

Case Report

Prosthodontic management of a patient with Gardner's syndrome: A clinical case report

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ABSTRACT

Gardner's syndrome is a genetic condition demonstrating an autosomal dominant trait and characterized by the multiple colonic polyps (familial adenomatous polyposis coli) with sebaceous cysts and jaw osteomas. Various dental abnormalities present in patient's suffering with this syndrome includes multiple impacted or unerupted teeth, supernumerary teeth, hypodontia, compound odontomes and dentigerous cyst. In this case report, a patient with Gardner's syndrome who suffered from functional and psychological problems owing to multiple impacted, unerupted teeth and hypodontia was presented. Patient was treated with a maxillary conventional overdenture opposing mandibular custom bar supported overdentures.

Key Words: Dentigerous cyst, Gardner syndrome, osteoma

INTRODUCTION

Gardner syndrome is a rare genetic disorder characterized by hereditary intestinal polyposis, osteomas, tumors of soft-tissues, cutaneous and subcutaneous cystic lesions and multiple impacted teeth.^[1] This syndrome is named by Eldon J. Gardner who first described the characteristics of syndrome in 1951. It is caused by mutation of adenomatous polyposis coli gene located at chromosome 5q 21, which is the same gene mutant in familial adenomatous polyposis. It has a high dominant penetrance and variable expressivity with incidence between 1:8,000 and 1:1,4000 live births.^[1] The majority of patients have a family history of this syndrome, but 25% can present with a new dominant mutation and be the first member of the family.^[2]

Intestinal polyps are the most important characteristic feature of this syndrome, which are mostly located in

the colon and rectum, but they may develop throughout the gastro intestinal tract, including stomach, duodenum and the terminal ileum.^[3] The polyps start appearing in puberty, but they develop extensively during the second and third decade of life.^[4] Most of the polyps undergo malignant transformation.^[5] The incidence of malignant transformation is about 5% at puberty, which increases to 100% for the patients more than 50 years of age.^[6]

The dental abnormalities are present in about 30% of patients with Gardner syndrome and may include multiple impacted or unerupted teeth, hypodontia, supernumerary teeth, odontomes and dentigerous cyst. The most of erupted teeth have calcified canals. Periodontal space around the teeth is mostly absent. Owing to extremely dense nature of the alveolar bone and the almost complete absence of the periodontal space caused by hypercementosis, tooth extraction in these patients is very difficult.^[7]

Most of the young patients with this syndrome suffer from severe mental distress and psychological problems due to multiple missing teeth resulting in poor esthetics.^[8] Some of the patients disassociate themselves from attending social engagements. Due to hypodontia, masticatory efficiency is decreased;

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patients are not able to chew food properly resulting in digestive problems.

Osteomas of jaw bones, presence of dentigerous cyst, multiple impacted and unerupted teeth, hypodontia, multiple missing teeth in both jaws, offers limited prosthodontic options for successful esthetic and functional rehabilitation of these patients.^[7] Prosthetic rehabilitation with implant-supported and fixed dental prosthesis, most of the times is contraindicated when multiple impacted teeth and cysts are present in the jaw bones.^[3] Saving the few erupted teeth and fabrication of overdenture is a good option for long-term functional restoration of these patients. The presented case report describes prosthodontic management of Gardner syndrome in a young male with mandibular custom bar supported overdenture opposing conventional maxillary overdenture.

CASE REPORT

A 25- year- old male reported to the dental office for prosthetic evaluation. Patient had received a maxillary and mandibular acrylic resin removable partial denture and he had major complaint of difficulty in chewing and wearing the prostheses due to their loose fit and unsatisfactory esthetics. He also had given the history of psychological trauma due to multiple missing teeth and associated poor esthetics. Intraoral examination of patient revealed, multiple missing teeth and broad, well- defined maxillary and mandibular residual ridge. Only remaining teeth were maxillary right first molar, second premolar and left first molar and mandibular central and lateral incisors and right second premolar [Figure 1]. The past dental history of the patient revealed no extraction of any missing tooth.

