Full-Arch Implant-Retained Restoration: Fixed or Removable?

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Dental implants as abutments for full-arch restorations are a widely accepted treatment modality. However, when scheduling the use of a fixed or removable implant-supported full-arch restoration, many factors should be considered. Due to the possible need for additional surgical steps to achieve the esthetics surrounding fixed restorations, removable implant-supported dentures, often are a preferable alternative.

The current report presents a comprehensive treatment approach, wherein the patient undergoes different treatment modalities for restoration of the upper and lower full arches at different timelines along with discussing the advantages and disadvantages of each approach.

Although implants have become a widely accepted treatment modality, dentists and patients frequently are conflicted when deciding between a fixed or removable full-arch restoration. Many patients requiring a full-arch rehabilitation, with an esthetically sophisticated and fixed-implant-retained denture (FIRD). In such cases, the esthetic outcomes are often severely restricted by bone loss as a cause of advanced periododontics and/or tooth extractions.

Modern restorative materials and techniques make removable implant-retained dentures (RIRD) to an esthetically and functionally acceptable alternative to FIRDs. A 55-year-old woman was referred for a complex periodontal-implant treatment (Fig. 1, Fig. 2). Due to severe pain teeth #18–16 and 14 were immediately extracted and the socket #14 was augmented using a non-resorbable membrane (Cytoplast, Regenerex GBR-200, Osteogenics Biomedical, Lubbock, TX). The patient was informed about the advanced bone destruction due to periodontitis and the following treatment plan were recommended: 1) extraction of the teeth #13, 12, 22, 24, 14, 16, 36, and 32–42 due to advanced chronic periodontitis as well as caries, and surgical treatment of the rest dentition by access flap surgery; 2) strategic placement of implants to increase the number of abutments; 3) full-arch restoration of the maxilla with a RIRD using telescopic crowns as attachments; 4) implant or teeth retained bridges for restoration of the mandible.

The patient did not accept this proposal and sought treatment from another dentist.

One year later, the patient presented again for consultation. Eleven implants have been placed (Fig.12-15, 24, 25, 36, 45, 46) and the maxilla and mandible have been restored with FPDs at the patient’s request (Fig. 3 – Fig. 5). However, the patient was dissatisfied with the esthetic results due to the unnatural length of the artificial teeth. Furthermore, the design of the existing FPDs impaired oral hygiene.

Due to a home accident, the fractured teeth #23, 25, 45, and 44 were extracted and an implant was immediately placed in region #44. Open tray impressions were taken using a polyester impression material (Impregum Penta Soft, 3M ESPE) and microscope (Carl Zeiss Microsurgical Systems Inc., Pforzheim, Germany). For an ankylosed and/or non-vital abutments were used and temporary covered dentures were fabricated and retained on the provisional abutments (Fig. 6 – Fig. 8).

Two months later, full mouth rehabilitation of the maxilla (supported by six implants) and mandible (supported by six implants) was completed by fabrication of RIRDs using telescopic crowns as attachments, as previously described. Customized abutments served as primary telescopes and electroformed pure gold copings (0.25 mm thickness, AGC Galvanogold, Au>99.9%, Weiland Dental Systems Inc., Pforzheim, Germany) served as secondary telescopes (Fig. 9, Fig. 10). The metal frameworks were milled from titaniu m (Zerodur Ti) Wieland Dental Systems Inc., Pforzheim, Germany (Fig. 11) and veneered using a photo-cured indirect ceramic polymer (Ceramagic, Shofu, Ratingen, Germany) (Fig. 12 – Fig. 15).

Discussion

This report presents a case in which the patient was treated with fixed restorations supported by implants and natural teeth and subsequently treated with an implant-retained removable denture.

The patient initially insisted on fixed restorations. Unfortunately, the dentist fulfilled this wish, despite the existing clinical conditions of loss of hard and soft tissue. Aggressive procedures were performed prior to implant placement, resulting in complications and prosthesis failure. While the fixed restoration resulted in a Functionally satisfactory treatment outcome, the patient was dissatisfied with the esthetic results. The main concern was the unnatural long tooth shape necessary to compensate for the insufficient alveolar ridge height. The esthetic demands of periodontal and/or endodontic reasons that can affect the overdenture support. However, there is no question that the final teeth were not ideal due to additional usage of the telescopic crowns and included esthetic options.

