

Case Report on the use of bone level implants in an esthetically demanding case

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Introduction

Since the introduction of Straumann® Bone Level implants to the market, esthetically challenging cases can now be managed where Straumann® Tissue Level implants were previously contra-indicated. The importance of the correct three dimensional surgical placement of implants to achieve acceptable clinical and esthetic results is well documented.¹ Limited interdental space and loss of buccal bone volume, especially where two or more teeth have been lost, have proven to be challenging esthetic cases. The bone volume can be preserved after extraction, or deficient areas can be predictably augmented by means of procedures using autogenous bone, with or without synthetic bone graft substitutes such as Straumann®

BoneCeramic.^{2,3} While limited interdental space cannot be changed, the use of narrower platform implants emerging from the level of the bone has proved to produce predictable esthetic results.

Case Presentation

In the following case, a 30 year old male lost his two central incisors as a result of a traumatic incident. He presented with a removable plastic partial denture in position, replacing these two teeth. (Figures 1,2,3). His lower right central incisor was also devitalized during this incident, with subsequent discoloration and the development of a periapical radiolucent lesion. The ridge contour seemed to be well preserved and the interdental space measured



Figure 1: Pre operative panoramic xray.

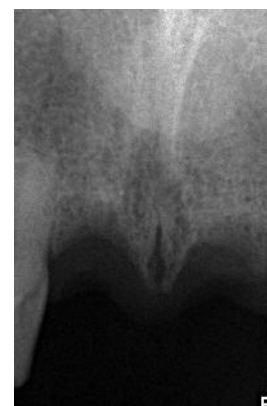


Figure 2: Intra-oral radiograph, note the preservation of the inter dental bone spike 11/21.

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Figure 3: Pre operative presentation with the socket fit plastic partial denture in position.



Figure 4: Pre operative situation, note the preservation of the papillae between 11/21.



Figure 5: Inter dental space measured 14,6 mm, note the deficient buccal bone volume.

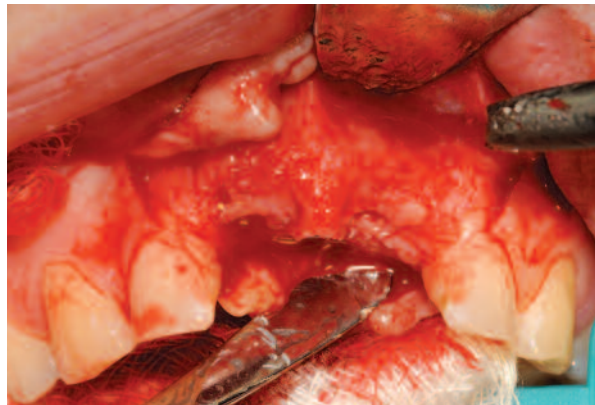


Figure 6: Full thickness flap with vertical relief incisions from the center of the adjacent lateral incisors.

14.6.mm. The previous interdental papilla was also well preserved. (Figures 4, 5) A decision was made to place two adjacent 12 mm, 4.1mm Regular Crossfit™ (RC) Straumann® Bone Level Implants. (SLActive).

Surgery

A full thickness, with two vertical incisions flap, with a broad base was made (Figure 6) and the pilot drill osteotomies were done to determine parallelism

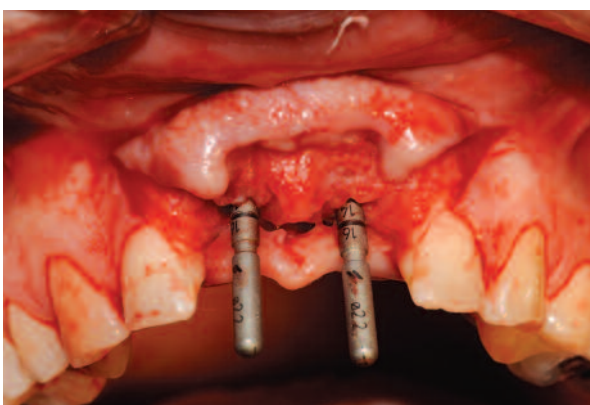


Figure 7: Pilot drills showing parallelism and distance between implants, as well as adjacent teeth.



Figure 8: Palatal positioning of the implants.

