Egyptian Prosthodontic Association (EPA Newsletter)

Your Simple Guide For The Management of Full Mouth Rehabilitation Cases

Electronic Newsletter

Volume 3. Issue 3

March 2024

Introduction

Full mouth rehabilitation cases have always been a big mystery to the majority of general practitioners, due to their complicated and multifactorial nature in addition to its prolonged treatment duration. The facts that make most of the dentists either refer the cases or get stuck in the middle.[1]

Moreover, the dominance of social media and the influence of Hollywood stars have raised the patients' expectations to the maximum, which led to a shift in the oral rehabilitation paradigms to be esthetically driven in comparison to the conventional techniques, where esthetics were the secondary outcome to biology, structure and function.[2]

These reasons have created an urge to have a simple, scientifically based guide that can be applied to the majority of cases.

However, we strongly recommend the dentists to have and always update the basic scientific knowledge regarding the physiology and biomechanics of the jaws, masticatory muscles and TMJ which are the components of the stomatognathic system and are r primarily affected by full mouth reconstructions.[3]

Sequence of management:

As Dawson previously stated: "if we know where we stand, and where we are going, the journey will be easy". In other words, if we collected enough data and givens for the case, and correctly plan and visualize the final outcome, the treatment sequence will be predictable and easy. This means that we have to start with a thorough and proper diagnosis of the case.[4]

I- DIAGNOSIS:

We probably all know the regular elements of diagnosis including patient's history, extra and intra oral examinations, patient's records, radiographs ...etc

Because of our human nature we may neglect, forget or even miss some details in our diagnosis session. And since the success of rehabilitation cases depends on paying attention to the minor details and recording every single one. J. LEVINE suggested a checklist called "Pre-Esthetic Evaluation Form" (figure 1). This checklist is beneficial in covering all the elements of diagnosis in

1. Effective Questions

:A: If there was anything you could change about your smile, what would it be?

_____

_____

:B: Do you like the visual image of "Straight, White, Perfect", "Clean, Healthy, Natural", or "White and Natural" looking teeth?

_____

_____

:C: History of Esthetic Change

_____

_____

:D: Previous Records – Do you have any photos of your smile, or any smile you like, to aid in aesthetic treatment planning?
o Yes o No

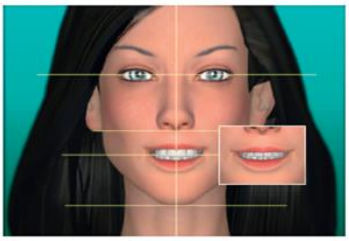
2. Facial Analysis

:A: Full Smile

1. Interpupillary Line to Occlusal Plane
- o Parallel
- o Canted right
- o Canted left

2. Midline Relationship of Teeth (Maxillary) to Face (Philtrum)
- o Coincident
- o Right of center
- o Left of center

3. Relationship of Lips to Face (Lip Symmetry)
- o Symmetrical
- o Left side higher
- o Right side higher



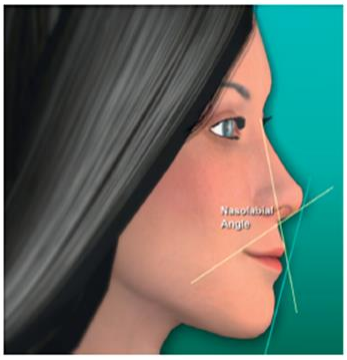
:B: Lips at Rest

1. Upper Lip
- o Full
- o Average
- o Thin

2. Lower Lip
- o Full
- o Average
- o Thin

3. Lips
- o Prominent
- o Retruded

4. Tooth Exposure at Rest:
Maxillary ____ mm
Mandibular ____ mm



:C: Profile View: Facially – Directed Treatment Planning

1. Nasolabial Angle
- o Normal (approx. 90°)
- o Prominent Maxilla (< 90°)
- o Retruded Maxilla (> 90°)

2. Ricketts' E-plane (Drawn from tip of nose to chin)
Upper Lip to E-plane ____ mm (ideally 4 mm)
Lower Lip to E-plane ____ mm (ideally 2 mm)

3. Profile Shape
o WNL o Convex o Concave

If maxilla is prominent, nasolabial angle is < 90°, or profile is convex, consider smaller, less dominant maxillary anterior restorations.

If maxilla is retruded, nasolabial angle is > 90°, or profile is concave, consider more dominant maxillary anterior restorations.

