

“Full Mouth Rehabilitation of a Rheumatoid Arthritis Patient – The Muzyanas Challenge”.

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ABSTRACT

Complex occlusal rehabilitation of a mutilated natural dentition in a patient whose temporomandibular joint is compromised by a systemic condition like rheumatoid arthritis and its drug regimen of immunosuppressant medication, would apprehend many practitioners and dental academicians to treat because of unpredictable prognosis. Pre prosthetic mouth preparation in such cases is unavoidable and requires surgical intervention in the form of pulp extirpation, crown lengthening and extraction of natural teeth. A female patient aged 27 years reported with such challenging medical characteristics. Organized surgical intervention and immune enhancing diet procured maximum benefits during the drug stoppage time. Foundation restorations included multiple cast dowel cores without having any guidance from adjacent teeth regarding their inclination and height. A new method of determining cast dowel height and inclination has been described. Porcelain fused to metal crowns and fixed partial denture completed rehabilitation with a mutually protected occlusion. The patient was highly satisfied with her redeemed appearance.

Keywords: Rheumatoid disorders, immunosuppressant, methotrexate, cast dowel core.

INTRODUCTION

Rheumatoid arthritis (RA), a chronic multisystem autoimmune inflammatory disorder, is one of the forms of multivariable rheumatoid disorders with reduced life expectancy that can lead to pain, disability, deformity, functiolesia and concomitant psycho social effects. The disease usually starts between the third and fourth decade of life,^[1] affects predominantly females (3:1) of generative age (35-55 years),^[2] affecting primarily synovial joints in a symmetry [Temporomandibular joint (TMJ) occasionally may be indicative as first symptom] with periods of exaggeration and remission. The disease has no specific biological characteristic (except positive rheumatoid factor in the blood serum in certain cases),^[2] and has a wide range of similar clinical disorders that makes the diagnosis further difficult. Development of polyarthritis in hands and feet are its salient features, while involvement of small joints like

spine and larynx has also been reported.^[2] Deformation/crippling typical of RA, occurs with progression of disease.

TMJ involvement ranges from 50-75 % of early cases, either unilaterally or bilaterally, presenting clinically as swelling, stiffness, pain and tender joint (marked during mastication) which later manifests as crepitation and may impair occlusion (due to loss of condylar height). The relationship between an ideal occlusion and the temporomandibular joint is well documented.^[3] TMJ of patients with active RA condition renders the joint more vulnerable with related effects like less occlusal support, more occlusal interferences, more discrepancy between centric occlusion coinciding with centric relation.^[4,5] The compromised TMJ condition therefore demands that the occlusion should be ideal and healthy; otherwise TMJ deterioration will be prompt. What if there is no/poor/bad/compromised occlusion, in such patients? Should complex Prosthodontic rehabilitation be undertaken in such cases? If yes, what precautions should one take? To answer such unexplored questions, this article presents a case of full mouth rehabilitation in a young female patient with active rheumatoid arthritis on immunosuppressant medication.

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CASE REPORT

A female patient, aged 27 years of local origin, reported to the comprehensive care clinic at college of dentistry, with chief complaints that ranged from failure of enjoying eating food, bad odour and bad teeth. Preliminary screening of the patient revealed that the patient was medically compromised since she was suffering from active rheumatoid arthritis since last 14 months and was under a medication regimen [Methotrexate (2.5mg), Celebrex (100mg), Humira (Adalimumab), Folic acid (Befolvit), Calcium and vitamin D (Centrum)] since last 6 months. Prior RA diagnosis history, the patient reported to have fatigue, xerosis, TMJ pain on the left side that radiated to temporal and frontal region and exaggerated on eccentric mastication and opening wide. Post RA diagnosis and treatment history, the patient reported hair loss, frequent infections and nausea which were associated with her medication. Diet preference included sweets, ready-made food and soft drinks. Psychosocial history discovered infrequent brushing with paste, home occupation in populous environment, separated parents (interracial marriage) and a brother suffering from autism. Extra oral examination disclosed non tender enlarged lymph nodes (infra mandibular), ovoid face, very thick lips, the deviation of the mandible on opening and crepitation in TMJ.