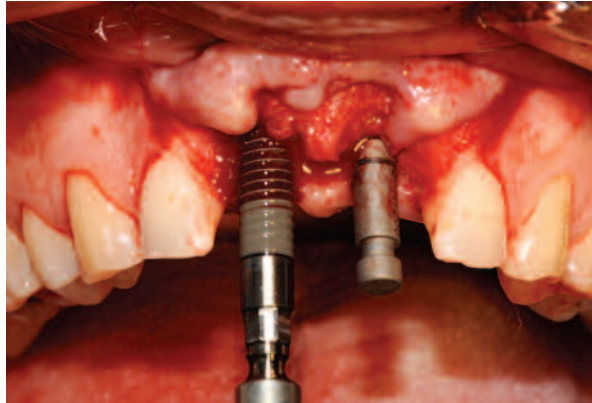


Figure 9: 12mm length, 4.1mm diameter Straumann® BoneLevel™ with SLActive surface implants were inserted. Note the shiny wet surface of the implant.

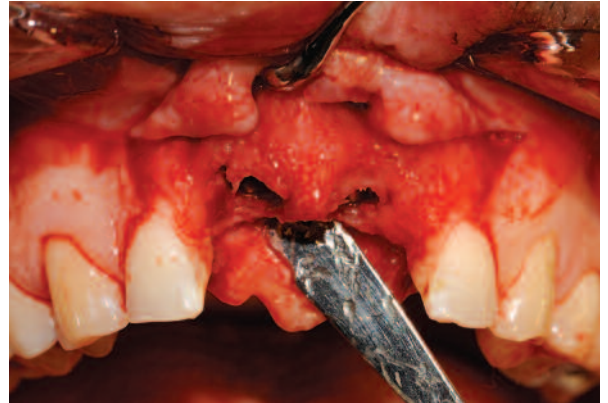


Figure 10: Note the depth of implant placement, subcrestal, 3,5mm below adjacent CEJ's.

(Figure 7). The implants were planned in a palatal position (Figure 8) to preserve the buccal bone plate and allow screw retained restorations with a predictable esthetic outcome. After continuing through the drill sequence the implants were inserted (Figure 9). Note the depth of

placement of the implants, 3,5mm below the adjacent cemento-enamel junctions (Figure 10).

With the 3 mm healing caps in position (Figure 11), autogenous bone collected in a bone trap was used to additionally augment the buccal bone volume and

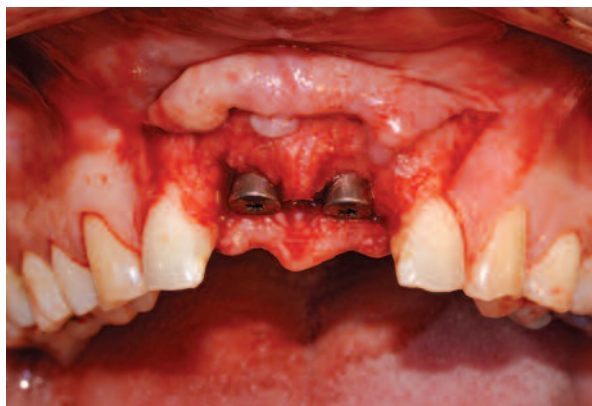


Figure 11: 3mm healing caps in position.



Figure 12a and b: Autogenous bone harvested with bone trap placed buccally to enhance buccal volume.

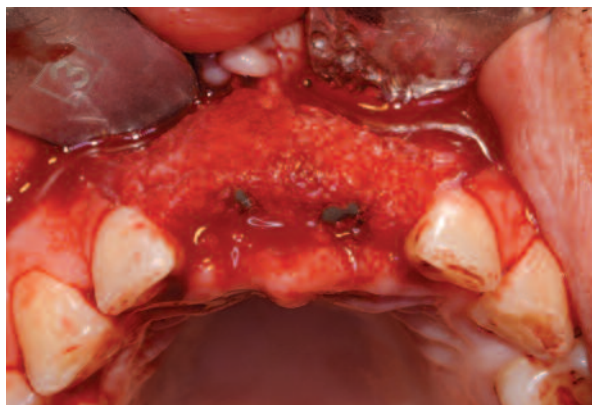


Figure 12b

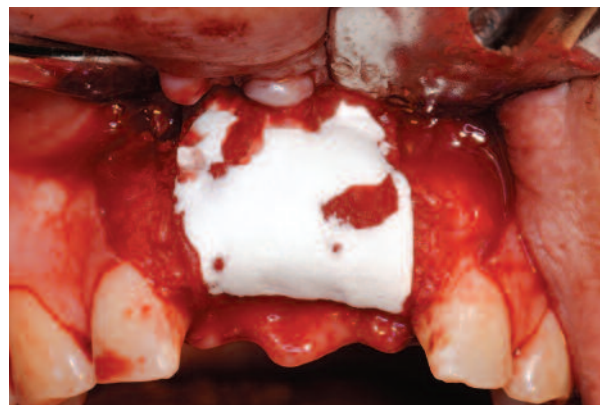


Figure 13: Collatape collagen membrane placed over autogenous bone.

