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### Rehabilitation of congenitally missing teeth with precision attachment and fixed PFM bridge: Case reports

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#### Abstract

The definition of hypodontia is obvious and unambiguous: “one or additional congenitally absent teeth” it’s a genetic disease that denotes a stronger clinical expression of hypodontia, includes a wide and non-specific. To define oligodontia. The “absence of the many teeth, sometimes related to little size of the prevailing teeth and alternative anomalies”. The prevalence of genetic disease has been reported as zero.3%. It affects females the maximum amount as males, with a gender quantitative relation of 3:2.3. Genes accountable for non syndromic genetic disease area unit found to be MSX1 and PAX9 genes. Within the current edition of the glossary of dentistry Terms, the definition reads “the formation of less than full complete teeth. Several such teeth area unit smaller than normal”. Current article describe a case of genetic disease treated with jaw unilateral exactitude attachment on distal side of 11 and bar & clip maintained overdenture for the second quadrant with a 1 piece forged denture support of anterioposterior-palatal strap and mandibular complete arch rehabilitation with metal ceramic crowns.

**Keywords:** Tooth agenesis, hypodontia, oligodontia, prosthetic rehabilitation, overdenture, precision attachment, DMSL crown, cast partial denture

#### Introduction

Dental development (or odontogenesis) might be a much regulated technique that is driven by a cascade of epithelial– mesenchymal interactions involving the oral ectoderm and neural crest derived ectomesenchyme <sup>[1]</sup>. Human dentition is heterodont and diphyodont. The heterodonty is reflected by four tooth classes: incisors, canines, premolars and molars. Diphyodonty is represented by a pair of generations of sensible teeth throughout a person's life: twenty deciduous (milk, lacteal) teeth and thirty 2 permanent (adult) teeth. A process of dental anomalies of the primary and permanent dentition occur once specific disturbances in one or a great deal of stages of odontogenesis occur throughout human development. Odontogenesis is characterized by several consecutive stages like tooth initiation, growing cyto differentiation, mineralization, and bone reworking (during tooth eruption) <sup>[2]</sup>.

Biological process disturbances of teeth suggests that any abnormality of teeth, where pathology starts in embryonic stage of life, throughout the formation of dentition. Dental anomalies unit are common innate malformations which will occur either as isolated findings or as a region of a syndrome. Process of dental disturbances might even be transmitted, acquired, or disorder. Not all process dental disorders unit are innate. To classify it peculiarly dental disturbance are 5 kinds of tooth defects. Specifically: Size of teeth, type of teeth, Number of teeth, Structure of teeth, Growth of teeth. To stipulate the term tooth organic process suggests that innate absence of tooth which may be either deciduous or permanent <sup>[3]</sup>.

Many terms appear at intervals in the literature to clarify the event of tooth organic process usually, such as: hypodontia, hereditary condition, anodontia, abnormality of teeth, congenitally missing teeth, organic process of teeth. The term hypodontia is used throughout a slim sense once the number of missing teeth is one or some. Anodontia is Associate in nursing extreme case; denoting complete absence of teeth 5.

Hereditary condition is made public as a result of the dearth of a minimum of six definitive teeth, excluding information teeth, succeeding from hypo development of teeth germs.

Hypodontia and hereditary condition unit of measurement another time classified as: one. Isolated nonsyndromic hypodontia, 2. Syndromic hypodontia, 3. Nonsyndromic hereditary condition and 4. Syndromic hereditary condition. MSX1 and PAX9 genes play a key role in early tooth development. PAX9 might be a paired domain transcription factor that plays an essential role in odontogenesis. All mutations of PAX9 noted up to currently are associated with nonsyndromic form of tooth organogenesis [4]. WNT10A gene mutations unit of measurement responsible of body recessive forms. The pathology is isolated, or is said to different embryonic tissue abnormalities and syndromes like embryonic tissue abnormality, anomaly and surface. hereditary condition can occur in association with varied genetic syndromes, like embryonic tissue abnormality, Van Der Woude syndrome, subnormality and Reiger syndrome or as a nonsyndromic isolated familial attribute, or as Associate in Nursing occasional finding.

Causes of teeth absent from birth include: Genetic syndromes, Inherited characteristics not related to a genetic syndrome (non-syndromic), infection throughout physiological state, Metabolic pathology, Exposure to radiation, Tumors (benign and cancerous) [5].

Missing teeth not exclusively have an impression on your look but can impact your ability to chew and your overall oral health. Connected problems to your health usually accompany hereditary condition. These missing teeth can cause the reduced size of your appendage, lowered height of your face, and different issues in tooth development.