3. Dentofacial Analysis – Vertical and Horizontal Components

:A: Upper Smile Line
o Average o High o Low

:B: Incisal Edges to Lower Lip
o Convex Curve o Straight o Reverse

:C: Tooth – Lower Lip Position
o Touching o Not Touching o Slightly Covered

:D: Full Smile – Number of Teeth Displayed
o 6 o 8 o 10 o 12

:E: Midline Location – Central Incisors to Philtrum
o Center o Right of Center o Left of Center

:F: Midline – Skewing to Left or Right
o Right o Left o Straight

:G: Bilateral Negative Space
o Normal o Increased

:H: Phonetics
1. F Sounds – Incisal edge of maxillary centrals on wet/dry line of lower lip?
o Yes o No
2. S Sounds – Closest speaking space – clear sound?
o Yes o No

4. Dental Analysis

:A: Starting shade
Maxillary ____
Mandibular ____

:B: Central Incisor Width/Height Ratio
o > 80% o < 80%

:C: Proportion of Central/Lateral/Canine
Central Width: ____ mm
Lateral Width: ____ mm
Cuspid Width: ____ mm

:D: Occlusal Analysis

1. Complete Occlusion — Interferences: _____
2. Incisive Position — Interferences: _____
3. Left Working — Interferences: _____ Guiding teeth: _____
4. Right Working — Interferences: _____ Guiding teeth: _____

Figure (1) : Pre-Esthetic Evaluation Form

addition to focusing on the esthetic guidelines and smile design principles to easily correlated to the patient's other records.[2]

II- Patient's Records:

a) photographic records (figure 2A): which became one of the essential elements to have a tentative diagnosis, as it provides an extra confirmation for the clinical examination done and give you a chance to zoom in or out to gather more details that would be helpful for the treatment planning. Three sets of photos are necessary (facial, dento-facial and dental) in three positions (frontal- oblique and profile) and three poses (normal smile- exaggerated smile and repose). A professional DSLR camera is required with a ring or twin flash and a macro lens to give a magnification of 1:1 [5]

b) radiographic records (Figure 2B): that varies from simple intra oral (periapical) to CBCTs. These radiographs are essential to evaluate the bone support, presence of any pathosis, implant planning, teeth restorability ...etc. [6]

c) prelimnary impressions and diagnostic cast analysis: for final evaluation of the teeth, the ridges, visualization of the bite and waxing up of the case.

Not to mention , we have to simulate the mandibular movements (lateral and protrusive) to identify the interferences that need to be adjusted in the waxing up. This means that the casts have to be mounted on at least a semi adjustable articulator (figure 3). To do so correctly, we should use the following:

I- facebow records: to transfer the exact relation between the upper arch and the base of the skull, and the exact inclination of the arch anteroposteriorly and mediolaterally. This can be done either by :[7]

a) maxillary facebow set parallel to the frankfurt horizontal plane (figure 4A),

b) dentofacial analyzer set parallel to the horizon (figure 4B) ,which is better as it's independent from the head's position or the assymetry of both condyles.

We can simply convert the regular facebow into a dentofacial analyzer by using two bubble level scales (one for anteroposterior and the other for medilateral inclinations) as shown in (figure 5)

II- bite registeration: to transfer the exact relation between upper and lower arches.

This can be done usnig regular bite registeration materials (e.g. hard PVS or waxes) to record the teeth in maximum intercuspation (MIP)or deprogram the jaw and muscles to get the centric relation (CR).

Reorganizing the occlusion in the centric relation became popular recently in full mouth rehabilitation cases, as it is a comfortable position for the jaws, muscles and TMJ, it can be easily recognized by the brain leading to a better neuromuscular co-ordintation, and finally it provides a space for anterior restorations without an excessive raise of the occlusal vertical dimension.[8]