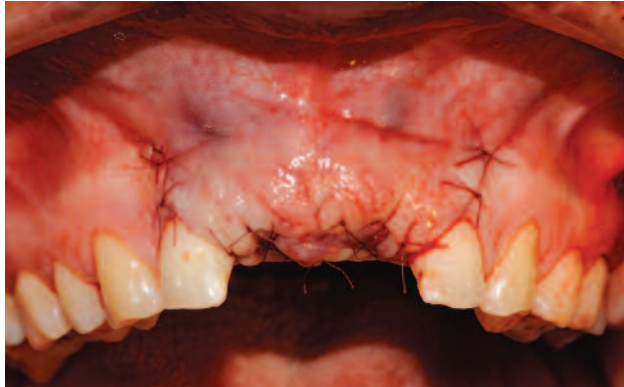


Figure 14: Wound closure with coronally repositioned flap.

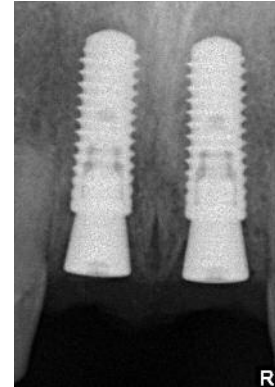


Figure 15: Six weeks submerged healing with 3mm healing caps in position.



Figure 16a and 16b: Adaptation of existing partial denture to accommodate extra bulk of tissue.



Figure 16b

contour. The bone trap was connected to a separate suction, used only during the drilling of the osteotomies (Figures 12a and b). This was covered with a collagen membrane (Figure 13) before wound closure with polylactic acid sutures (Figure 14). The flap was coronally

repositioned after relieving the periostium. The implants were left to heal submerged for six weeks (Figure 15).

The existing partial denture was adapted to accommodate the extra bulk of tissue. (Figures 16a and b).



Figure 17: Situation after six week healing period.



Figure 18: Punch exposure and connection of 5mm healing caps.



Figure 19: Radiograph after exposure.



Figure 20: Presentation of soft tissue prior to impressions for restoration.

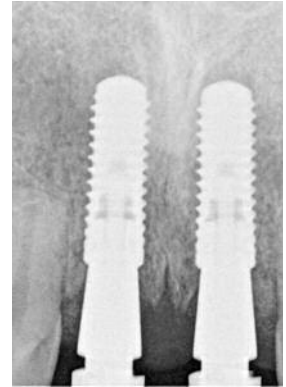


Figure 21: Verification of impression copings on radiograph.

After six weeks healing was allowed (Figure 17), the implants were exposed by means of a tissue punch and 5mm healing caps (Figures 18, 19).

Restoration

After initial healing the patient was referred for the restorative phase (Figures 19, 20). Open tray impression copings were connected and the positive positioning verified with an digital x-ray (Figures 21, 22). A stock tray and polyvinylsiloxane two phase impression material were used to record the position of the implants (Figures 22, 23) No soft tissue contouring has been done at this stage, mainly due to the unavailability and financial restrictions of the patient.

Gold abutments fitting the CrossFit™ connection were used to wax up and cast on the ideal envisaged emergence profile of the two individual incisors. Porcelain

was fused to these abutments to produce screw retained individual crowns (Figures 24, 25, 26). Due to the depth of the implants and narrow profile of the soft tissue, screw retained crowns are required to be able to produce enough pressure to be able to seat the restorations. Note the blanching of the soft tissue immediately after the seating of the restorations (Figures 27, 28, 29). As no soft tissue profile was generated before the final crowns were connected, these crowns should be connected with caution to prevent over “stretching” of the soft tissue.

The precise and snug connection of the CrossFit™ connection can be seen on the post operative radiograph (Figure 30). Also note the level of the bone in relation to the implant level and horizontal offset. This will nourish and support the soft tissue volume and profile as seen 12 days post insertion (Figure 31,32).

After 12 months the soft tissue profile and bone



Figure 22: Impression copings connected.

