



# IMPLANT SUPPORTED PROSTHESIS IN A PATIENT WITH PROGERIA: CASE REPORT

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## ABSTRACT

Prosthodontic rehabilitation can be accomplished with fixed, overdenture, complete, or implant-retained prostheses. Dental treatment overcomes the patient's functional, psychological, esthetic and phonation problems. Remaining healthy teeth may allow the dentist to fabricate a removable partial overdenture, fixed partial prosthesis or implant – supported prosthesis. The retention of a number of abutments helps maintain a positive ridge form with greater height and volume of the alveolar bone, improving masticatory performance, as well as providing a more stable prostheses. Dental patients who have medical problems need many treatment procedures. Multidisciplinary treatment planning is invaluable for patient's dental health. Progeria is a rare genetic condition where symptoms resembling aspects of aging are manifested at an early age. characteristic clinical findings of Progeria disease include abnormalities of the skin and hair in conjunction with characteristic facial features and skeletal abnormalities. The characteristic facies show protruding ears, beaked nose, thin lips with centropalpebral cyanosis, prominent eyes, frontal and parietal bossing with pseudohydrocephaly, midface hypoplasia with micrognathia and large anterior fontanel. The other reported anomalies are dystrophic nails, hypertrophic scars and hypoplastic nipples. The findings that are nearly interested in dentistry are delayed dentition, anodontia, hypodontia, or crowding of teeth. This article presents the multidisciplinary dental treatment planning includes surgical, endodontic and prosthetic treatment of a patient with a history of progeria. In this case complete-arch fixed prostheses in both maxilla and mandible, supported by a combination of implants and teeth are reported.

KEY WORDS: Implant supported fixed partial prosthesis, partial edentulism, progeria, multidisciplinary treatment

## INTRODUCTION

Partial or total edentulism results in some loss of function, such as chewing and effects esthetics. Prosthodontic rehabilitation of a patient can be accomplished with fixed, overdenture, complete, or implant-retained prostheses. For rehabilitation, it is crucial to know the age, number and condition of present teeth. Dental treatment may assist patients in overcoming functional, psychological, esthetic and phonation problems. In patients the remaining healthy teeth may allow the dentist to fabricate removable partial overdenture, fixed partial prosthesis or implant – supported prosthesis (1). Fixed partial prosthesis derives support from the remaining healthy teeth. The retention of a number of abutments helps maintain a positive ridge form with greater height and volume of the alveolar bone, improving masticatory performance, as well as providing a more stable prostheses. The restoration of partially edentulous patients with implant represents a major challenge for the clinician. Sometimes the treatment plan has to be adapted to the patient's demands.

Progeria, a hereditary disease, effects the skin, musculoskeletal system, and vasculature. Progeria shows an accelerated ageing combined with severe growth retardation. As newborns, children with progeria usually appear normal. However, within the first 2 years of life, their growth rate slows and they soon are much shorter and weigh much less than others their age. The disease begins at age 6-12 months, when skin changes and alopecia are first noted and when the infant fails to gain weight. Some children with progeria have undergone coronary artery bypass surgery and/or angioplasty in attempts to ease the life-threatening cardiovascular complications caused by progressive atherosclerosis. However, there currently is no treatment or cure for the underlying condition. The average life expectancy for a patient with progeria is 13 years with an age range of 7-27 years. The mortality of the patient is usually from heart attack or stroke. The prevalence of progeria is reported of 1 in 8 million births. Especially white persons represent 97% of reported patients. The disease has a slight male predilection; the male-to-female ratio is 1.5:1 (2,3,4).

