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HEARING LOSS PATIENTS` TREATMENT APPROACHES, MENTAL HEALTH ISSUES, AND SOCIAL ORAL PATHOLOGIES- part 2- treatment plan

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ABSTRACT

Hearing loss (HL) is the third most prevalent chronic health problem among older adults and is quite common in our study group research. Our study wants to illustrate the research on the connection between HL and depression as well as the therapeutic ramifications for diagnosing and treating comorbid like intraoral rehabilitation, HL, and mental disorders also.

Key words: hearing depreciation, depression, treatment, temporomandibular joint (TMJ), Temporo-mandibular disorders (TMDs), aging, intraoral rehabilitation.

Following a thorough clinical analysis of these patient typologies and a thorough paraclinical examination[1-10], the stages of the therapeutic plan are outlined, and subsequently, notable improvements are observed in both the function of the sense of hearing impaired and the stomatognathic system, taking into account the theories of the Costen stomatognathic dysfunctions and the auditory sensitivity level system, which can be improved throught complex oral rehabilitation in a specific percentage of cases[11-14].

TREATMENT PLAN

We strongly recommend this template to be used for writing the article.

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Primary prophylaxis- Health education

Patient awareness of his bad oral hygiene (Figure 22):

• Advice on general oral hygiene: Demonstration of modified bass technique: brushing teeth, suggestion for a toothbrush with medium/soft tufts, use of mouthwash and dental floss.

• Introduction of concept of regular flossing and non-cariogenic diet.

• Patient awareness of the risks of smoking/ alcohol.

Extraction of teeth 4.6, remaining roots of 3.6 and 4.7 (Figure 23).

Explanation of treatment plan and possible future complications: cause, duration, etc. (Figure 24).

Endodontic treatment of 3.2 3.1 4.2 4.3 and removal of old restoration extending from 4.3 to 4.6.

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Establishing steps of treatment: schedule treatment plan.

Secondary prophylaxis/treatment outline (inc. pre-prosthetic)- treatment of diseases and prevent local complications: professional brushing and scaling; treating decays; solving periodontal disease; endodontic treatment unrelated to the abutment; extractions.

Tertiary prophylaxis (inc. pre-prosthetic)- prevent complications (loco-regional and general).

Prevention of further complications due to edentulous status by treatment with prosthetic solution: specificity: *mandibular fixed dentures and mandibular removable partial dentures*.

General health treatment:

• Knowing the general diseases of the patient and the treatment they might be doing meanwhile.

• Explanation of seriousness of health issue and emphasizing on taking his/her necessary medication.

• Explaining a balanced diet (less sugars, more proteins, no smoking, no alcohol, etc.)

• Writing down all the medications that the patient takes on his/her chart.

• Making sure the patient is not taking anti-coagulant medications such as Aspirin, Warfarin, Heparin or having serious hepatic diseases.

Preliminary impression (Figure 25)

Before doing the abutments preparations. Is a negative image of patient's hard and soft tissue of the oral cavity using alginate.

Before doing the abutments preparations. Is a negative image of patient's hard and soft tissue of the oral cavity using alginate.

Abutments preparations

Local anaesthesia was used in preparing crown for insertion of future fixed dentures.

The procedure was sensitive and was done with a lot of care and patience.

Preparation is done in an angulation with the insertion axis of the tooth to facilitate insertion of the future prosthesis (Figure 27).

Dental Impression. WASH TEHNIQUE. Adequate amount of Putty was mixed with the activator. It was inserted homogenously in a previously verified impression tray. The tray was inserted centrally on the patient's mouth. Digital pressure was done until the *high viscosity silicon* was set (Figure 28).

After removing the impression from the oral cavity, we must check the impression to be sure it is done perfectly.

Now we prepare the "Low Viscosity Silicon" and place it on the previously done impression and re-insert it in the oral cavity of the patient (Figure 29).

This WASH technique records the finest details. The bite registration was done with high viscosity silicone. An impression of the patient's occlusion in *centric relation* was made for the technician to have the correct relationship between maxilla and mandible.

Obtained results

An important step for final adaptation of future prosthesis in conjunct prosthesis is metallic structure verification.