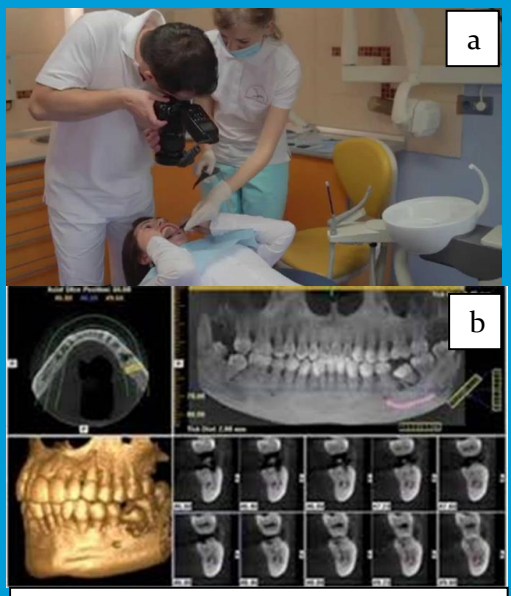


Figure (2) :A) Dental Photography.
B) CBCT

Figure (3): Diagnostic Casts Mounted On Semi Adjustable Articulator

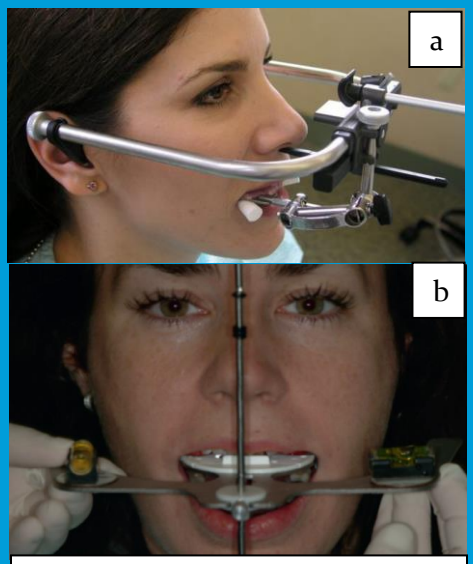


Figure (4): A) Maxillary Facebow.
B) Dento-facial Analyzer

The decision to record the CR or

MIP depends mainly on the health of the muscles and TMJ, stability of the existing occlusion and the need of anterior restorative space as shown in (figure 6)

1- DAWSON bimanual manipulation technique (figure 7A): a very simple method in case of relaxed muscles. But be careful with fingers position on the mandible, direction of the guidnace and the head chair position.

2- anterior deprogrammers (figure 7B): e.g. Lucia jig which act as a quick deprogrammer (maximum 15 mins) for the proprioceptive mechanism leading to relaxing and inactivation of the muscles so the mandible could be easily seatedin the CR. However , it's not beneficial to obtain the initial point of contact (centric slide), can't be used in deep muscle spasms,

3- leaf gauges (figure 7C): similarly to the jig, act as a quick deprogrammer , in addition to easily record the initial point of contact. But caution should be noted that the patient gently touches it, as further squeezing leads to muscular spasms or distalization of the mandible. It's also contraindicated in deep bite, anterior cross bite, mobile teeth, CCP and TMDs.

4- Kois deprogrammer (figure 7D): which serves as long term solution for deep muscular spasms where other methods came shorthanded. With the ability to be worn for an extended period of time (usually two weeks) before the CR recording visit.

Using inlay waxes (analogue) to build up the final design of the restorations (figure 8A), followed by occlusal adjustments and equilibration on the cast to remove the centric (figure 8B), lateral and protrusive interferences.[10]

IV- Fabrication of intra oral Mock up: [11]

By making an index (PVS or clear vaccum formed) over the waxup cast (figure 9) and applying temporary crown material or highly filled flowable composite (injection technique) in the patient's mouth, to visualize the final outcome and get the patient's consent. (figure 10)

It's strongly advised to take an impression for the approved mock-up for cross mounting before the final restorations.

V- MOCKUP driven preparation: [12]

Which is beneficial for a more conservative teeth preparation where the structure remove is just equivalent to the thickness of the final restorations guided by the original waxing up

Many theories regarding preparation sequences including posterior-anterior, anterior-posterior, or segmental (right and left)

The posterior- anterior theory benefits from the concept of providing the best occlusal restorative space guided by the approved anterior guidance (figure 11A). While the anterior-posterior method aims mainly to salvage the approved vertical dimension which may be jeopardized by preparing