While the fixed restoration resulted in a functionally satisfactory treatment outcome, the patient was dissatisfied with the esthetic results. The main concern was the unnatural long tooth shape necessary to compensate for the insufficient alveolar ridge height. The esthetic demands of periodontal and/or endodontic reasons that can affect the overdenture support. However, there is no question that the final teeth were not ideal due to additional usage of the telescopic crowns and included esthetic options.

There are various reports suggesting soft tissue overgrowth in relation to the telescopic crowns in these situations, hindering the long term oral hygiene regimen associated with these dentures. The complication of fractures related to frameworks veneering or one of the abutments in fixed as well as bar- and-o-crowns supported RIRDs is quite apparent only when treatment is complete. Replacement of the fixed restoration with a removable one led to a more acceptable result. The treatment modality of using telescopic crowns as attachments for natural teeth and dental implants for dentures has been proven successful for many years. This concept not only improves the retention form of the dentures due to frictional forces, but also improves the chewing ability of the patient. Other advantages of using telescopic crowns include feasibility for the patients to remove the dentures for periodic hygiene and maintenance; which is detrimental, particularly from a periodontic perspective.

Various other alternatives to restore edentulous arches include fixed as well as removable prostheses. With regards to the final fixed option, clinicians routinely encounter problems related to the fabrication of prosthesis as well affecting the restorability of the prosthesis at the time of maintenance visits.

Other evident alternatives for RIRDs include fixed or removable full-arch restorations, wish an esthetically sophisticated and fixed-restoration of the upper and lower full arches. This report presents a case in which the patient was treated with fixed restorations supported by implants and natural teeth and subsequently treated with an implant-retained removable denture.

Summary

The treatment plan was completed with the RIRD being a definite alternative to FIRDs. Prosthetics can be used to augment hard and soft tissue. Augmentative possibilities can be used to augment hard and soft tissue. Augmentative procedures related to dental implants for dentures has been proven successful for many years. This concept not only improves the retention form of the dentures due to frictional forces, but also improves the chewing ability of the patient. Other advantages of using telescopic crowns include feasibility for the patients to remove the dentures for periodic hygiene and maintenance; which is detrimental, particularly from a periodontic perspective.

References

New organic toothpaste may inhibit harmful bacteria

By DTI

SEOUL, South Korea: A Seoul dentist has developed an all-natural toothpaste that aims to reduce the health risks posed by Streptococcus gordonii, an oral bacterium that initiates dental plaque formation. Once in the bloodstream, which it may enter through bleeding gingivae, for example, the bacterium also causes blood clots, which can lead to life-threatening conditions such as infective endocarditis, heart attack or stroke.

South Korean dentist Dr Hyung-Ik Moon, head of the Moon Dental Hospital in Seoul, recently obtained the patent for his bacteria-inhibiting organic formula from the Korean Intellectual Property Office. Conventional toothpastes mainly focus on combating two major oral bacteria, Streptococcus mutans and Porphyromonas gingivalis, which are both associated with tooth decay and periodontal disease. However, inspired by a joint study by the Royal College of Surgeons in Ireland and the University of Bristol, which found that S. gordoni can trigger an infection of the inner lining of the heart when entering the bloodstream, Moon started developing a toothpaste that especially inhibits the growth of these bacteria.

“Endocarditis is a serious disease treated only by surgery or strong antibiotics, which is becoming more difficult due to growing antibiotic resistance,” Moon told the Korea Times. “The toothpaste’s anti-inflammatory ingredients include neem and acai berry oil, herbal extracts made from psyllium seed, Japanese star anise, and Japanese cornelian cherry. Unlike most other toothpastes that use artificial chemical preservatives, this toothpaste is only composed of natural, organic compounds, which greatly reduces the risk of side effects,” Moon said.

As the oral mucosa is very susceptible to absorbing harmful substances into the body, it is especially important to use natural ingredients for oral care products, he emphasised. Tested among his patients, the toothpaste’s formula proved to help relieve inflammation, as well as sore gingivae and toothache.

The toothpaste is not available for purchase yet, but Moon is working on releasing it to market soon.

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