

## Case Report

# Complete mouth rehabilitation of sub total congenital anodontia with indigenous implant supported prosthesis

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A 21-years-old female patient with sub total congenital anodontia was referred to Army Dental Centre (R & R) Delhi Cantonment for rehabilitation. The case not having undergone any treatment till date had masticatory, functional and esthetic disability in addition to low self-esteem and self-confidence. Rehabilitation was done with metal cast overdenture in maxilla and indigenous implants/tooth supported fixed partial dentures in mandibular region.

**Key words:** Hybrid prosthesis, implants, occlusion

Partial anodontia is a clinical situation where one or few teeth are missing whereas total anodontia denotes the complete developmental absence of teeth in both primary and secondary dentitions. The term sub total anodontia is used for the conditions where few of permanent teeth erupt and the rest are missing.<sup>[1]</sup>

The causes of anodontia, whether total or partial are attributed to hereditary ectodermal dysplasia, environmental factors, Sotos syndrome, Goltz Gorlin syndrome, etc.

Timely diagnosis and selection of treatment modality with best possible prognosis can save these patients from social embarrassment in day-to-day life along with functional rehabilitation.

### CASE REPORT

A 21-years-old female patient [Figure 1] was referred to Army Dental centre (R & R) from a peripheral dental centre for prosthodontic rehabilitation. The chief complaint of the patient was lack of teeth since childhood, inability to chew food, improper speech, poor facial appearance and low self-esteem.

On clinical examination, the patient was found to be of sound health with above average built. No significant systemic findings were elucidated. Clinical examination revealed deficient maxilla, collapsed vertical bite, retruded chin and deep naso-labial angle bilaterally with accentuated folds. The individual had poor phonetics with escape of air orally during pronunciation of certain words like 'Vee', 'Aff' and 'Ash'. The patient had developed inherent tendency to speak with

minimum mouth opening. Family history revealed that her paternal cousin also had similar disability [Figure 1].

Intra oral examination revealed the presence of few teeth 15, 23, 24, 25, 27, 35, 38, 43, 44, 45 and 48. The existing teeth showed rudimentary anatomy. Majority of the teeth were carious and 38 and 48 were impacted.

Radiological assessment was done using orthopantomogram (OPG) and radiovisiography for specific teeth. Radiological examination revealed carious 24 and 43 with periapical lesions. No signs of formation of teeth buds or previously extracted teeth were seen. 38 and 48 were mesioangular impactions [Figure 2]. Endocrinological assay of hormones were carried out in consultation with the specialist concerned and all parameters were within normal limits.

On the basis of history, clinical, radiological and biochemical evaluations, the case was diagnosed to be a case of subtotal congenital anodontia with associated speech impairment.

Treatment plan was formulated in three phases keeping in mind the disabilities.

#### Phase I

- Extraction of 24, 43, which were having alveolar abscess and impacted 48
- Endodontic treatment of remaining teeth followed by post and core with silver amalgam restorations.

#### Phase II

Evaluation of most favorable site for implant placement with the help of maxillofacial CT and placement of six cylindrical two stage TPS coated indigenous titanium



Figure 1: Patient with congenital sub total anodontia

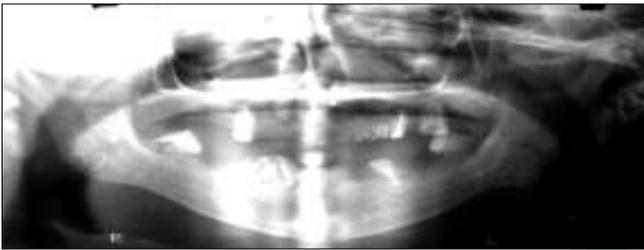


Figure 2: Pre rehabilitation orthopantomograph



Figure 3: Intra oral after phase I

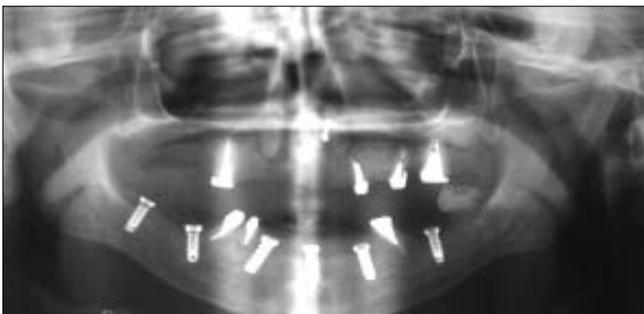


Figure 4: Orthopantomogramme after phase II

implants on selected sites.<sup>[2]</sup>

On clinical and radiological evaluation, it was decided to place implants in the region of 48, 47, 43, 41, 33, 36 in mandibular area and 23 region in maxilla along with osseous bone graft. These implants were placed



Figure 5: Provisional restorations



Figure 6: Provisional restorations

in a phased manner and six months time was given for osteointegration of the implants and the grafts prior to loading [Figure 3].

