



Full mouth rehabilitation using monolith zirconia crowns and bridges in bruxism

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ABSTRACT

Complete oral rehabilitation in patient with bruxism is often challenging as a result of loss of tooth structure and loss of occlusal vertical dimension[1]. This case describes a 50 year old man with a history of bruxism and pain on left side of face, occlusal vertical loss and compromised aesthetics and functions. A multidisciplinary approach was applied using monolith crowns with root canal treatment of all the remaining natural teeth. An occlusion mouth guard was given to protect the restoration. After 14 months of function no major complications were registered. The restoration in bruxism cases requires proper planning and multidisciplinary approach in order to

ensure the proper prognosis and success of treatment. Monolith zirconia crowns appear to be a reliable treatment with satisfactory clinical result and minimal technical problems.[3]

I. CASE REPORT

A 50 year old man reported to clinic, New Delhi with severely worn dentition. The main complaints were related to impaired masticatory function, left muscular pain, tooth sensitivity and aesthetics. Also patient had history of taking antidepressants and was hypertensive. fig 1 a-c



fig 1 a front view



fig 1 b right view



fig 1 c left view

Intraoral examination revealed several absence of teeth, worn of maxillary and mandibular teeth, All remaining teeth show dental craters and sharp edges on enamel which indicates active

wear. On extraoral examination, Patient was having bilateral hypertrophy of masseter muscle and increase in muscle mass volume. fig 2a-b



fig 2 a intraoral maxillary view fig 2 b intraoral mandibular view fig 2 c intraoral front view

Radiographic examination revealed absence of teeth no.12,25,26,31,37,46.rct of 13 was already done before.Fig 3



figure 3 radiographic view before treatment

The patient was diagnosed as partial edentulism and bruxism.A comprehensive assessment and diagnostic evaluation were taken before any procedure. occlusal evaluation shows the patient did not display a mutually protected occlusion. The anterior maxillary teeth displayed severely worn palatal .The anterior mandibular teeth displayed worn surfaces.Both posterior maxillary and mandibular teeth displayed worn occlusal surfaces.The magnitude of occlusion vertical dimension loss was measured using the intraocclusal rest space with the jaws in rest position was found to be around 8mm(normal 2 to 4 mm).Extraoraland intraoral photos were taken and cast poured. The smile design and wax -up ,the

treatment plan was presented to the patient. As their was need to increase the vertical dimension to obtained all the spaces.The treatment options were obtained and patient opted for the conservative treatment plan which included root canal treatment of the remaining teeth and monolith crown and bridges. All other options were discussed with the patient along with their advantages and disadvantages.A definitive treatment plan using monolith zirconia crowns and bridges along with the root canal treatment was opted by the patient for proper function and aesthetics.A written informed consent was taken after facial and smile analysis.The photos were taken and intraoral impressions were made using addition



silicone(coltene).The diagnostic wax-up was produced on study cast with detailed indication on smile design. All changes were made needed on the mock -up before the final rehabilitation of the patient. Meanwhile,endodontic treatment was done for the remaining teeth for future need as they were severely worned. Single sitting rcts were done.

After endodontic treatment,the teeth for both the arches were prepared in a single day using gingival cord. After preparation of the teeth, impressions were made with addition silicone(coltene) to obtain definitive casts. Maxillomandibular (facebow)records were made and the master cast was mounted on semiadjustable articulator.



fig 4b: final try in mounted on semiadjustable articulator

Crowns and bridges were cemented using non-eugenol temporary dental cement.as this point the provisional were made with an increase of 4mm of vertical dimension. Following this new impressions were made and temporary crowns were made for the patient and given to patient for 4weeks. After 4 weeks,no muscle tenderness and temperomandibular discomfort was observed the initial diagnostic wax up was then duplicated to form a new fixed monolith crowns and bridges .Digital technologies were included in the workflow with laboratory scanning of the master cast and CAD/CAM manufacturing software along with computer controlled machinery.The cast and

wax up were scanned in the computer aided design software to design to generate prototypes to be used as definitive guide for zirconia restorations.The crowns and bridges were made according to the wax -up and were inserted intraorally to evaluate the occlusal vertical dimension,asthetics,phonetics,occlusion and patient satisfaction. The prototypes were then scanned and merged with the master cast following intraoral adjustments. The monolith zirconia frameworks were milled using CAD/CAM software according to manufacturer specifications. The fit of the monolith zirconia was checked intraorally and minor occlusal adjustment were adjusted.fig 5 a-b



Fig5a final monolith crown and bridge front view fig 5 b side view of monolith crowns and bridge

Thus, monolith zirconia crowns and bridges were inserted and cemented with resin modified glass ionomer cement and excess cement was removed. As with the previous occlusion, the patient was provided with mutually protected occlusion, minor occlusal adjustments were made

intraorally with diamond bur and polished with zirconia polishing burs. Also canine guidance and anterior guidance were also verified for eccentric jaw movements with posterior jaw disclusion. fig6 a-b



fig6:a) Canine guidance on right side verified for eccentric jaw movement



fig6 b):canine guidance left verified for eccentric jaw movement

The final restoration was found have good aesthetic and functional value. The patient was advised on the importance of regular follow up for 6 months and proper brushing and flossing techniques were demonstrated.After14 months, no complications were found except minor adjustments were made.fig 7



fig 7 final view after 14 months

II. DISCUSSION

Dental wear is a physiological process that occurs constantly throughout life.the loss of tooth structure is a multifactorial and progressive process and can be exacerbated by extrinsic and intrinsic process.it can be related by eating and parafunction habits, stress, systemic process and occlusal pattern. Tooth wear can be identified as attrition, erosion and abrasion occlusion tooth wear is mostly attributed to attrition which is the loss of tooth structure caused by mechanical wear of tooth surfaces. One of the most important and common cause of tooth wear is bruxism.[2]According to the American academy of of sleep medicine, bruxism can be defined as the repetitive muscle activity of

the jaw characterized by clenching/grinding of the teeth.[2] The exact aetiology of bruxism is unknown. The consequences of bruxism include temperomandibular disorders, tooth wear, headaches, Implant and other restorative failures. There is no specific treatment of bruxism. Management of this disorder is directed towards preventive measures that include tooth and restoration protection, reduction of bruxism activity and symptom relief. The prosthodontic rehabilitation of these kinds of patients should be based on the need of the patient and available material.[4] The recently introduced -minimally invasive techniques , composite build up and use of zirconia crowns unlike previously only metals



crowns were used.5 Monolith zirconia crowns may provide a valid treatment modality in the aesthetic zone for aesthetic and proper functioning of occlusion[4]. They provide satisfactory clinical results with minimal biologic and mechanical complications.[3]

III. CONCLUSION

The restoration of worn dentition requires a multidisciplinary approach for the proper function and prognosis success of treatment. The choice of material is also important for the success of treatment. The CAD/CAM high strength monolith zirconia appears to be appears to be q reliable treatment option. Zirconia crowns have high aesthetic and strength and satisfactory clinical results with minimal complications.

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