Metallic substructure: one "Nickel-Chromium" framework was made in the laboratory; bridge (conjunct prosthesis) from 3.2-4.3.

Extra-oral check on the cast: Verification of metallic substructure (Figure 30), (The metallic framework was cleaned with alcohol before insertion in the oral cavity). The insertion path and height of the metallic framework was checked.

Intra-oral check: adaptation of metallic substructure.

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Metal framework had adequate adaptation and no further modification was necessary. Choosing the colour for ceramic. Using a "*Colour key*" (Figure 31) we chose the colour of the future ceramic layer. All the necessary data, including the colour, area that need more retention on metallic sub-structure etc., was written on a paper to be delivered to the technician.

Final restoration

Extra-oral checking of the final metal-ceramic restoration, fitting the final bridge and checking the occlusion. Making sure that we will have no premature contacts and "free space" for the cement (Figure 32).

Checking premature contact points is done using rotary instrument to remove them and articulation paper (Figure 33).

Cementation of the final restorations registered by doing luting of the prosthetic restoration with temporary cement– Repin and definitive with Fuji-glass ionomer (Figure 34).

Patients' follow-up, the verification and definitive cementation, and patient also received his acrylic mandibular partial removable denture for accomplish the complete mandibular treatment and define a stable occlusion and prevent the dys-homeostatic incidents.

RESULTS AND DISCUSSIONS

Following the complex oral rehabilitation, the treatment being carried out both from the point of view of restoring oral hygiene, the treatment of dental caries, simple or complicated, root caries, endodontic periodontal treatments and the treatment of cl I-IV Kennedy edentulous teeth with strict modifications, to- also considered the treatment of occlusal rebalancing and cranio-mandibular repositioning with the wearing of re-relaxation braces and the related balneal-physiotherapy treatment (Figure 35).

The results at the level of the study group obtained from the evaluation after the application of oral rehabilitation procedures are presented in Table 2. The application of the questionnaire after the treatments performed, proved to be structured in the following way: 4(14.29%)=9; 5(16.85%)=8; 5(16.85%)=7; 6(21.43%)=6; 8(28.57%)=5. There are still average results in terms of restoring the desired parameters like: mental and hearing status and we try testing for a longer period to observe at the 2nd time, results that can change to be able to give plausible references.

The mandible, the ear, and the TMJ share important embryologic and anatomic connections [15]. Despite that, the role of mandibular malposition and TMJ dysfunction is frequently overlooked in the management of otitis media. Relation between various ear conditions and TMJ has been known for a century, with a possible role for orthognathic therapy in ameliorating ear function and dental malocclusion also [16, 17].

Old studies and theories said that recognizes that the loss of molars and premolars produces a distalizing movement of the condyle which causes direct pressure on the Eustachian tube (ET), ear structures and the auriculo-temporal nerve. It shows that a vertical collapse of the occlusion is responsible for triggering TMDs, a statement representing the birth of the Mechanical Displacement Theory. The pathogenetic role of the TMJ function, mandible position, and malocclusion has been hypothesized in this complex scenario [18].

Oral appliance and the orthodontic treatment could be seen as a myo-functional treatment since they permanently change

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the vectorial forces of the medial pterygoid muscles and TMJ ligaments, with possibly more durable effects compared to *Eustachian tube (ET) rehabilitation therapy*, whose ending could be followed by a relapse once the muscular dysfunction re-establishes due to malocclusion [19-21].

TMDs is a physical manifestation of a more extensive systemic problem and are termed as a common condition involved in orofacial pain [22, 23]. It is common in oro-facial pain and can be linked to comorbid conditions like headaches, tinnitus, and HL. Neurological disorders like Parkinson's and Cervical Dystonia may cause TMDs. Undiagnosed disc dislocations, bone loss, trauma, and bruxism can cause neurologic, dystonic, and neuromuscular disorders.

Peng, showed that, patients that were subsequently treated for TMDs, 90.2% of it showed disappearance of or significant improvement in aural fullness, suggesting TMDs as a cause of the aural fullness and physiotherapy which includes heat therapy, acupuncture and massage is effective. To the author's knowledge, there has been a case report showing that ear fullness was successfully managed as a TMD In general, changes in the state of hearing, the slight increase in its quality and implicitly in the quality of life, include the improvement of the state of anxiety [24] or depression that complicates situations by removing it from the socially engaged system [25].

