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RESEARCH ARTICLE

PRESERVATION OF RESIDUAL ALVEOLAR RIDGE USING TOOTH SUPPORTED OVERDENTURE PROSTHESIS- A CASE REPORT

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Abstract

Loss of alveolar bone is a great entity to be worried about after loss of natural teeth. Overdenture is a treatment modality in means of alveolar bone preservation; retention and stability of prosthesis by preserving the roots of the remaining teeth thereby increase the patient's perception, acceptance and quality of life. It is the most commonly treatment modality for elderly patient with two or more teeth remaining in the either arch. The use of copings and precision attachments on the remaining teeth enhances the retention of the denture. Dentists have a responsibility to prevent tooth loss whenever possible and everything should be done to keep the patient away from an edentulous state. Preventive prosthodontics emphasizes upon the importance of procedures that can delay or rectify the future problems in prosthesis and the overdentures are the optimum method to achieve this requirement. In this present case report described the rehabilitation of a patient with few natural teeth present using tooth supported overdenture which restored the function and evades the social stigma, thereby improving the quality of life of the patient.

Introduction:-

Usually conventional dentures are accepted initially but with passing year's patient become more intolerant of their prosthesis. Mainly due to resorption of basal bone coupled with a decline in patient's neuromuscular function (decrease in proprioception). An overdenture enables utilization of advances in periodontal and endodontic therapy to give a viable alternative to treatment. Overdenture is defined as " a removable partial or complete denture prosthesis that covers and rests on one or more remaining natural teeth, the roots of natural teeth and/or dental implants; is partially supported by natural teeth, natural tooth roots, and /or dental implants." (GPT9). A tooth supported overdenture is a dental prosthesis that replaces lost or missing natural dentition and associated structures of the maxilla and/or mandible which receives partial support and stability from one, more modified natural teeth. An over-denture delays the process of resorption, improves denture foundation area and increases masticatory efficiency. De-Van golden statement: "Perpetual preservation of what remains is more important than the meticulous replacement of what is missing" still rings true, holds true for such dentures. Over-denture is a definitely a better option as compared to a removable complete denture prosthesis, which certainly has its drawbacks. Overdenture is one of the most practical measures used in preventive dentistry. In a 4 years study by Renner et al., it was found that

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50% of the roots used as over-denture abutments remained immobile[1]. In this present case report described the rehabilitation of a patient with few natural teeth present using tooth supported overdenture which restored the function and evades the social stigma, thereby improving the quality of life of the patient.

Indications of tooth supported overdenture:
1. Patients with two or more teeth are remaining in the either arch.
2. It is also useful for patients with congenital defects such as oligodontia, cleft palate, cleidocranial dystosis and Class III occlusion.

Contraindications of tooth supported overdenture:
1. Hormonal imbalance leading to increased bone resorption.
2. Ridge atrophy.

Advantages of tooth supported overdenture:
1. Preservation of alveolar bone, enhanced proprioception, retention and stability and maintenance of vertical dimension.
2. Ease of converting to complete denture over a period of time.
3. Evading psychological trauma of edentulism.

Disadvantages of tooth supported overdenture:
1. Increased cost.
2. Time consuming requiring complex processing steps.
3. Oral hygiene maintenance to prevent caries and periodontal disease
4. Increased bulk.
5. Frequent recall check-ups.

Case report
A 63 years old male patient reported to the Department of prosthodontics and crown and bridge, Government Dental College, Thiruvananthapuram, with the chief complaint of missing teeth and wants replacement of missing teeth. Patient has a medical history of diabetes mellitus since12 years and on medication. Patient has past dental history of extractions of the grossly decayed and mobile teeth due to chronic generalized periodontitis.

Intraoral examination revealed partially edentulous of the maxillary arch and partially edentulous in the mandibular arch with only few teeth present are 32, 33 and 43 and 44.In the extraoral examination, no abnormalities detected. The diagnostic impressions were made using irreversible hydrocolloid (DPI, Imprint) and diagnostic casts were poured in type III dental stone and were mounted with a tentative jaw relation on mean value articulator to enable planning the final treatment. After evaluation, the treatment planning was explained to the patient. The patient was agreed for the best possible treatment.

Materials and Methods:-
1. Alginate impression materials (DPI, Imprint)
2. Green stick compound
3. Polyvinyl siloxane material
4. Autopolymerizing acrylic resin
5. Hot water
6. Rubber bowl
7. Spatula
8. Modeling wax
9. Teeth set
10. Metal copings

Procedure:-
Initially root canal treatment was done for tooth number 32, 33 and 43 and 44. Decoronation was done in the root canal treated teeth by maintaining 2mm of tooth structure supragingivally. Post space preparation was done with the pilot drill to final drill in recommended sequence for placement of metal coping with post for better retention of the

coping (Figure 3). The copings were fabricated in dome shaped on 32, 33, 43 and 44 using pattern resin (Duralay inlay pattern resin) extra pattern resin was trimmed off (Figure 4). The copings were further evaluated for fit in the patients' mouth and lastly cemented with glass ionomer cement (Figure 5). After cementation of the metal copings, impression was made with the irreversible hydrocolloid materials. Border moulding was done with low fusing impression compound and final impression was made with light bodied polyvinyl siloxane for the mandibular arch (Figure 6). Final cast was poured using type 3 dental stone. Denture base was fabricated with the autopolymerizing acrylic resin in the mandibular cast. Then occlusal rims were adapted over the denture base according to proper height and width.