Patient with progeria has the following other suggestive findings which are high-pitched voice, short stature and low weight for height, with prenatal onset of growth failure, incomplete sexual maturation, generalized osteoporosis and pathologic fractures, feeding difficulties and low-frequency conductive hearing loss (5). The characteristic clinical findings of Progeria disease

include abnormalities of the skin and hair in conjunction with characteristic facial features and skeletal abnormalities. The characteristic facies show protruding ears, beaked nose, thin lips with centropalpebral cyanosis, prominent eyes, frontal and parietal bossing with pseudohydrocephaly, midface hypoplasia with micrognathia and large anterior fontanel. The other reported anomalies are dystrophic nails, hypertrophic scars and hypoplastic nipples (6). The findings that are nearly interested in dentistry are delayed dentition, anodontia, hypodontia, or crowding of teeth. A 39-year-old female patient who visited our clinic and diagnosed with progeria was treated by a multi-disciplinary team of surgeons, endodontist, and prosthodontists. A teeth retained fixed partial denture in the maxilla and an implant-teeth supported fixed partial denture in the mandible were planned. This article presents the prosthodontic rehabilitation of the patient with progeria.

## CASE REPORT

A 39 year-old female who was 141 cm tall and 46 kg, presenting with the chief complaint of difficulty masticating due to partial edentulism was referred to the Department of Prosthodontics. Her family has three daughters and the patient was the third child of a couple in their fourth decade of life. The family's medical history contained no report of similar cases except heart disease history. Her sisters were healthy. The patient had familiar heart disease history and had acetilsalicylic acid allergy. In patients's history she underwent aortic valve surgery two times in 1983 and 2007. She needs medication to have menstruation. The patient fell exhaustion and had palpitation without effort. Extraorally short stature, low body weight, prominent eyes, thin lips and micrognathia in maxillary arch, early loss of hair, congenital absence of mammary glands with atrophic condition of the skin and facial features that resemble aged persons were present. Patient also had short clavicles, a horse-riding stance. Particularly all these changes result in a characteristic aged appearance (Figure 1, Figure 2). IQ of the patient was normal. Secondary sexual characteristics fail to develop.

In the patient's dental history it was learned that she had dental malocclusions and had lost her teeth because of periodontal problems. Patient's family had lost their permanent teeth in earlier ages, too. She has no knowledge about the history of anodontia or hypodontia. In clinical examination decreased total facial height, decreased vertical dimension of occlusion and large anterior fon-



FIGURE 1. Facial appearance of the patient.



FIGURE 2. Typical appearance of the patient's fingers.

tanel were observed. The patient's detailed intraoral examination was made. Periodontal condition and soft-tissue examination showed that there were pocket depths over 2 mm and mobility in many of the remaining teeth especially in the mandibular arch. Signed consent form was obtained from the patient for the dental treatment. Her panoramic radiograph was evaluated (Figure 3). Radiographically there were also bone resorptions. The teeth which were contraindicated for the construction of the prosthesis (11, 14, 27, 31, 32, 36, 37, 42, 43, 47, 48) were extracted by a surgeon due to malposition and mobility. Maxillary 12, 21 and 23 were endodontically treated. Maxillary third molar (28) was not included to the prosthesis plan. For the patient, the advantages of retaining the remaining teeth for retention, stability, function and the phonetics of the denture, as well as proprioception, were considered. A diagnostic cast was prepared and the denture was planned. Since the patient's age was young, she did not prefer to have removable partial dentures. So we decided to apply teeth retained fixed prosthesis in the maxilla and implant-teeth supported fixed prosthesis in the mandible.



FIGURE 3. Panoramic radiograph before treatment.



FIGURE 4. Intraoral view after preparation.

Since there were bone defects at the anterior mandibular region, six implants were placed to the suitable areas at the correct positions. Two-stage surgery was applied. Sandblasted acid-etched screw-type four implants were placed (Camlog, Switzerland) on the left side and two implants were placed on the right side of the mandible. Patient's remaining permanent teeth were protected and prepared to perform fixed prosthesis in both maxilla and mandible. In both arches the coronal structures of the existing teeth, axial wall inclinations and relative positions were considered to determine the retention and stability of the dentures. While preparing the teeth the axial walls were made nearly parallel (Figure 4). Impressions were taken with an individual tray using medium-viscosity silicone impression material (Xantropren, M, Bayer Dental, Germany). The restorations were cast with a Cr-Ni based metal alloy (Wirrolloy, BEGO, Germany). Metal fused porcelain was applied as required by the manufacturer's instructions and dental porcelain firings were applied according to the manufacturer's instructions. The metal fused porcelain restorations were cemented to the teeth and abutments using polycarboxylate cement (Harvard CC carboxylate cement, Harvard Dental-GmbH, Berlin, Germany) (Figure 5). Canine protective occlusion was developed. The patient was examined 48 hours later and then followed on a routine control (Figure 6). She had no notable complaints about