Clinical manifestation of this condition is hereditary condition is said to teeth of Associate in Nursing abnormal size (smaller) and kind Oligodontia (conical, taurodontism). Enamel abnormalities and delayed eruption unit of measurement frequent. Hereditary condition is to boot associated with deficient secretion of spit (30% of cases). Different embryonic tissue signs unit of measurement gift in 5 hundredth of patients. One hundred pc of patients even have reduced functioning of their sweat glands and hair or nail abnormalities. Hereditary condition might even be associated with different symptoms poignant embryonic tissue. Structures like skin, nails, hair, sweat glands, spit glands, secretor glands and thus the canal, and it's planning to be clinically associated with embryonic tissue abnormality, a huge cluster of rare diseases.

### Case reports

A 23 years young lady reported to the department of prosthodontics, crown and bridge & implantology at kamineni institute of dental sciences dental college with a chief complaint of a multiple missing teeth and willing for the replacement of those. On clinical examination teeth present are 11, 21, 24, 26, 31, 32, 33, 34, 35, 36, 42, 43, 44, 45, 46, with resorbed residual ridge on maxillary right region and on soft tissue examination reveals generalized gingival inflammation stain+ calculus ++ seen.

Intraoral pre-operative photographs (frontal view, right lateral and left lateral view) (fig. 1) were taken. Patient Underwent diagnostic OPG radiographs. (fig2). Over this diagnostic mounting done on hanau articulator, mockups were prepared using 2GM mockup wax without increasing the vertical dimension. Radiographic investigation clearly illustrated that conventional implants were not possible, due to unavailability

of the required bone, further advised for zygomatic, basal implants, but patient compliance and her health condition with regards to nutritional balance were poor and uncooperative.

Considering the age factor, relevant medical history, and patient poor compliance towards zygomatic/basal implants, radiographic investigation and diagnostic wax up revealed a final treatment plan of ruling out completely fixed prosthesis options and considered semi-fixed prosthesis options with patient consent.

Final treatment Planned is decided as follows:

Maxillary arch: unilateral precision attachment on the free distal end of 11 continued with a bar & clip retained overdenture for the second quadrant pertaining to cast partial denture support with anterioposterior-palatal strap and precision attachment as direct retainer. Mandibular complete arch rehabilitation with Direct Metal Laser Sintered crowns fixed prosthesis.

In Pre- prosthetic phase, ultrasonic scaling was preformed to improve the health of gingiva and postoperative oral prophylaxis was explained to patient for further maintenance. Root canal treatment was performed wrt 11, 21, 24, 26, 31, 32, 33, 36, 42,43 and 46.

In prosthetic phase, tooth preparations were done for all the RCT underwent teeth.(fig 3) Provisional restoration were prepared by using indirect technique with chemically cured composite (dimethacrylate based). After proper finishing and polishing of provisional restorations, They were cemented using template (prime dental template-eugenol free temp) luting cement. This provisional restoration were allowed to remain at place for atleast 2 weeks to develop the scalloped contouring of gingival tissue in accordance with final prosthesis. Patient extreme oral hygiene maintenance was very mandatory at this stage and the same was made aware to the patient.

After two weeks of provisional restorations, it was been observed with a proper gingival contouring in and around the originals. For the final impression making, gingival retraction was done to the prepared teeth using mechanic chemical method with 000 black knitted gingival cord with ferric sulphate chemical using single cord technique. Final impressions were taken with double mix putty wash impression techniques using a spacer width 1.5mm thermoplastic sheet and material addition silicon impression material. (Fig 4, 5)

Metal try in was done to 11 21 24 26 crowns with a unilateral precision attachment as the male component and a bar in between 21 & 24 and 24 & 26 (fig 5 & 6) containing a stud in between which act of precision attachment and female component is present in the cast partial denture having double palatal strap as major connector, mesh type of minor connector having acrylic teeth for replacement of missing teeth. Secondly, try in was carried out for mandibular full arch fixed mouth prosthesis