The dental panoramic tomogram (DPT) revealed multiple unerupted and impacted teeth [Figure 2], well-defined cystic lesion at the left corner of the angle of the mandible, generalized increased density of the mandible, almost complete absence of periodontal space caused by hypercementosis, incomplete root formation of many teeth and radiopaque lesion in left mandibular premolar and molar region. He also gave the history of two painless soft-tissues swellings in the scalp and neck. With a provisional diagnosis of Gardner syndrome in mind, when he was asked directly about his bowel habits, he gave a 2 year history of diarrhea with occasional bleeding. Computed tomography colonoscopy of the patient was performed, which revealed three polyps in the colon measuring

1.5 cm in diameter, which were associated with a high risk of malignant transformation. Colonoscopy and the following histological examination confirmed the presence of colonic adenomatous polyps for which he was advised for colectomy. Moreover, as the cystic lesion at the left corner of the angle of the mandible was completely asymptomatic, he refused its resective surgical treatment.

Due to the presence of multiple impacted teeth, the placement of the implants and fabrication of an implant- supported overdenture was not considered. The fabrication of fixed partial denture and removable cast partial denture was also not considered due to few remaining teeth, unfavorable crown root ratio and large spacing between the remaining teeth. The treatment option presented to the patient was overdentures. On careful clinical assessment of the vertical space (inter arch distance), it was concluded that sufficient vertical space for placement of metal bar, copings, denture base and teeth arrangement was available; so keeping in mind the biomechanical principles of conventional complete dentures, fabrication of a maxillary overdenture and mandibular custom bar supported overdentures was decided.

The root canals and pulp chambers of erupted teeth were calcified, so no intentional root canal treatment of remaining teeth was done. Abutments were prepared with chamfer finish line at paragingival level with a 15° convergence and 1.25 mm incisal and 0.75 mm axial reduction, using diamond points (ISO#223/016 and 223/018, Shofu Dental Corporation, San Marcos, CA). After preparation, suitable size stock trays were selected and impressions were made with putty (Aquasil soft putty/regular set, Dentsply, Mannheim, Germany) and light body (Aquasil LV, Dentsply) of poly vinylsiloxane elastomeric impression material by double step putty wash technique. The impression was poured in the type IV dental stone (Ultra rock, Kala bhai Karson Pvt. Ltd., Mumbai, India) to obtain cast on which pattern of copings and the bar was fabricated with inlay wax (Blue inlay wax, Kemdent, Swindon, United Kingdom). The pattern of copings was dome shaped and that of the bar was rectangular. The pattern was then sprued, invested (Bellalum, Bego, Bremen, Germany), burnout and casted in base metal alloy (BEGOW irocast S, Bego). After retrieving casting from the investment, it was finished and its fit was evaluated on the cast [Figure 3] and in the patient mouth. The copings and bar assembly were cemented on the abutments with glass ionomer

cement (Hy-bond Glass ionomer CX, Shofu Inc., Kyoto, Japan). Complete denture impressions were made after cementation.

Custom acrylic resin tray were fabricated with auto-poly merized acrylic resin (Meliodent, Heraus Kulzer, Newbury, UK) after adapting 1 mm base plate wax spacer on maxillary cast except posterior palatal seal and on mandibular cast except buccal shelf area and retromolar pad. After adjusting custom trays, single step border molding was carried out with medium body poly vinylsiloxane (Reposil, Dentsply) and secondary impression was made with light body (Aquasil LV, Dentsply). Master cast was obtained by pouring the secondary impression in type IV dental stone (Ultrarock, Kalabhai Karson Pvt. Ltd.).