FIGURE 5. Intraoral view after prosthetic rehabilitation.

the fixed partial prosthesis. She stated that she was able to speak and function better. Her facial appearance was improved. The patient has been using her prostheses for six months and has not presented any complaints.

## DISCUSSION

Removable partial prosthesis are still extensively used for the restoration of partially edentulous patients. However, these prostheses have been associated with poor patient acceptance, compromised function and esthetics, and increased risk for caries and periodontal disease (1, 7-9). Implant-supported prosthesis offers a predictable treatment for tooth replacement (10-14). The clinical outcome of complete-arch fixed prostheses supported by implants and natural tooth in patients with normal or reduced periodontal support has been reported by few studies, with controversial results (15,16). The range of implant indications has been significantly widened and partially dentate patients represent the majority of patients who need treatment with dental implants today. Implant therapy has become common practice and will probably gain in popularity during the next several years. Implant surgery must be performed to satisfy prosthodontic need and indications. Both surgical and prosthodontic phases of treatment require careful pretreatment diagnosis, evaluation and planning. The individual number and distribution of implants is influenced by following factors; bone quality-quantity, arch size- shape, interarch distance, opposing dentitions, intraoral and extraoral esthetics, need for hygen access and implant inclination. When complete-arch fixed prostheses, supported by a combination of implants and teeth, were fabricated for patients they improve the quality of life for the patient. In patients the remaining teeth for retention, stability, function and the phonetics of the denture, as well



FIGURE 6. Panoramic radiograph after treatment.

as proprioception, were considered. Implant and/or implant-tooth supported fixed partial prosthesis maintain residual alveolar bone, enhance sensory feedback, improve masticatory performance, phonation, and retention and stability of the dentures. Partially edentulous patients especially young patients expect the most esthetic, functional and comfortable rehabilitations. Patients with progeria presents psychological problems related to facial and body appearance. In this case, patient had problems related to early ageing. Since she did not want to remove her prosthesis like old patients, we suggested tooth supported fixed prosthesis in the maxillary arch and implant and tooth supported fixed prosthesis in the mandibular arch. There were enough retentive teeth in the maxilla so it was thought to apply fixed partial denture. Because of the unesthetic results of the clasp arms and the advantages of implant-tooth supported fixed partial prosthesis, she accepted to use implant and tooth supported fixed partial prosthesis. Because of their high esthetic qualities and mechanical stability in the oral environment the metal fused porcelain restorations are used (17). After the insertion of the fixed prosthesis the patient had no notable complaints about her prosthesis. At the six-month follow-up, she stated that she was able to speak and function better. Also her esthetic was improved.

Progeria patients have undergone coronary artery bypass surgery and/or angioplasty. In this case the patient had aortic valve surgery two times in 1983 and 2007. She still has cardiac problems. In this case patient had similar findings such as short stature, low body weight, prominent eyes, thin lips and micrognathia in maxillary arch, early loss of hair, congenital absence of mammary glands with atrophic condition of the skin, facial features etc. Related to the patient's findings we directed the patient to the medical hospital for medical diagnosis to be sure of progeria disease. They wanted a detailed genetic analyses of the patient however the patient's family refused this procedure.

## CONCLUSION

In such cases, removable partial prosthesis and implant supported fixed prosthesis are alternative dental treatments. Implant supported fixed prosthesis were suggested to the patient and she is happy with her dentures.

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