### Surgical procedure

OPG was done prior to selection and insertion of implants. Appropriate sized implants were selected. Prefabricated template was used and the recommended protocol of implant insertion was followed. Bone graft substitute was placed to augment bony deficiencies. Six implants of varied sizes and dimensions were inserted in the mandible along with healing cap and primary closure was done.<sup>[3]</sup>

### Review

Case was reviewed periodically till 6 months. At the end of sixth month, OPG showed well-integrated implants in mandibular and maxillary bones. Clinically, the individual had maintained oral hygiene meticulously and subsequently had an optimally healed perimplant area. Relocation of the implant was done after six months and gingival formers were placed which were replaced



Figure 7: Patient with provisional prosthesis



Figure 10: Post-rehabilitation

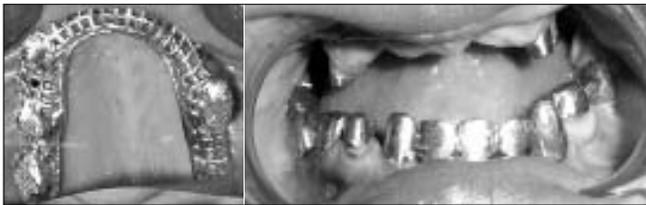


Figure 8: Maxillary cast overdenture and mandibular copings at intra oral trial



Figure 9: Intra oral view after rehabilitation

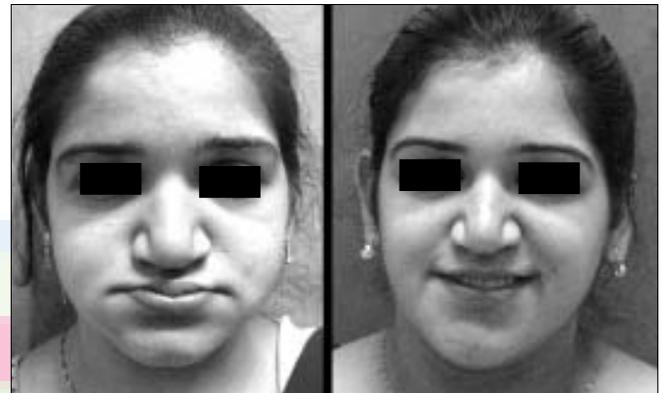


Figure 11: Result at a glance

with abutment after a period of one week [Figure 4].

### Phase III

**Prosthetic rehabilitation:** Intra occlusal clearance was checked and impressions were made in *addition silicone impression material*. Casts were poured with model analogue and abutments. Since the patient was edentulous since childhood, provisional restorations were initially planned so that chewing pattern of the patient could be evaluated for a stable occlusion. Vertical craniomandibular relations of the patient was recorded, maxillary jaw records were transferred to a semi adjustable articulator using face bow. In mandibular region, implant and tooth supported prosthesis were designed in *calodentin polymethylmethacrylate* material.

Provisional mandibular fixed prosthesis were fabricated initially considering 38 as guide for mandibular vertical height. All the provisional

restorations fitted and maxillary overdenture fabricated on the articulated vertical height. Trials were made for overdenture where posterior teeth were arranged in cross bite. Acrylisation was done as routine procedure. Intraoral occlusal balancing was done and the patient were observed for next 3 months for of the provisional restorations of overdenture. Patient was able to masticate properly with minor occlusal adjustment [Figures 5 and 6].

### Rehabilitation protocol

Patient was comfortable with the hybrid prostheses.<sup>[4]</sup> She was able to masticate properly along with improved phonetics and facial appearance. This may be because patient was edentulous and did not have the memory for chewing with teeth [Figure 7].

All prostheses were removed and impressions were made in addition silicone impression material and casts were poured. Upper over denture was designed in cast metal. Mandibular fixed partial denture copings were casted in metal, finish line checked [Figure 8] and jaw relations recorded using addition silicon putty material. Face bow transfer was done on semi adjustable articulator. Mandibular copings were fused with

porcelain. Once cemented, jaw relations were again recorded. Trial was made for over denture along with lower fixed partial denture [Figure 9]. Occlusion checked. Recommended lab procedure was followed and the overdenture was fitted with edge to edge occlusion in anterior region and cross bite in posterior region to support the oro-facial musculature which remained unsupported since last 21 years [Figure 10].