CONCLUSION

The treatment of patients taken in study, who are frequently encountered in our clinic has demonstrated a recovery through complex oral rehabilitation that certainly requires time, dedication, and interest, in favour of the patient to obtain a homeostasis at the level of the stomatogenous system and adjacent to it.

a) BEFORE b) AFTER

Figure 22. Oral Hygiene (Pre-Prosthetic plan treatment).

(a) (b) (c)

Figure 23. Extractions (Pre-Prosthetic reparation plan treatment).

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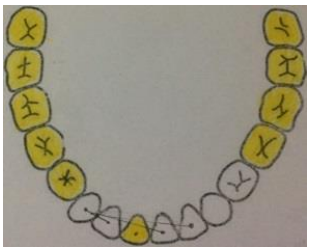
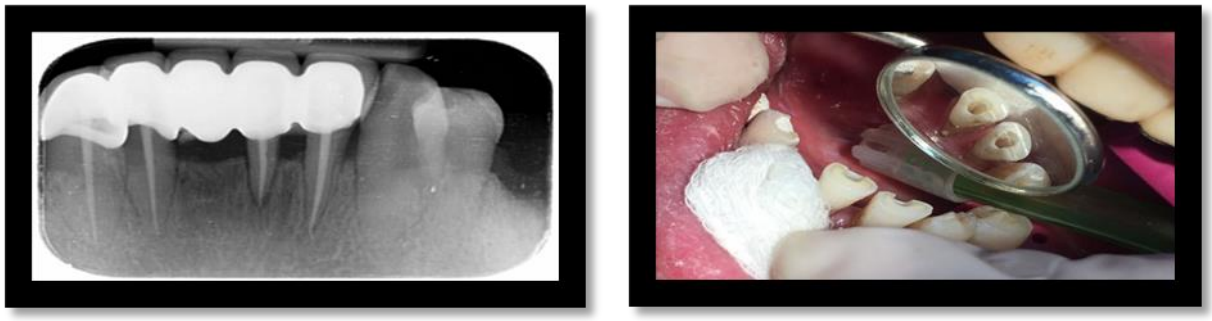


Figure 24. Therapeutic solution indicators at mandibular level sector, Dynamic diagram (social case, regular we must have the informed consent of patient to action at previous treatment); Polynomial law is satisfied for fixed areal future conjunct prosthesis P = 1; R = 3+1+1+1= 6. R > P.

(a) (b)

Figure 25. Preliminary impression.



(a) (b)

Figure 26. Endodontic treatment of 3.1 / 3.2 / 4.2 /4.3.

(a) (b) (c)

Figure 27. Protetic *(Pro-Prosthetic)* aspects from mandibular incisors-abutments preparations.

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(a) (b)

Figure 28. Dental impression partial result preliminary impression and clinical aspects through registration of impression at mandibular arch.

(a) (b)

Figure 29. The mandible-functional impression (WASH technique) and the bite registration results.

(a) (b)

Figure 30. Adaptation of metallic substructure. Intra-oral and extra-oral check.

Figure 31. Colour key-device.

(a) (b) (c) (d)

Figure 32. Extra-oral checking of the final metal-ceramic restoration- multiple view.