Intra orally, the natural dentition was grossly decayed and mutilated [Figure 1a-d] with loss of facial surfaces (vertical dimensions maintained on one side only), compromised periodontum and occlusion. Conventional Orthopantomograph and intra oral periapical (IOPA) disclosed multiple periapical lesions, root stumps, localized periodontitis and pulpal involvement of most of the natural teeth [Figure 1e-i]. The clinical diagnosis was enhanced by superficial removal of caries [Figure 1j,k], following which a diagnostic mounting was done on a semi adjustable articulator (Whip Mix; Elite Dental Services, Inc, Orlando, Fla) that was programmed using multiple interocclusal records [Figure 1]. CBCT (cone beam computed tomography) radiographs were also done during the course of cementation after patient complained pain in the temporomandibular joint that showed the presence of osteophytes in the vicinity of the right condyle [Figure 2 and 3]. After, thorough investigations that included complete blood count, electrolytes and BUN (blood urea nitrogen), electrocardiogram, X- rays, including chest and cervical spine, pulmonary function test, blood gases and liver function tests, an informed consent of the patient was obtained.

Diagnostic phase was completed by presenting various treatment options to the patient with most desirable option being that of full mouth rehabilitation using fixed and removable partial dentures subjected to approval of pre prosthetic mouth preparation by patients rheumatologist

(extraction of 16, 18, 28, 31, 36, 37, 38, 41, 46, 48, endodontic treatment of 13, 14, 15,16,17, 23, 24, 25, 27 and 46, crown lengthening of maxillary and mandibular anterior segments both labially and lingually, maxillary left and right labio-palatally and mandibular right labially, cast post core for 11, 12, 13, 21, 22, 23, 24, 25 and prefabricated post core in 14, 15). For medico legal purpose, the rheumatologist was presented with a list of dental materials and chemicals that would be either placed inside the patient or used upon her. For all surgical procedures to be completed, a period of ten days was most appropriate while for minor surgical procedures like obturation, another period of ten days was considered appropriate.

Existing drug regimen of rheumatoid therapy, was modified by stopping methotrexate and adalimumab, one and two week respectively before the day of commencement of surgery which was completed in ten days following which both drugs were started again one and two weeks respectively. Surgical phase was completed under antibiotic coverage (Amoxicillin 2 g in divided dose for ten days) and prophylactic antibiotic coverage (2 g orally 1 hour before major surgical procedure). Pre anesthetic assessment included local and systemic response to local anesthetic solution. Ideal sterilization and disinfection protocol was followed during all surgical procedures. A dietary regimen was prescribed for a period of ten days before first day of surgery. For every surgical extraction indicated, pulp extirpation was done in indicated adjacent teeth to minimize anesthetic use. Crown lengthening procedures were done using a combination of manual and electro surgery [Figure 4 a-f].



Figure 1: Diagnostic phase showing existing clinical and radiographic condition

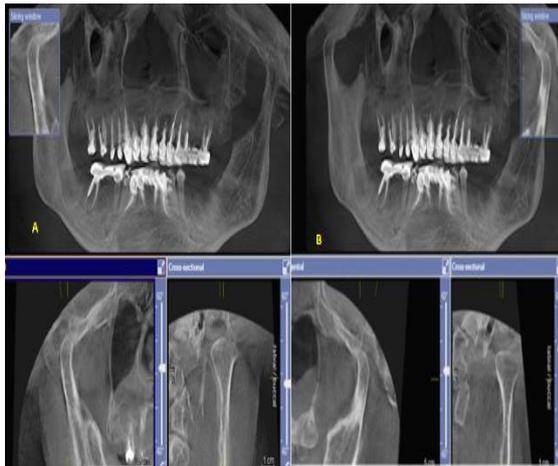


Figure 2: CBCT showing magnified condyles with slight osteophyte present on right side