The trial denture bases were fabricated with auto-polymerized acrylic resin (Meliodent, Heraus Kulzer) after applying the separating media over the master cast. Occlusion rims were fabricated over trial denture bases and horizontal and vertical maxillomandibular records were obtained and transferred to a semi-adjustable articulator using a facebow (Whip Mix

Corporation, Fort Collins, Colorado, United States). Artificial teeth were selected and arranged on the record base for a trial denture arrangement and evaluated intraorally for phonetics, esthetics, occlusal vertical dimension and centric relation. After waxup, the denture was processed in heat polymerized acrylic resin (Lucitone 199, Dentsply), finished, polished and inserted. Figures 4 and 5 shows intaglio surfaces of the maxillary and mandibular overdentures while Figure 6 represents intraoral view of overdentures in occlusion. Patient was scheduled for follow-up visits every 3 months and reported no complaints during 1 year of follow-up.

DISCUSSION

Most of the patients suffering from Gardner's syndrome have digestive problems with diarrhea and bleeding.^[2] The condition gets further complicated due to difficulty in chewing and digestion of the food, due to multiple missing teeth, which directly affect their



Figure 1: Intraoral view showing remaining mandibular and maxillary teeth with well-defined ridges



Figure 2: Dental panoramic tomogram showing various well defined dental abnormalities in both jaws



Figure 3: Mandibular custom bar splinting the remaining teeth together



Figure 4: Intaglio surface of mandibular overdenture



Figure 5: Intaglio surface of maxillary overdenture

health and well-being.^[4] The functional rehabilitation by proper prosthodontic management is one of the very important aspect, which allow these patients to continue to live there normal life. Hence, the proper diagnosis and treatment planning for prosthetic rehabilitation is very important.^[5,6]

In this case, the fabrication of implant-supported prosthesis was not considered because of multiple impacted teeth, which preclude the placement of the implants. Keeping in mind, the economic condition of the patient, the crown root ratio and the space between erupted remaining mandibular teeth, a custom bar retained mandibular over denture and maxillary over denture were considered. The bar splints the remaining teeth; minimize the mobility and helps in broad distribution of the forces between the abutments.^[6] It also improves the retention and stability of the denture. The bar should be positioned directly above the crest of the ridge. This position makes it easy to clean the bar and fabricate the prosthesis above the bar.^[7] If the bar is positioned lingual to the crest of the ridge, it will interfere with tongue space and its function and the patient's speech.

The vertical relationship of the bar to the alveolar ridge is very important. When sufficient vertical space is available, providing 2-4 mm or more space between the bar and mucosa will allow easy passage of saliva and food particles as well as oral hygiene aids. Hygiene maintenance in this situation is very easy. Unfortunately, there is seldom adequate space for this arrangement unless across a cleft palate or an area of gross resorption. Hence, in the majority of patients, the bar needs to be placed in even/passive contact with the mucosa. During the fabrication of custom bar retained prosthesis, the



Figure 6: Intraoral view of overdentures in centric occlusion

basic principles of complete denture fabrication must take precedence over mechanical considerations of custom bar.^[7] The main objective must be to gain support from the maximum possible area and reduce to a minimum any displacing loads falling on the denture.

Custom bar significantly improve the level of satisfaction of denture wearing patients by enhancing the retention, support and stability of the prosthesis thereby improving the chewing efficiency and comfort of the patient by reducing the forward sliding of the mandibular denture, maintaining the occlusion and minimizing the trauma of the underlying supporting tissues.^[7,8]

CONCLUSION

Successful functional and esthetic rehabilitation of a young patient with multiple missing teeth, with an oral prosthesis have a great effect on the mental attitude of the patient. A general dental practitioner may be the first health-care professional to review the DPT of a patient with Gardner syndrome. His or her knowledge on the clinical and radiological stigmas of this syndrome may lead to appropriate further investigation and treatment, which might be life saving not only for the patient, but also for their family members. By saving the remaining teeth and fabricating an overdenture significantly improve their functional ability by enhancing the retention, support and stability of the prosthesis thereby improving the chewing efficiency.

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