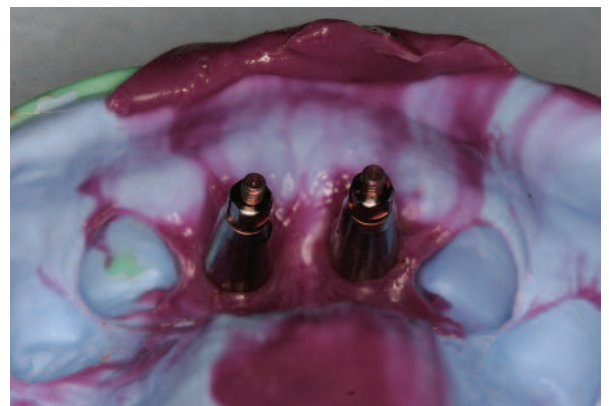


Figure 23: View of impression with impression copings picked up with two phase putty wash poly vinyl siloxane impression material. (Aquasyl from Dentsply).

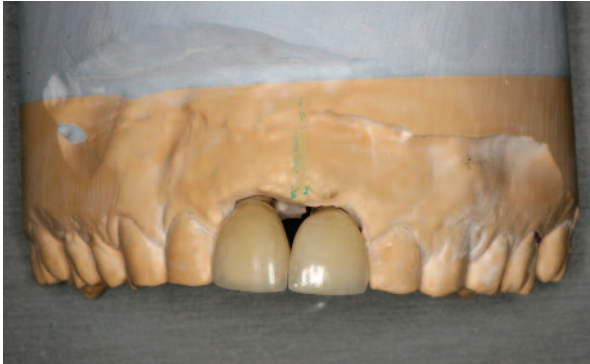


Figure 24: Laboratory model with completed restorations. Note the space left for the soft tissue remodeling.



Figure 25: Note the shape of the restorations to be connected to allow soft tissue regeneration and anatomic profile.

around the implants are stable and healthy with an overall very pleasing esthetic result (Figures 33, 34).

Conclusion

With the correct three dimensional placement of implants, even in limited space and esthetically challenging areas, two adjacent implants can be inserted and restored with a long term predictable outcome. The esthetic outcome of these cases are

totally dependent on the perfect positioning of the implants. It is imperative that the clinician and dental technician have the appropriate knowledge and experience in such challenging cases to achieve predictable results, both for function and esthetics. With Implants in the correct position, with sufficient surrounding tissues, and knowledge of the prosthetic shapes and space, final restoration can be finalized with great predictability.



Figure 26: Note the buccal concavity to predict the gingival margin height.



Figure 27: Connection of the crowns, to the implants. Note the blanching of the soft tissue to adapt to the shape of the restorations.



Figure 28: Screw access holes in singulum positions, perfectly positioned implants.



Figure 29: Closer view of soft tissue blanching immediately after connection of the restorations. This should disappear within 10 minutes after connection.

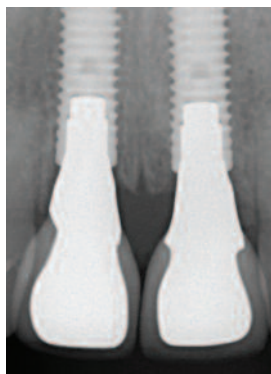


Figure 30: Radiograph of the connected crowns to verify the positive seat of the crossfit connection.



Figure 31: Palatal view 12 days post insertion of the restorations.



Figure 32: Frontal view 12 days post insertion of the restorations, note the natural colour and shape of the soft tissue.

Acknowledgement

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References

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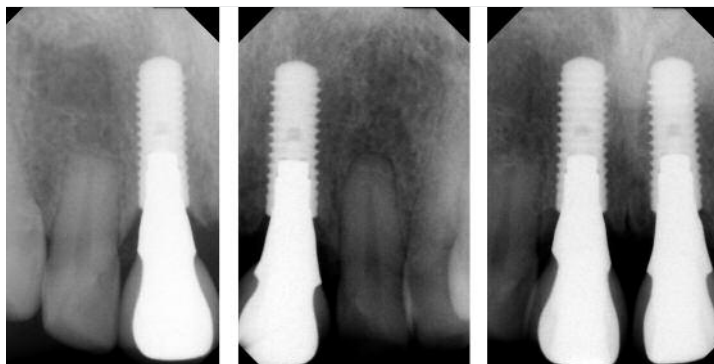


Figure 33: Radiograph 1 year post insertion of the restorations, note the preservation of the marginal bone level.



Figure 34: Frontal view 1 year post insertion of the restorations. Note the natural soft tissue profile and volume.