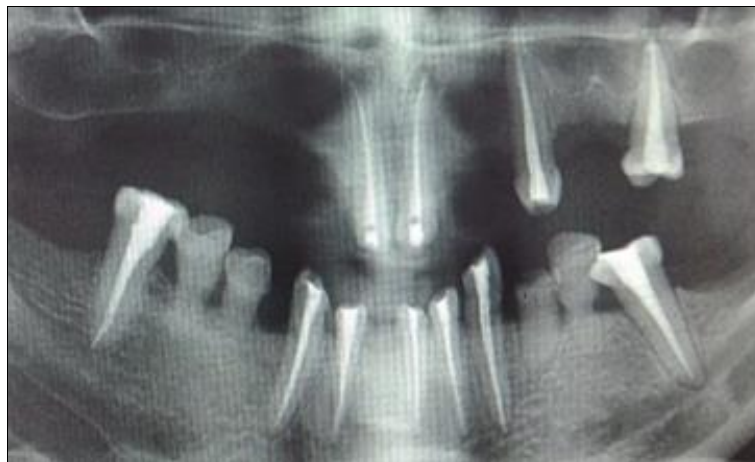
After bisch and final glazing (fig 7), the prosthesis was cemented using glass ionomer cement. Followed with it is a final phase of Cast partial denture try in, including jaw relations and centric Bite registration with wax (fig. 8).Try in was followed with acrylic teeth. (fig.9)Now this denture has clips for bar which is present between 21-24-26, and an attachment for the 11 distal component, all together having female components of unilateral precision & bar attachment. Pre-operative and post-operative photographs were taken. (Fig 10-11 and 12)



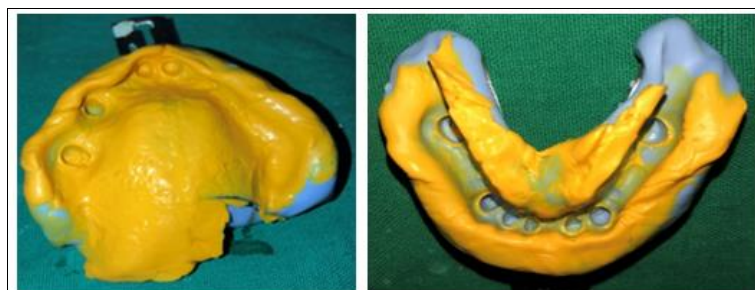
**Fig 1:** Pre-operative



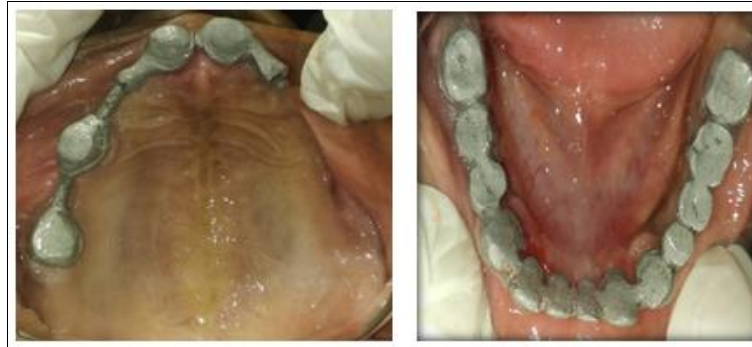
**Fig 2:** OPG



**Fig 3:** OPG after root canal



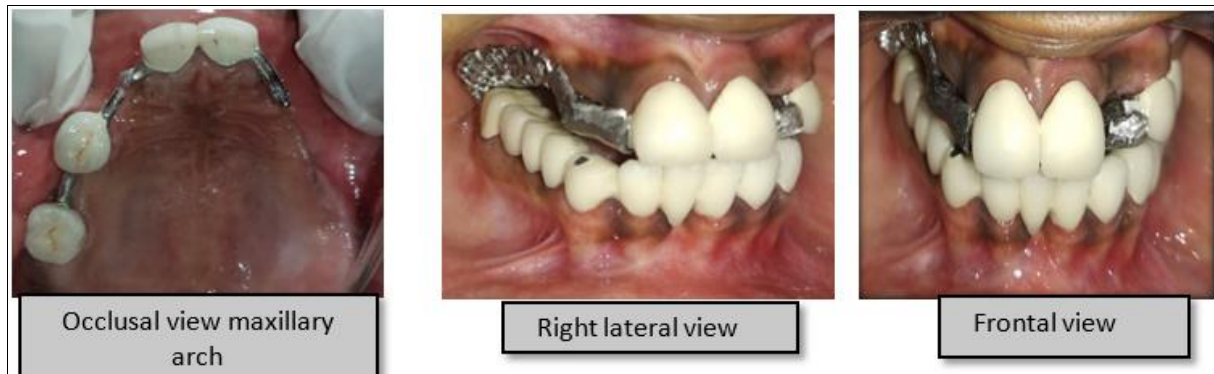
**Fig 4:** Final impression of maxillary arch and mandibular arch



