

# RATIONAL OF PREFABRICATED TAPERED CROWN: THE SYNCONE®-ABUTMENT OF THE ANKYLOS®-SYSTEM

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## INTRODUCTION

Telescopic borne superstructures on implants offer improved comfort, remarkable stability and simplified hygiene. However, the manufacturing is very difficult, time-consuming and expensive. This is now extremely simplified using pre-fabricated female and male components.

## THE SYNCONE CONCEPT

The pre-fabricated patrices (fig. 1) can be realized due to a unique property of a conical shaped implant-abutment interface (Ankylos®-system, Dentsply, Friadent, Germany): a free choice of a rotational position of a tilted abutment (fig. 1) combined with the possibility of a firm, anti-rotational fixation. This abutment, at any choice position, can be tightened by a central retaining screw. Therefore, an easy and fast alignment to a common insertion path of different abutments can be achieved although divergent implant axis occurs (fig. 3 a-h). This easy synchronization of several conical retainer abutments was named *SynCone* and enables the use of equal shaped matrices of high noble alloy (fig. 2)



Fig. 1: The prefabricated SynCone patrice  
Fig. 2: The prefabricated SynCone matrices

## Graphical representation

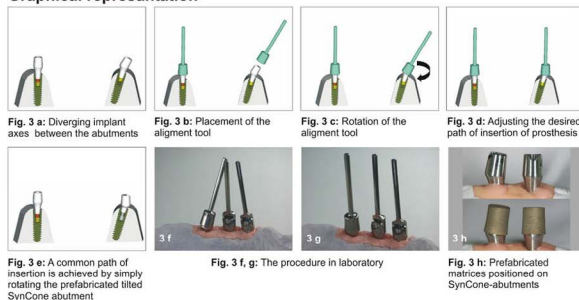


Fig. 3 a: Diverging implant axes between the abutments  
Fig. 3 b: Placement of the alignment tool  
Fig. 3 c: Rotation of the alignment tool  
Fig. 3 d: Adjusting the desired path of insertion of prosthesis  
Fig. 3 e: A common path of insertion is achieved by simply rotating the prefabricated tilted SynCone abutment  
Fig. 3 f, g: The procedure in laboratory  
Fig. 3 h: Prefabricated matrices positioned on SynCone-abutments

## INNOVATIVE PROSTHETIC THERAPY REGIME

An innovative therapy regime was developed to simplify and to accelerate the technical dental and clinical procedures.

At the first session the 3D record of the implants was taken by a reposition of the posts (fig. 4) into a stiff impression material. Additionally the posts serve as retainer of a self curing resin to process a jaw relation record.

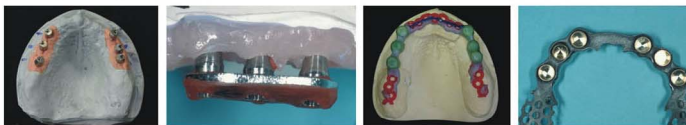


Fig. 4: Reposition posts for the Impression  
Fig. 5: Master cast with gingiva mass and SynCone abutments  
Fig. 6: 'Reposition key' made of pattern resin  
Fig. 7: Tertiary structure prepared for the casting-procedure  
Fig. 8: Desired gap between the cemented surfaces

At the master cast (fig.5) the parallelization of the prefabricated SynCone abutments was "stored" with a reposition-key (fig. 6). Later serves as means transferring the abutment at the same position to the patients jaw. For splinting the matrices an one-unit piece tertiary scaffold was manufactured (fig. 7, 8)



Fig. 9: SynCone-abutments intraoral  
Fig. 10: SynCone-abutments intraoral  
Fig. 11: Matrices placed on the patrices. A gauze protect from saliv.  
Fig. 12: Try-in of the framework. A passive fit is required  
Fig. 13: Intraoral cementation leads to a high fit of the final construction

At the second session all SynCone abutments are mounted with a wrench and the position key (fig. 9, 10). The matrices are placed over the abutments (fig. 11). The tertiary scaffold is then cemented over the matrices in the mouth (fig. 12, 13). This intraoral cementation of the prefabricated matrices to the customized prosthesis scaffold insures an accurate fit.

The use of the tertiary scaffold as the template for determining jaw relations (fig. 14) and as the basis for the impression of mucous membrane areas (fig. 15) covered by the prosthesis reduces the need for corrections of the occlusion and the prosthesis base at the time of prosthesis insertion (fig. 16, 17, 18).



Fig. 14: The gap will be filled on with cement  
Fig. 15: Mucosal impression  
Fig. 16: Final prosthesis: occlusal view  
Fig. 17: Final prosthesis: basal view  
Fig. 18: After the insertion

## PROSPECTIVE CLINICAL STUDY

23 patients (15 female, 8 male, Ø age 58.8 years) were treated with telescopic dentures (11 mandible, 13 maxillae, period of risk Ø = 21.3 months / Min. 10, Max. 29), retained on a total of 104 Ankylos®-SynCone abutments.

One implant was lost in the very early loading period. The rest didn't show any signs of mucositis or peri-implant bone loss. The retention of 21 dentures was sufficient, of two dentures to low (2.2 N) and of one denture to high (23.4 N). All dentures showed a passive fit and a complete lack of micro movements, commented in the patient's questionnaire as stable as fixed restorations. The treatment as well as the laboratory time needed was 49.1 % decreased compared to the conventional manufacturing. The Periotron values give evidence of healthy mucosa (fig. 19) and the Periotest values confirm the osseointegration of implants (fig. 20) during the period of risk.

## STATISTICS

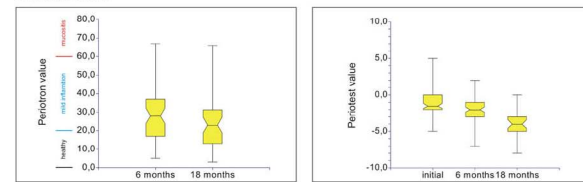


Fig. 19: Measurement of the volume of GCF (gingival cervical fluid) with Periotron 8000  
Fig. 20: Measurement of implant mobility using the Periotest system

## Data interpretation of patient's questionnaire

- ▶ 100% of the patients were highly satisfied with the new prosthesis
- ▶ 90.5% of the patients did not have complications regarding to prosthesis hygiene; the rest of the patients had only initially minor complications
- ▶ No one of the patients had the feeling that the prosthesis shows any rocking
- ▶ 100% of the patients would choose the same art of superstructure, if the had to reach a decision once more

## CONCLUSION

Using the SynCone pre-fabricated conical retainer the clinical degree of difficulty is reduced to the level of a ball-and-socket prosthesis. The patient clearly benefits because the high-precision fit eliminates detectable prosthesis kinetics, so the prosthesis is perceived as a fixed bridge or the patient's own dentition. Therefore, this type of denture achieves a high degree of quality in a simple, reproducible and cost effective manner.