

## **Oral rehabilitation of a patient with Amelogenesis Imperfecta – A Case Report**

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### **Abstract**

For most patients with a developmental enamel disorders full mouth rehabilitation is one of the most effective option to restore aesthetics and function. This clinical report describes the details of rehabilitation of one such patient with Amelogenesis imperfecta with emphasis on the prosthetics. Treatment involved the use of splint to achieve a musculoskeletal position of the condyle and PFM restorations for all teeth to fulfill occlusion and aesthetics. The outcome was satisfactory to the dentist and the patient.

**Keywords:** Oral rehabilitation, Amelogenesis imperfecta, Acrylic splint, Vertical dimension.

### **1. Introduction**

Occlusal rehabilitation is a treatment option for persons who report with extensive damage to the morphology of several teeth causing them to suffer from inefficient functional occlusion and diminished facial aesthetics. It involves the restoration of a functional harmony amongst the temporomandibular joint, the neuromuscular component and the dental occlusion of the patient. A careful examination and evaluation of the patient's stomatognathic system are to be done and then the objectives are to be decided to achieve the ideals of treatment.

The skeletal components that are altered involve the placement of the condyle in a centric relation position balancing it to an ideal vertical dimension. Centric relation is considered an ideal starting point to achieve functional occlusion when restoring several teeth.[1] A centric occlusion which coincides well with the centric relation is an ideal treatment goal for efficient functioning and stability of the stomatognathic system. Vertical dimension alteration dictated by the functional and aesthetic requirements is well tolerated by a rehabilitation patient. Soft tissue alterations are set to parameters decided upon by a negotiation process between dentist goals and the patient's expectations.

Aesthetic goals involve not only the achievement of pleasing facial aesthetics at a macro level but also the shape, size and color of the teeth at the mini level. Occlusal goals apart from achieving a centric occlusion in accordance with a centric relation will have to establish a dynamic status where

the aspects of a mutually protected occlusion, a canine guided status and ideal incisal guidance is restored. It is mandatory to start with establishing a musculoskeletal position of the condyle in the glenoid fossa before restoring occlusion. [2] A flat plane stabilizing appliance is an adequate adjunct to achieve it.

A minimum period of wear is about 4 to 6 weeks after which the restoration of occlusion process starts. In restoring the occlusion, the posteriors are restored in the beginning. Interim temporary restorations cemented for a period of weeks tell us whether the patient's neuromuscular components have acclimatized to the newly established skeletal and dental alterations. A sound knowledge of the role played by various variables in the clinic and laboratory procedures and skillful accuracy in work are prerequisites when starting occlusal rehabilitation restoration work. Clear communication and understanding between the dentist and the lab technician is a must to achieve the set goals.

To skip a step or to compromise on a certain parameter is a sure recipe for disaster and failure. Treatment objectives listed, treatment plan organized, work done systematically following evidence based scientific data and paying minute attention to all the required details definitely produces desired results and satisfied patients. [3, 4]

This article is a clinical presentation of a patient with Amylogenesis imperfecta requiring extensive dental restorative work. The main clinical problems present in AI

patients are tooth sensitivity, unsatisfactory esthetics, and loss of occlusal vertical dimension due to the rapid wearing of dentition.[1, 2]Hence this patient can be categorized as a rehabilitation patient.

## 2. Case Report

### 2.1 Appointment I

This patient was a dental student who came to the department of Prosthodontics for changing the crowns which he complained did repeatedly fracture under biting forces.

In addition, he was very unhappy with the color and shape of his Maxillary and Mandibular anterior teeth. Extra Oral examination revealed a bilaterally symmetrical skeletal framework with proportionate lower facial height and Class I skeletal relation in the sagittal plane.

Further the lips were competent and neither protrusive nor curled. Morphological length of the lips was within normal range. Intra oral examination revealed stained dentition with enamel chipping and fractured teeth. (Fig 1)



**Figure 1a: Intraoral frontal**



**Figure 1b: Intraoral side view**

Maxillary arch and mandibular arches were ovoid shaped and were symmetrical with the lower midline shifted to the right side by half an incisor width. On a vertical plane the teeth were in deep bite. On a sagittal plane the molars and canines were in Class I relation with the Maxillary and Mandibular incisors retroclined.

Tooth no 15 had a Class I composite restoration. Tooth no 26 had a Metal Ceramic crown. Tooth 36 had a metal ceramic crown. Tooth no 37 had a Class II restoration. Tooth no 46 had an interim Class I restoration. Tooth no 47 had a Class I amalgam restoration. Gross intrinsic discoloration, with very badly worn enamel on several teeth with frequent fracturing of the crowns led to the patient to be diagnosed with ectodermal dysplasia.

Extensive restorative work in the form metal ceramic crowns for all the teeth was the choice of treatment decided upon with the patient's consent. Owing to extensive enamel wear of the posterior teeth and frequent fracture of the restorative crowns it was decided to restore vertical dimension with an acrylic splint to be worn for a period of four weeks to acclimatize the patient to the increased vertical dimension. [5, 6]

### 2.2 Appointment II

A set of good alginate impressions were taken and a face bow transfer was done. The mandibular was articulated using a centric relation record. (Fig 2)With the working casts articulated the vertical dimension was increased by 6mm inter incisally by raising the incisal pin. In this position a mandibular removable acrylic splint was fabricated.



**Figure 2: Articulation**

The splint covered the occlusal surfaces of the mandibular posterior teeth bilaterally with imprints of the occlusal surfaces of the Maxillary teeth enabling the patient to bite in the newly established occlusion. (Figure 3)



**Figure 3: Acrylic splint**

### 2.3 Appointment III

After a period of four weeks of splint wear with the patient experiencing no discomfort the patient was scheduled for restorative procedures.