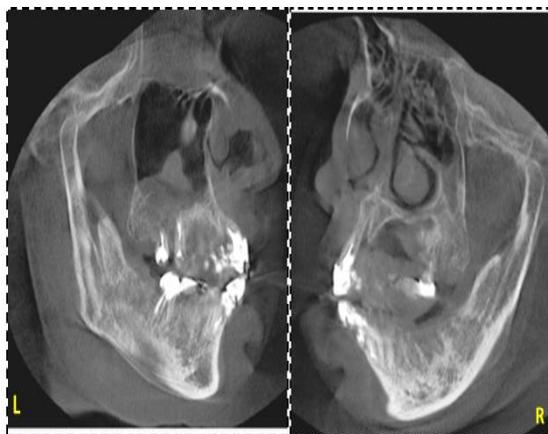


Figure 3: CBCT (lateral view) showing the relation of condyles in the condylar fossa.



Figure 4: Crown lengthening (a) Maxillary anterior (b) Maxillary right labial (c and d) Maxillary right palatal (e) Mandibular anterior (f) Mandibular right molar

After completion of endodontic treatment of indicated teeth [Figure 2], the patient was observed for a period of 4 weeks before prosthetic phase was initiated. Foundation restorations were placed after assessment of surgical and endodontic outcome. As there was no guide to correctly locate the

inclination and length of the cores, the principles of complete denture rehabilitation were applied. An occlusal rim was prepared on a blocked out primary cast which was then verified for vertical relations [Figure 5a]. Artificial teeth were then arranged and trial was done to find the most aesthetic position of the teeth in relation to the patients facial features [Figure 5b,c]. With artificial teeth still within the confines of the occlusal rims, a window was created from canine to canine through which the post space of all anterior teeth was visible [Figure 5d]. Prefabricated fiber posts (Rely X fiber post 3M – ESPE) were used for maxillary premolars [Figure 5d] while all anterior teeth received cast dowel core [Figure 5f – h]. Mandibular anterior and posterior region received a six unit and a three unit fixed partial denture respectively [Figure 5i]. Two endodontic failures in mandibular anterior region had to be accommodated in the treatment plan.

Temporization ranged from polycarbonate crowns (3M-ESPE) to CAD/CAM (CEREC-AC Sirona) fabricated temporary crowns [Figure 6a-h]. Temporary restorations were used to verify the effect of the established new anterior guidance. The temporary crowns were used by the patient for a period of ten weeks. Minor adjustments in occlusion were done over a period of time. Definitive restorations were placed based on the principles of Pankey Mann Schulyer philosophy while following Dawsons quadrant arch approach in which mandibular and maxillary anteriors were restored first at a steeper anterior guidance so as the canines could disclude the posteriors in protrusion [Figure 7a,b].^[6,7] A mutually protected occlusion was provided with stable and coordinated occlusal contacts. All maxillary posteriors received porcelain fused to metal crown with occlusion in metal (buccal facing) [Figure 7c]. Four surveyed crowns were a part of cast partial

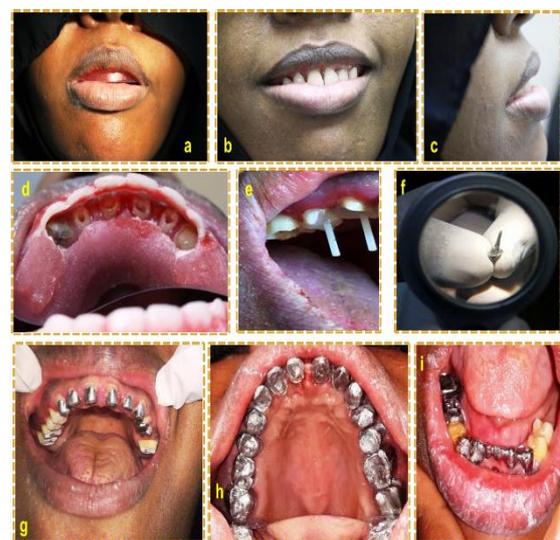


Figure 5: Placement of foundation restorations in the form of prefabricated and custom cast post cores.