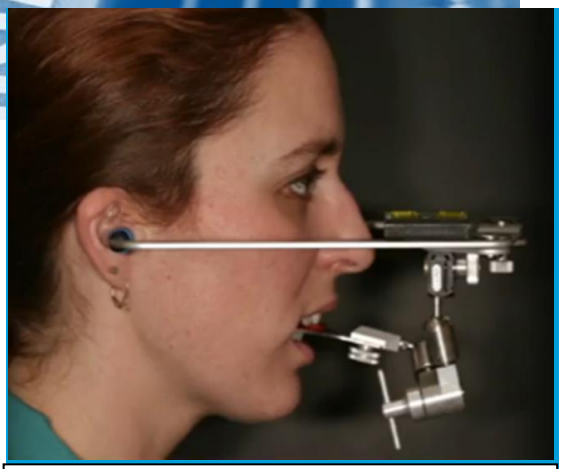


Figure (5) : Maxillary Facebow With Bubble Level Scales

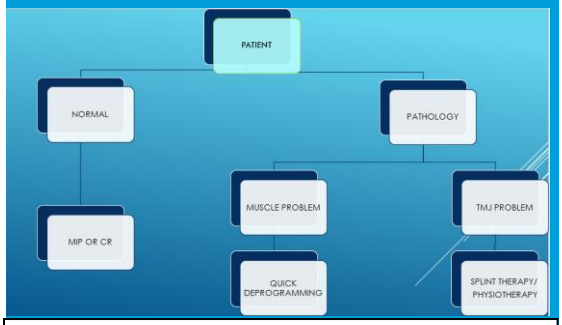
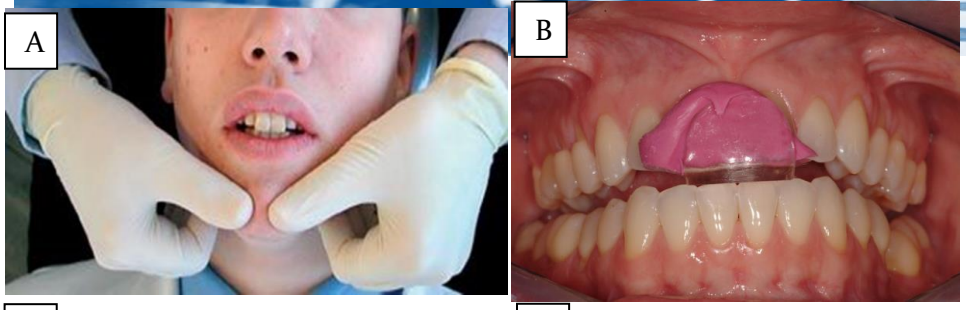


Figure (6) : Decision to Use CR or MIP

Methods to record CR: [9]



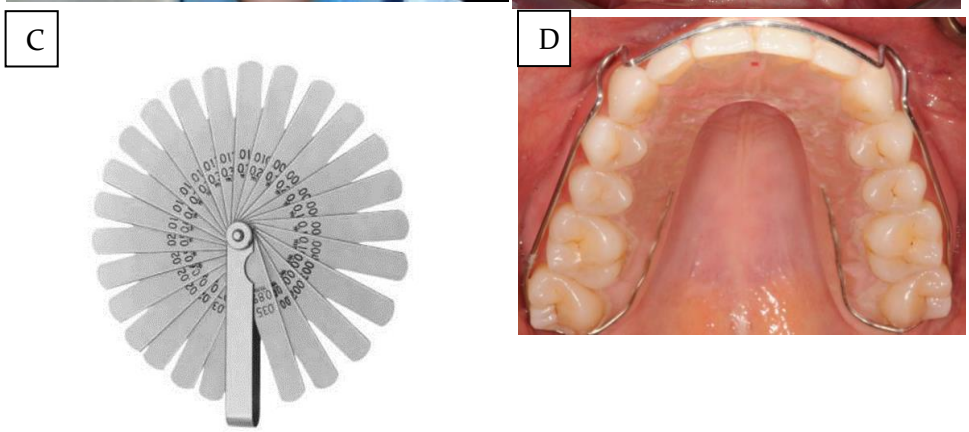
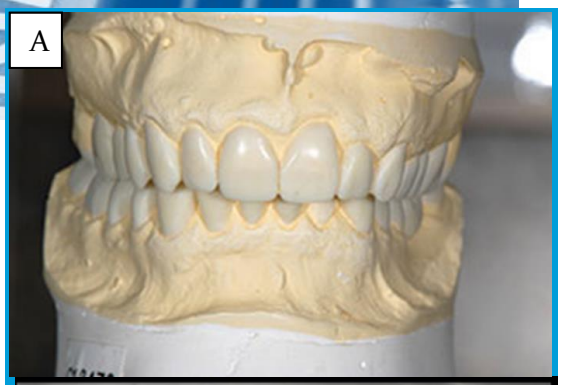


Figure (7) :A) Bimanual manipulation. B) Lucis's Jig. C) Leaf Gauge.