#### 2.4 Appointment IV

The posterior teeth in the articulated working casts were waxed up to the increased vertical dimension bilaterally. (Figure 4)

Sectional impressions of waxed up models were taken for fabrication of temporary crowns. Posterior teeth of the maxillary and mandibular arches were prepared on the same day and interim acrylic restorations were cemented with IRM.



Figure 4: Wax up

#### 2.5 Appointment V

Once the metal ceramic crowns were ready they were cemented with Glass ionomer cement.(Figure 5)The factors considered while restoring anterior teeth in both the arches was not only aesthetics but also a proper incisal guidance so as to have a functional dynamic occlusion which in the long run serves to maintain the good health of the stomatognathic system.

Overjet and overbite were established to ideal levels altering the inclination of the palatally inclined maxillary and mandibular anteriors. [7] The mandibular anterior teeth were prepared before the Maxillary anterior teeth and temporaries cemented. Metal trial for the all the teeth were done and then the final restorations cemented in place. (Figure 6a, b)



Fig 5: Cemented PFM Restorations



Fig 6a: Mandibular anteriors preparation



Figure 6b: Cemented PFM restorations

#### 2.6 Appointment VI

The Maxillary teeth were the last that were prepared and the final restorations with proper inclination and emergence profile were cemented. Shade and size of teeth were decided not only to establish the required overbite and overjet but also to satisfy the aesthetic requirements of the patient. (Figure 7) and (Figure 8a, b)



Figure 7: Metal Try in



Figure 8a: PFM cemented



Figure 8b: PFM Cemented

### 3. Discussion

Teeth wear due to defective enamel can affect the inter digitation of teeth in all three dimensions the transverse, vertical and sagittal planes. Restorations for multiple teeth in such patients should aim to distribute occlusal forces with equal intensity on all teeth. Failure to do so does result in frequent fracture of restorations such as porcelain crowns. [8]

Centric relation establishment should be the first and foremost requirement in fabrication of restorations for oral rehabilitations patients. Once established properly designed teeth preparation, properly finished teeth preparation, meticulous adhesive technique are other factors important to achieve long term success. In addition, correct lateral and protrusive guidance and lingual contours of anterior teeth in harmony with the envelope of function are vital factors for long term stability of occlusion. [9, 10]

Thus modus operandi of the restorative treatment has to be meticulously planned and executed to have a functional dynamic occlusion and outstanding aesthetics.

Such accurately designed restorations function in harmony with the joints and neuromuscular components. In treating AI with restorative procedures though several methods have been reported [3,4-7] metal ceramic restorations as the treatment modality was chosen for this patient in accordance with literature [3,4-6] due to the extensive damage of the teeth. Technological advances in the field of dentin bonding have resulted in restoration to acceptable level [5].

### 4. Conclusion

Hypo plastic form of AI is characterized by thin enamel with yellowish-brown color, rough or smooth and glossy, square-shaped crown, lack of contact between adjacent teeth, flat occlusal surfaces of the posterior teeth due to attrition, and with/without grooves and/pitting. Occlusal stability is compromised owing to frequent loss of tooth substance. Oral rehabilitation for such patients involves extensive restorative procedures that prevent progression of AI and tackle the psychosocial factor associated with such conditions.

### References

- [1] Seow WK. Clinical diagnosis and management strategies of amelogenesis imperfect variants. *Pediatric Dentistry*. 1993; 15(6):384–393.
- [2] Coffield KD, Phillips C, Brady M, Roberts MW, Strauss RP, Wright JT. The psychosocial impact of developmental dental defects in people with hereditary amelogenesis imperfecta. *Journal of the American Dental Association* 2005; 136(5):620–630.
- [3] Ozturk N, Sari Z, Ozturk B. An interdisciplinary approach for restoring function and esthetics in a patient with amelogenesis imperfecta and malocclusion: a clinical report. *Journal of Prosthetic Dentistry* 2004; 92(2):112–115.
- [4] Gokce K, Canpolat C, Ozel E. Restoring function and esthetics in a patient with Amelogenesis imperfecta: A case report. *Journal of Contemporary Dental Practice* 2007; 8(4):95–101.
- [5] Siadat H, Alikhasi M, Mirfazaelian A. Rehabilitation of a patient with amelogenesis imperfecta using all-ceramic crowns: a clinical report. *Journal of Prosthetic Dentistry* 2007; 98(2):85–88.
- [6] Sadighpour L, Geramipanah F, Nikzad S. Fixed rehabilitation of an ACP PDI Class III patient with amelogenesis imperfecta. *Journal of Prosthodontics* 2009; 18(1):64–70.
- [7] Yamaguti PM, Acevedo AC, De Paula LM. Rehabilitation of an adolescent with autosomal dominant amelogenesis imperfecta: case report. *Operative Dentistry* 2006; 31(2):266–272.
- [8] Kostoulas I, Kourtis S, Andritsakis D, Doukoudakis A. Functional and esthetic rehabilitation in amelogenesis imperfecta with all-ceramic restorations: a case report. *Quintessence International* 2005; 36(5):329–338.
- [9] Dawson PE. Centric relation. Its effect on occluso-muscle harmony. *Dental Clinics of North America*.1979; 23(2):169–180.
- [10] Bowley JF, Stockstill JW, Attanasio R. A preliminary diagnostic and treatment protocol. *Dental Clinics of North America* 1992; 36(3):551–568.