## RESULTS

Patient achieved excellent facial proportions with naso labial folds disappeared. gross labial fullness increase in, Collumella increased appear normal, labio mental fold decreased, overall vertical height optimum lip line, restored smile Improved phonetics.

Improved self esteem and self confidence, which was highly essential because the patient was attending regular professional studies [Figure 11].

## DISCUSSION

Anodontia denotes the complete developmental absence of teeth in either or both dentitions. The case being discussed is somewhere in between total and partial anodontia and hence conveniently called as sub total anodontia. Because partial anodontia denotes the term where one or few teeth are missing.<sup>[1,5]</sup> This rare congenital anomaly is due to gene mutation in X chromosomes, sex-linked and either partially recessive or an incomplete dominant. It appears in females when one X chromosome is affected.

In total anodontia of both dentitions, there is complete aplasia of the dental lamina. In cases where deciduous dentition is present or partially so, the dental lamina has developed and given off the enamel organ for deciduous dentition but further development has been arrested. As buds for permanent tooth germs of the first molars appears at 17 weeks of intrauterine life and rest of the teeth buds start appearing 24 weeks onwards, it depends at what stage there is an arrest of laminar growth leading to total or subtotal anodontia.<sup>[5]</sup>

'Whatever is left should be preserved' is our motto. That is the reason why all rudimentary teeth were preserved by endodontic approach followed by post and core in 14, 23, 25 and 27. Preparation was done for over denture. This treatment helped not only in retention of over denture but also preserved the proprioceptors in their natural condition. In such cases, where the maxilla is short and occlusal forces have to be dissipated all over the alveolar area, proprioceptors will be of great help in selecting the chewing load and avoid overloading of the area.

In the region of mesio-angular impacted 48 was

surgically removed. 43, 44 and 35, which were carious were endodontically treated followed by post and core. Preparations were made to provide initially over denture but later decided to place six TPS coated two stage indigenous implants which were placed at 31, 33, 37, 43, 46 and 48 locations. After 6 months radiographic evaluation was made and it was found that implants were well osseo integrated except slight change in direction of implant at 43 site.<sup>[6]</sup> Implants were relocated by radiographic assessment and surgical procedure. Gingival formers were placed for one week duration.<sup>[3]</sup>

Implant supported hybrid prosthesis over metal framework has been advocated where the main chewing components were designed cantilever and in these cases functional longevity of the prosthesis was compromised. Cement retained overdentures prosthesis has common problems to maintain the hygiene hence well-fitted removable overdenture is the prosthesis of choice. Similarly screw retained prosthesis require frequent visit to the dentist in case of slightest problems.<sup>[4]</sup>

Indetitanium implants were selected for the rehabilitation because they were well-trialed, indigenous and cost effective. The bone density and width were in favor of these implants and the location selected was to distribute the masticatory load evenly by implant/tooth supported prosthesis.<sup>[3,6]</sup>

Hybrid prosthesis have an edge over implant supported fixed partial denture due to proprioception, which come to the rescue the excessive masticatory forces by deflecting the occlusal load. Hence the maximum possible tooth material was preserved in order to harness available proprioception. Hybrid prosthesis is also planned in cases where excessive vertical dimension is to be restored, for esthetic, function, lip support and phonetic restoration. These prosthesis restore gingival colour and contour to give more natural appearance.<sup>[2,4]</sup>

Provisional prosthesis helped in ascertaining the chewing pattern of the patient to stimulate the stomatognathic system and to activate the neuromuscular mechanism. Afferent stimuli from the periodontal membrane, from receptors within the capsule of mandibular joint and from the muscle themselves through mesencephalic nucleus and impulses transmitted from the trigeminal nucleus provide the jaw reflex control of the jaw movements.<sup>[7]</sup> The gains of provisional prosthesis were incorporated in final prosthesis, which the not only restored masticatory and functional efficiency but also improved dentofacial esthetics and phonetics.

## CONCLUSION

Total or subtotal congenital anodontia is very rare especially in females unless one X chromosome is

affected. Immediate treatment modalities include fixed/removable partial dentures or over dentures.

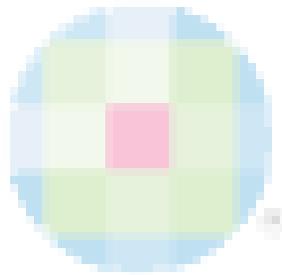
A combination of well executed Implant-supported/tooth-supported, overdenture (hybrid) prosthesis would be an excellent choice in rehabilitation of congenital sub total anodontia in untreated adults in contemporary dental practice.

It is indeed a challenge to achieve optimum masticatory and functional efficiency with esthetic enhancement in cases like untreated subtotal anodontia of adults which is characterized by unguided TMJ movements, improper neuromuscular control and compromised phonetics.

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