Fixed complete prosthesis with no screws and no cement

New restoration concept using LOCATOR F-Tx®
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The fifth German oral health study (Deutsche Mundgesundheitsstudie) showed that the population in many countries is ageing and the desire for better quality of life related to the preservation of teeth and their functionality, among other things is constantly increasing. Periodontal disease is a major cause of tooth loss, as tooth loss results in a decreased ability to maintain physiological masticatory function, as well as a decreased general quality of life. Edentulous people exhibit a lower self-esteem by being excluded from normal masticatory function. The following article describes the fabrication of a fixed superstructure for the edentulous mandible that uses an innovative attachment system.

Dental implants as support for a removable dental prosthesis were introduced many years ago as a treatment option and as an alternative to a conventional complete denture. In the past ten years, considerable efforts have been made to develop new fixed prosthesis without the need for it to be cemented or screw-retained.

Case presentation

The treatment plan consisted of a removable overdenture on four implants in the maxilla and a fixed prosthesis on four implants for the edentulous mandible with the aid of the LOCATOR F-Tx attachment system (Figs. 1–3). This treatment procedure, managed by means of prefabricated system components, will be presented in the following section step by step.

positioning of teeth in the patient’s mouth in order to meet the functional, phonetic and aesthetic demands of the patient (Figs. 6–8). Of course, the focus was also on the spatial orientation of the attachments (LOCATOR F-Tx abutments and denture attachment housings), the prosthetic teeth and the prosthetic restorative material.

Surgical measures

The surgical procedure was performed after clinical and osseous diagnostics and by using surgical templates (Figs. 4 & 5). Both arches were planned with a minimum of four implants in a cross-arch placement and symmetrical distribution which is advantageous in order to guarantee optimised support and load distribution.

Prosthetic measures

Initially, complete prosthetic planning and laboratory procedures to re-establish the proper vertical and occlusal dimensions was completed. This required the housing be placed supra-gingival for maximum adhesion to the prosthesis. Also, the denture attachment housings with the processing balls must be seated on the abutments before the pick-up procedure of the metal framework. The framework should always be designed and milled in such a way that a small (max. 0.2 mm) cement gap exists between the framework and denture attachment housings.

In order to ensure a passive fitting framework, final pick-up of all the denture attachment housings in the framework must be done chairside, all at the same time.
time, and before any further laboratory adjustment steps are performed. The denture attachment housings were aligned as parallel as possible within the aesthetic contour of the prosthesis and block-out spacers were placed on the abutments below the denture attachment housings to block out all undercut. The framework was cemented on using a metal-to-metal cement (Figs. 15–17). The setting time of the cement is ten minutes.

Final adjustments of the framework were performed (Fig. 18). In order to maximise aesthetics, the metal framework was coated with an opaque material (Fig. 19). In the meantime, a panoramic radiograph was taken to confirm that the abutments were seated gap-free on the four implants in the mandible (Fig. 20). In the maxilla, four telescopic self-cleaning (Figs. 22 & 23). A symmetrical implant placement distribution in the mandible and maxilla guaranteed a stable centric relation and articulation with no aesthetic compromise.

Integration
After removal of the process-stabilise the fixed prosthesis (Figs. 27–29).

Anatomically correct final prosthetic designs of the prostheses must be done similar to screw-retained restorations in the edentulous maxilla and mandible. This is most evident from the tool allows easy removal of the prosthesis by leveraging off the retention balls. However, it also must be emphasised that the retention balls are single use only, so new unused retention balls must be used when reseating the prosthesis.

Conclusion
The attachment system presented here is a valuable addition to the prosthetic therapy options for fixed restorative procedures in the edentulous mandible and maxilla. The cost-benefit ratio is also favourable when compared to other options. The principle of a stable occlusion with symmetrical lateral distribution of implants and a limited posterior extension/cantilever ensures the secure retention of the prosthesis and contributes to the optimisation of speech and the recovery of unrestricted masticatory function. If required, alternative measures such as the fabrication of a removable prosthesis are quite possible.

Figs. 21–24: Insertion of the abutments.

Figs. 15 & 16: Placement of block-out spacers at the point of transition between the denture attachment housings and the abutments. Fig. 17: Passive try-in of metal framework without pressure. Fig. 18: Further adjustments of the framework were performed in the laboratory. Fig. 19: For maximum aesthetics, coating the metal framework with an opaque material is recommended. Fig. 20: The panoramic radiograph demonstrated the abutments seated gap-free on the four implants in the mandible. Figs. 21 & 22: Inter-maxillary adjusted occlusion and shaping.

abutments were screwed into the maxillary implants (Fig. 21).

The teeth were attached to the metal framework using denture acrylic. In addition to the aesthetic requirement of the case, it is important to design the shape of the prosthesis’ intaglio surface to be functional, aesthetic and offer better oral hygiene, which allows the patient easy access for fronting balls, the appropriate retention balls were screwed into the denture attachment housings (Fig. 23). It is always advisable to inspect the abutments for a secure fit at the end of all treatment steps (Figs. 24–26). Seating the prosthesis should start in posterior, moving anteriorly, one attachment at a time. This is necessary for the LOCATOR F-Tx attachment system to be effective, as it is the only way to observe the optimal functional, aesthetic and self-cleaning flow, use of a water pick and accurate intraoral cleaning.

In addition, it should be mentioned that the LOCATOR F-Tx prosthesis can easily be removed by the clinician at any time. A user-friendly metal bar and loop.

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The article was published in implants international magazine of oral implantology No. 02/2018