an asian perspective

Patients with thin gingival biotype. Esthetic implant restoration with Ankylos

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INTRODUCTION

The biggest challenge of replacing missing teeth with a dental implant restoration lies in the thin gingival biotype cases. The ability to preserve the bone architecture is paramount to the success of the final outcome and the stability of the soft tissue. The combination of technique and material is essential for the desired result. The protocol and rationale of the technique is outlined in this report.

Today, an esthetic implant restoration is achievable and the result predictable. There are numerous publications that have shown us the necessity of having good bone and soft tissue support. Important parameters have been identified that would affect the long term success of these esthetic restorations. These include the biotypes and architecture of the gingival tissues, the shape of the anterior teeth which also affects the size of the interproximal embrasure which will be filled by the dental papillae.
It has been shown by Olsson et al. that 85 percent of the study population has thick gingival biotypes. The thick gingival biotype is resilient and less prone to gingival recession. Additionally, it is capable of masking the darkening of the soft tissue caused by the titanium abutments. On the other hand, the thin gingival biotype is more transparent and prone to recession, thus necessitating vigorous tissue management. Hence, the gingival biotype clearly affects the final outcome of the restoration especially in the anterior region.

In the Asian population, thin gingival biotype cases are a norm. Compounding this characteristic is the common occurrence of triangular teeth with larger embrasure spaces (Fig. 1). Often,

1_ Thin tissue biotype with highly scalloped architecture accompanied by large embrasure space, a common occurrence in Asian population.
2, 3_ Immediately after surgery and after one year of functional loading. Soft tissue and buccal contours are maintained and an acceptable esthetics are achieved.
4, 5_ Thin gingival biotype cases frequently present with thin buccal plates.
6_ Pre-op condition with retained hopeless deciduous lateral incisors
7_ Standard abutments were utilized immediately after implant insertion.
8_ Immediate provisionalization

we are also challenged with a very thin buccal bone plate in cases with immediate implant placement (Figs. 2 to 5). Additionally, there are many patients in Asia with discoloration of the anterior teeth due to fluorosis. This complicates the replacement of missing teeth even more.

This article presents a clinical case that shows the replacement of teeth in thin gingival biotypes, the protocol and the rationale.

CASE REPORT

A 30 year old female had retained deciduous teeth instead of lateral incisors. They were mobile and discolored (Fig. 6). The gingival tissue was thin. Radiographic finding showed aplasia of the permanent lateral incisors. As the patient also had a high smile line, we planned an extraction of the deciduous lateral incisors with immediate implant placement and provisional restorations.

On the day of the surgery, the deciduous lateral incisors were extracted atraumatically utilizing a periotome. The sockets were inspected for the integrity of the buccal plate. The implant osteotomies were made on the palatal aspect of the extraction sockets with the use of bone spreaders and drills. Two Ankylos implants of 3.5 mm diameter, 11 mm in length, were placed subcrestally with excellent primary stability. The space between the implant body and the buccal plates was filled with xenograft particles. The particles were placed into the space with deliberate pressure. This procedure had to be repeated until the buccal plate was reshaped in order to compensate for the volumetric contraction of the buccal/labial aspect of the site during consolidation and healing of the surgical area.
Standard abutments were placed in the implants (Fig. 7) and more graft particles were placed around the neck of the abutment. Afterwards, provisionals without occlucal contact

were fabricated. When creating the provisional restorations, three features were taken into account (Fig. 8):

- Subgingival undercontouring
- No closure of the interproximal embrasures with an overcontoured proximal surface to allow room for a surgical edema
- Flattening of the labial surface of the provisionals

After 6 to 8 weeks of healing (Figs. 9 and 10), the final impression was made and the final restorations were delivered. The final crowns were also undercontoured subgingivally, but normal anatomical contours were established supragingivally (Fig. 11). The crowns were cemented with temporary cement (Figs. 12 and 13). The crowns were followed up for 2 years and very acceptable esthetics have been achieved (Figs. 14 and 15). The TissueCare Concept of Ankylos provides long-term hard- and soft tissue stability. The x-rays prove a very stable bone over the implant shoulder which is the prerequisite for the perfect formation of the soft tissue (Figs. 16 and 17).

DISCUSSION

Patients with thin gingival biotypes who require dental implants are very challenging. This type of tissue is prone to recession and not able to mask the color of the metal abutments effectively. Especially in cases where immediate implants were placed, many authors highlighted the importance of the integrity of the buccal plate. However, no study has been performed in order to look at the thickness of the existing buccal plate so far. Nevins et al. have looked at the presence of natural occurring bony dehiscence in prominent roots of the maxillary central incisors and canines and its effects on the soft tissue. With the aid of a non-resorbable grafting material, the loss of volume at the extraction site was reduced. Araujo et al. have investigated the loss of the crestal labial plate after extraction of teeth induced by bundle bone. With this loss of bone, gingival recession may occur especially in thin gingival biotype cases. Furthermore, Araujo et al. have also observed a flattening of the labial contours. With these problems in mind, it is our opinion, that the application of a non-resorbable grafting material is useful, as this can form a scaffold to support the soft tissue. The buccal plate therefore serves as a wall to keep the grafting material in position, especially in the crestal region, in order to prevent resorption after the extraction.

The long-term maintenance of the crestal bone with functional loading of the implant restoration is important since it will affect the long term stability of the soft tissue too. Kan et al. have shown gingival recession of immediate implant cases accompanied by buccal bony defects after one year of functional loading. They have attributed this problem to the defects that occurred around the buccal plate and the presence of thin gingival tissues.

Linkevicius et al. have shown that the maintenance of the crestal bone also depends on the thickness of the soft tissue. This is even more important in thin gingival biotype cases. It is our opinion that the use of Ankylos with its special TissueCare connection allows for achieving more soft tissue thickness by the system immanent platform-switch providing more space for the soft tissue to develop. As a further advantage, thicker soft tissues help to mask the discolorations caused by metal abutments (Fig. 6). The use of ceramic or zirconium abutments would have been an alternative indeed, but the authors' cases were all restored with metal abutments. As the metal was masked effectively (Figs. 14 and 15), none of the cases required additional soft tissue augmentation.

The control of the shape and extent of the provisional and

9, 10_ Soft tissue conditions six weeks after surgery
11_ Final porcelain-fused-to-metal crown undercontoured subgingivally
12, 13_ Delivery of final prosthesis
14, 15_ Two years post operative conditions
16, 17_ Two years post operative radiographs

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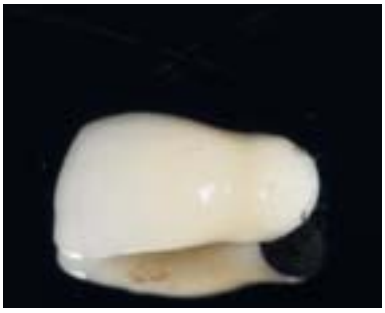

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final restorations is important. Overcontouring may cause soft tissue recession, especially in the subgingival area. We do not recommend the use of ideally contoured crowns as this causes compression of the soft tissue and thus certainly leads to gingival tissue recession. Thus, the ideal contours were only created supragingivally.

CONCLUSION

The management of the bone and soft tissue during surgery as well as the control of the provisional and final restoration is important to control the surrounding soft tissue. The presented protocol may provide a possible technique to deal with thin gingival biotype cases. ■

Literature available on request from the authors

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