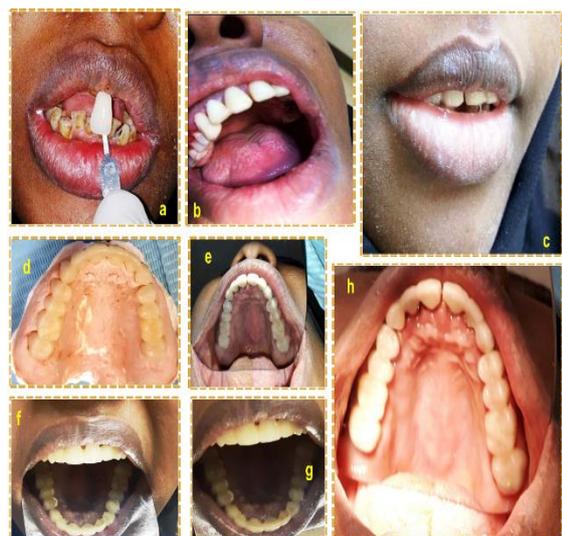


Figure 7: Definitive restorations with porcelain fused to metal individual crowns and cast partial denture.

denture support [Figure 7d,e]. Home care instructions were given to the patient regarding oral hygiene maintenance and patient was put on a two week follow up for three months initially followed by monthly for a period of 18 months. The patient was highly satisfied with her occlusal rehabilitation with improved aesthetics, phonetics and masticatory function [Figure 7f-h].

DISCUSSION

The variation of rheumatic disorders is wide, hallmark of inflammatory arthritis is destruction of synovial joints by damaging both cartilage and bone which progresses to loss of joint function. Various characteristic of this case like female patient, third decade of life, periods of remission and exacerbation, positive rheumatoid factor in serum, affected synovial joint, non-tender lymphadenopathy, morning stiffness of joints, affected TMJ, hyperesthesia during mastication and wide opening and possibly TMJ involvement the first sign of RA further support the previous findings.[2] [3]

The drug regimen that this patient was on is the most commonly used DMARD (disease modified anti rheumatic drug) (upto 80% of patients) [8]. Methotrexate is a folic acid analog that in high doses blocks purine and pyrimidine synthesis, while in low doses it has well proven efficacy and safety while decreasing mortality in patients who have not received the drug. [9] The maximum beneficial dose is 25 mg per week and in case it is not adequate then other drugs are added. In this case, there was a flare up of temporomandibular joint discomfort during final cementation of the anterior crowns which prompted to take a CTBT. However it cannot be concluded that whether the flare up was because of withdrawal of drug for few

weeks or it was due to new crowns although new crowns take some time to produce such discomfort. The purpose of stopping DMARDS (methotrexate) and biologic response modifiers (adalimumab) for specified period before surgery [10] [11] was to observe flare up if any, prevent wound dehiscence and impaired healing due to immunosuppression. However, studies have been conducted where during surgical phase the drugs were not stopped. [10] [11] In this patient there was no post-surgical complication in spite of a large number of surgeries that included extractions, crown lengthening (alveoplasty and alveolectomy) and pulp extirpation. The patient was advised to consume more immune enhancer diet that included honey, milk products, soups, fruits and structured lipids. Preanesthetic assessment to determine disease extension to minimize anesthetic, surgical and post-surgical risks was immaculately done for both the disease and the drugs taken.[12,13]

CONCLUSION

Although rheumatoid arthritis is a disease that can be physically crippling, oral rehabilitation should be attempted under due precautions and properly planned schedule to enhance normal healing. Psychological boost that augments confidence in such patients cannot be estimated by ordinary means.

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