HIV, hepatitis B and hepatitis C viruses. Therefore, the dental health care provider must be aware and well educated about the diseases commonly encountered during dental care. Attainment of standard oral hygiene is a basic requirement for any individual where dentists aim is to provide best treatment for their patients. However, when it comes to treat immunocompromised patients, there remain doubts and hesitations in treating them. The major area for concern is susceptibility to dentally induced infections, drug actions and interactions and also the ability of patient to withstand the stress and trauma of dental procedures. Thus, while performing simple procedures whether it be restorative treatment or fabrication of fixed or removable prosthesis, long term use and maintenance of a restoration or prosthesis should be considered. The use of effective infection control procedures and universal precautions in the dental office and dental laboratory will prevent cross-contamination that could extend to dentists, dental office staff, dental technicians and patients.[14] All the above-mentioned infection control protocols were strictly followed in this particular case report of fabricating single maxillary complete denture.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

CONCLUSION

Oral health should be an integral component of primary health care for all the patients with HIV. Dentists must use effective infection control procedure in their practices. The prosthodontic management of patients with HIV is made easy by simple protocols suggested in this case report. However, research in this field is confined and it is recommended that additional clinical relevant information must be acquired. Based on evidence, more details and improved guidelines can be developed that may facilitate in better patient care particularly in immunocompromised patients.

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