**Fig 5: Metal try-in**



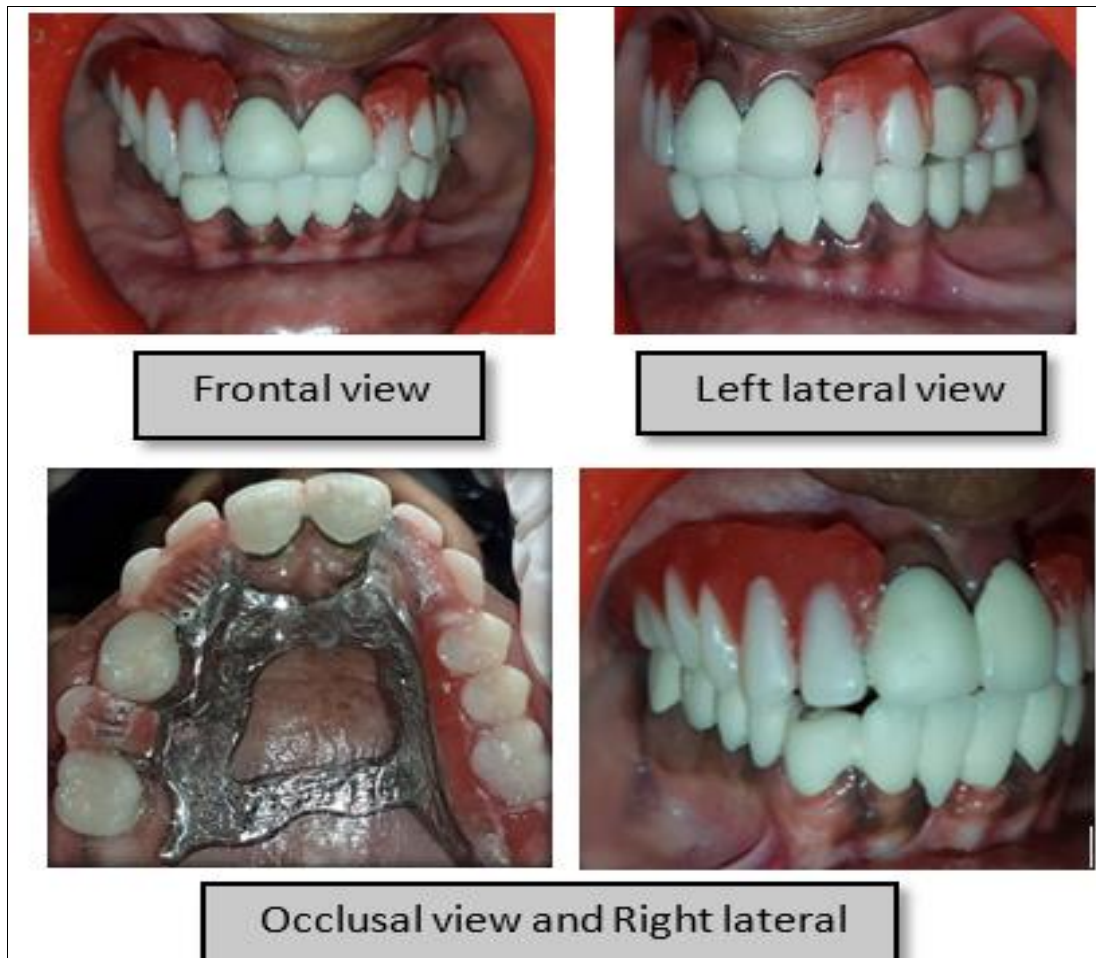
**Fig 6: CPD Metal try-in**



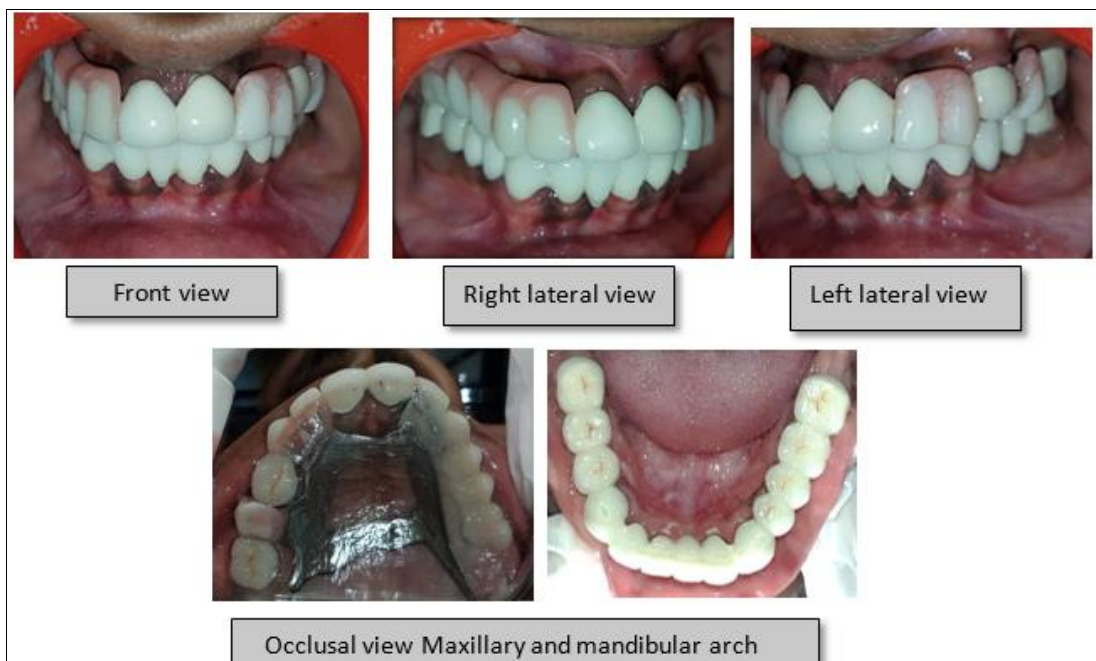
**Fig 7: Bisque try-in**



**Fig 8: Bite registration**



**Fig 9:** Try-in



**Fig 10:** Post-operative view



**Fig 11:** Pre-operative



**Fig 12:** Post-operative

## Discussion

Edentulism might be an enfeebling and an irreversible condition that's portrayed as a result of the 'final marker of health problem burden for oral health. Edentulism can lead on to impairment, helpful limitation, physical, psychological, and social incapacity, and handicap. M M Devan declared, "It is perpetual preservation of what already exists and not the meticulous replacement of what is missing." The thought behind losing teeth is very heavy to the patient [6].

The biological basis for the inborn absence of permanent teeth is partly explained by the failure of the lingual or distal proliferation of the tooth bud cells from the plate. The causes of hypodontia are of measurement attributed to environmental factors like irradiation, tumours, trauma, secretion influences, rubella, and sedative drug or to hereditary genetic dominant factors, or to both. MSX1 and PAX9 genes play a key role in early tooth development. PAX9 might be a paired domain transcription factor that plays a necessary role in odontogenesis. All mutations of PAX9 identified to this point are associated with nonsyndromic tooth agenesis. WNT10A gene mutations are responsible for body recessive kinds of hypodontic germ layer abnormality, odontonycho-dermal and Schöpf-Schulz-Passarge syndromes in addition as of a substantial selection (30 to 5 hundredth cases according to studies) of non-syndromic genetic disorder. Mutations in the gene cryptographically for the AXIN2 molecule, a regulator of the Wnt signalling pathway, are of measurement concerned inside the association between