Orientation jaw relation was recoded using Hanau Spring Bow- Face bow (Figure 7)and transferred to the semiadjustable articulator. Mounting completed (Figure 8). Gothic arch intra oral tracing was done for evaluating centric relation. Inter occlusal records in centric and protrusion was made using polyvinyl siloxane (Jet bite fast).

Teeth were selected on the basis of size, SPA concept and shade. Teeth arrangement was done. After trial denture, necessary correction was done on the patient's mouth (Figure 10).De-articulation of the cast from the articular done.

Then wax up and carving done. Investing and then dewaxing was done (Figure 11). Packing was done and acrylization completed. Once the finishing and polishing was done (Figure 12), the prosthesis was inserted into the patient's mouth (Figure 13).

Instructions were given to the patient about method of removal and insertion of the denture and also advised to maintain a good oral hygiene by proper cleaning of the prosthesis after every meal.

Follow-up of the patient was done after 24 hours and no redness, pain or irritation in the soft tissue noticed.

Discussion:-

One of the most important oral health indicators is the ability to retain more number of teeth throughout life. Edentulism or complete tooth loss is prevalent worldwide among older people. Earlier studies have shown that edentulism affects the health and the overall quality of life of the elderly[8]. Overdenture is a favored treatment modality for elderly patients with few remaining teeth. In overdenture treatment, the teeth are included as part of the residual ridge which provides proprioception and comfort for the patient[6]. Advantages of overdentures include preservation of alveolar ridge, increased denture retention, stability and proprioception. Disadvantages include the obligation of increased oral hygiene maintenance to prevent caries and periodontitis. The overdenture tends to be over contoured in the position of natural teeth, more chances of fracture if insufficient acrylic thickness and appropriate amount of tooth reduction is not done. Encroachment of inter-arch space is another limitation[7].

Alveolar bone resorption is considered as an oral disease and undergoes throughout the life in edentulous patients. However complete edentulism affect the quality of life and evade a social stigma[9]. With the advancements like dental implants, implant supported prostheses is being used for treating patients but anatomical, medical and financial constraints often prevent patients from opting for the best possible treatment. Implant prostheses do not have as much occlusal awareness as teeth[10]. Implant cannot compensate the loss of periodontal sensory mechanisms that guide and monitor gnathodynamic functions. Overdentures require accurate assessment of vertical interarch space. There must be sufficient interarch space, together with an adequate thickness of denture base material and artificial teeth, without jeopardizing the strength of the denture[11].

Miller[12] in his study concluded that alveolar bone resorption depends upon three variables like: the character of the bone, the health of the individual, the amount of trauma to which the structures undergo. Overdenture helps in reducing shrinkage of surrounding bone by decreasing the pressure on the alveolar ridge. Rissin et al. in 1978 compared masticatory performance in patients with natural dentition, complete denture and over denture. They found that the overdenture patients had a chewing efficiency one-third higher than the complete denture patients[13]. The success of the tooth-supported overdenture treatment depends upon the proper abutment selection; inter arch space, clinical experience, personal preferences, maintenance problems, cost and most importantly patient's motivation. The attitude of the patient should be entirely assessed prior to the treatment. Only those who understand the limitations and benefits of treatment should be treated with a tooth supported overdentures. Patient selection contributes vastly towards the success of the treatment. Hence, overdentures have been successfully used for

rehabilitation of patients with few remaining teeth as they provide psychological, functional as well as biological advantages to the patients.

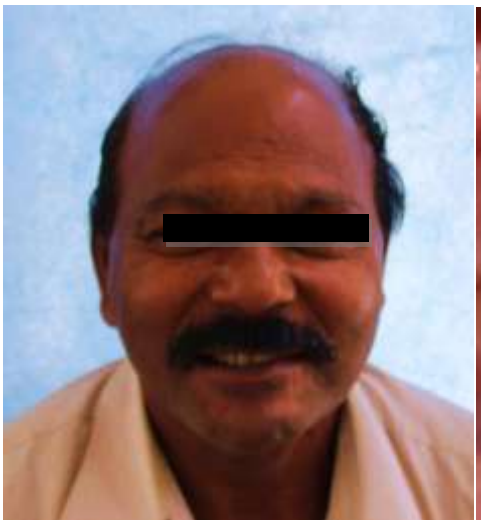

Figure 1:- Pre-op

Figure 2:- Intraoral view.

Figure 3:- Tooth prepared for coping

Figure 4:- Coping fabricated intraorally.

Figure 5:- Coping cemented.

Figure 6:- Border molding and secondary impression.

Figure 7:- Facebow transfer

Figure 8:- Mounting.

Figure 9:- Jaw relation

Figure 10:- Denture try in.

Figure 11:- Processing

Figure 12:- Finished prosthesis.

Figure 13:- Completed prosthesis insitu

Figure 14:- Patient with prosthesis.

Conclusion:-

A tooth supported overdenture is an alternative treatment options to conventional denture when few remaining teeth are present. The maximum number of natural teeth should be retained as much as possible. Rehabilitation of a patient with few natural teeth present using tooth supported overdenture restored the function and evades the social stigma, thereby improves the quality of life of the patient.

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