D) Kois Deprogrammer



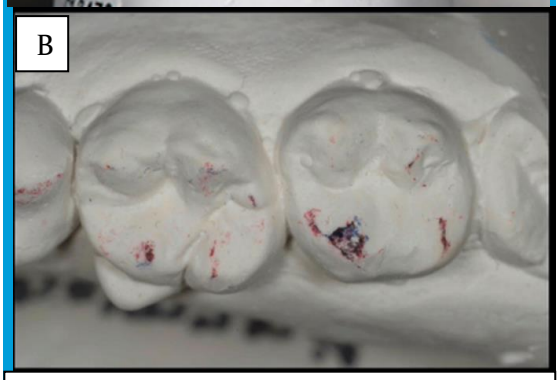


Figure (8) : A) Waxing Up. B) Centric Interference

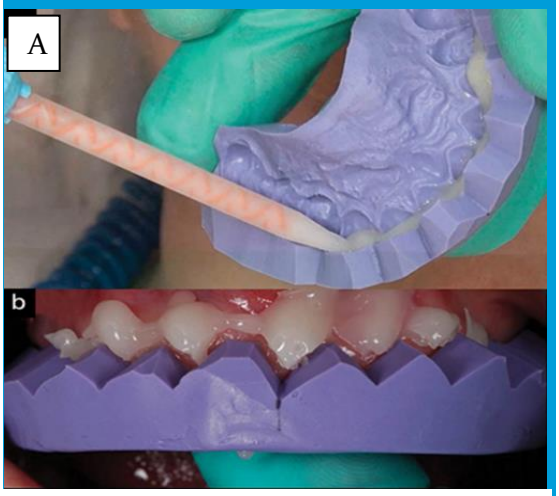


Figure (9) : A) PVS Index. B) Clear Vaccum Formed Index

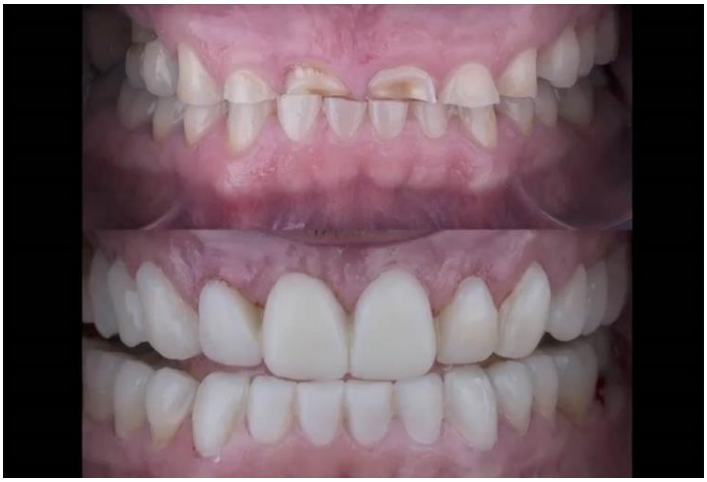


Figure (10): Intra oral Mock-up

the posteriors at first and eliminating the occlusal stoppers.

The segmental theory (figure 11B) actually combines both merits by having stable occlusal toppers on one side and adequate anterior relationship to guide the other side preparations, in addition to time saving having the possibility to preapare both arches in the same session.

A

VI- Fabrication of long-term Prototypes:

Which will be worn by the patient for at least one month to test the new occlusion, and confirm the adaptation of the muscles and TMJ, before taking the final decision for the final restoarations.13

VII- Final restorations:

After confirmation of the stability of the oral structures in the prototypes phase, we can proceed with the final restorations (figure 12), choosing the optimal material (PFM- structural ceramics- zirconia) according the biting forces, patient's expectations and cost effectiveness .14

Figure (11) : A) Posterior-Anterior Preparation. B) Segmental Preparation

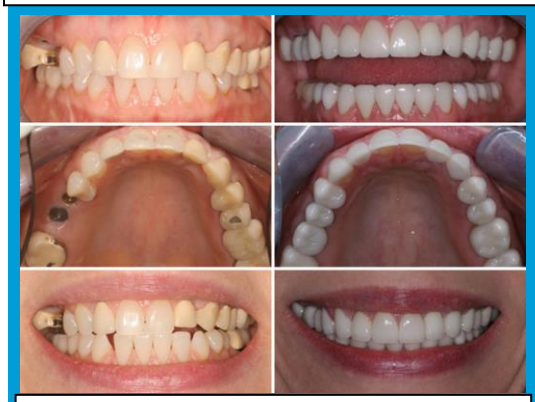


Figure (12) : Final Restorations

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