genetic disorder and a predisposition to bowel cancer. Henking [7] declared that Ledger & Atkinson advocated exploit 'Stumps' beneath artificial dentures for support. Dodge [8] believed that the dentistry sense beneath overdentures helped skillful manipulation of the appliance and preciseness in jaw movements. Overdenture helps to chop back biological process of shut bone and reduces pressure on the appendage. Simply just in case of overdenture corrective, sensitiveness is maintained, there is the presence of directional sensitivity; dimensional discrimination; canine response and tactile sensitivity. The common threshold of sensitivity to a load was found to be 10 times as nice in plate wearers as in edentulous patients. Rissin *et al.* in 1978 compared masticatory performance in patients with natural dentition, complete plate and over plate. They found that the over-denture patients had a mastication efficiency tierce on top of the entire plate patients. A tooth supported Overdenture is improbably exuberant at the forefront as a result of the treatment modality incorporated as Preventive medicine concepts to the core.

## Conclusion

Patient laid low with genetic defect might have severe useful, esthetic and psychological issues particularly throughout the first years of life as rumored within the gift case. A correct and effective management of genetic defect needs the right input. These conditions square measure evaluated fastidiously for the presence of associated symptoms and treated at the earliest with multidisciplinary approach. In current article the case of genetic defect treated with jaw unilateral preciseness attachment on distal facet of eleven and bar & clip maintained overdenture for the second quadrant with a solid plate support of anteroposterior-palatal strap. Articulator-DMLS Full arch. These restorations provides an entire winning rehabilitation of those patients at young age with extra benefits of bigger self-worth, higher social acceptance, restoration of the masticatory perform and aesthetics.

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