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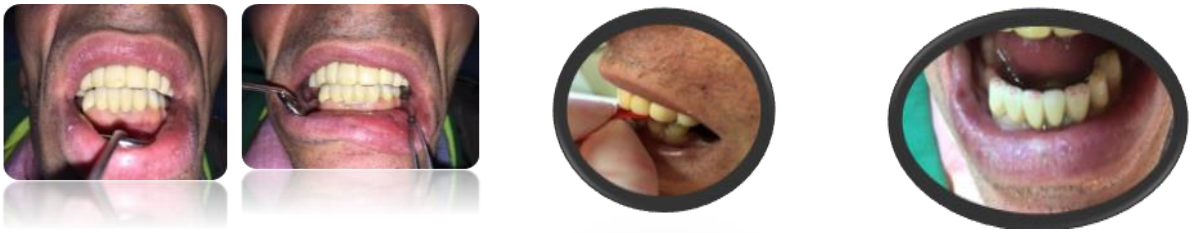
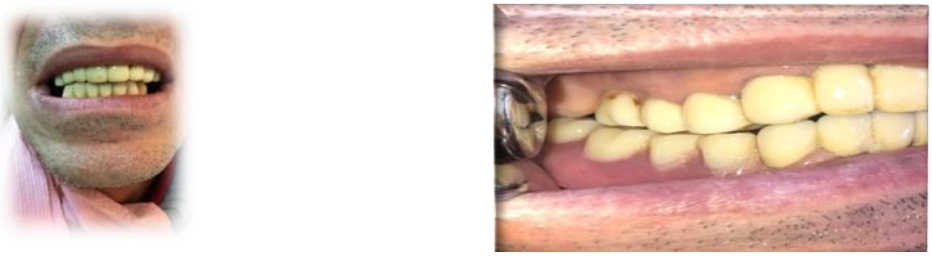


(a) (b) (c) (d)

Figure 33. Intraoral adaptation of final metal-ceramic prosthesis.



(a) (b)

Figure 34. Cementation of the final prosthetic restoration

Table 2. Scoring results of Souleroy scale representation.

Patients number, and (%)	Scoring (Scale 0-10)
4 (14.29%)	9
5 (16.85%)	
5 (16.85%)	8
5 (16.85%)	7
6 (21.43%)	6
8 (28.57%)	5

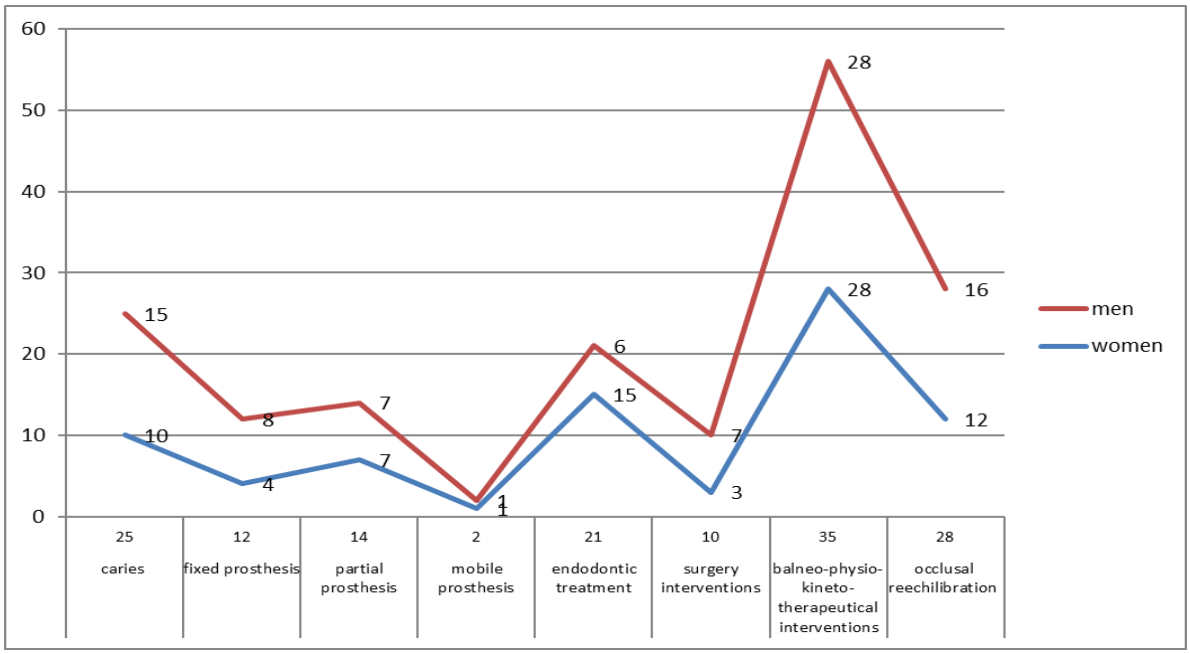


Figure 35. Repartition of intra-oral procedure complex rehabilitation.

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