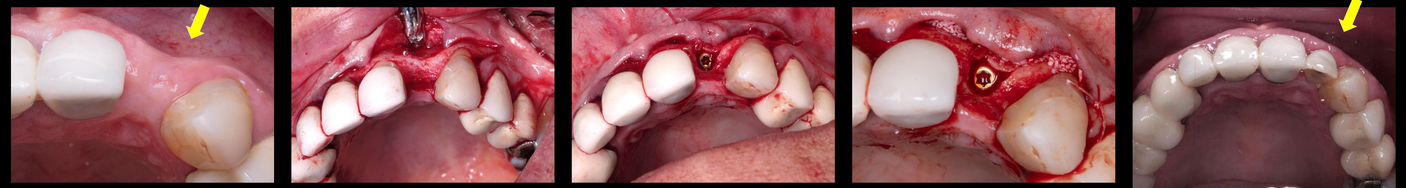
Clinical Experience of Sequential Treatment with Xenograft and Connective Tissue Graft to Enhance Esthetic Outcomes in Implant Restorations

Jun Suk Daniel Lee, Marco Vinattieri, Chih Hao Scott Shyu, Maryse Manasse, Yung Cheng Paul Yu, Stuart Froum, Sang-Choon Cho, Leena Palomo
Ashman Department of Periodontology and Implant Dentistry New York University College of Dentistry

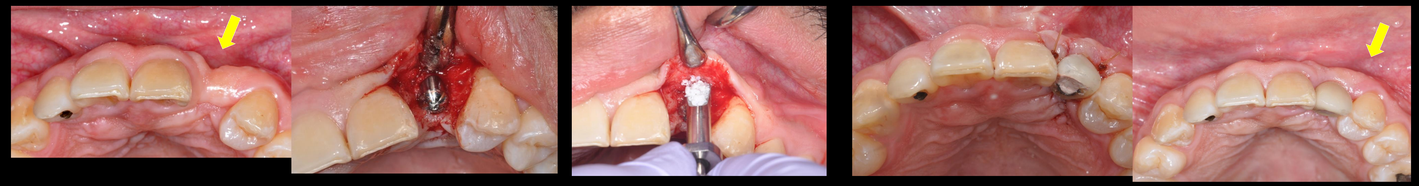
Dental implant restoration has evolved into a predictable procedure, with success dependent not only on osseointegration but also on achieving esthetic restoration. A key factor in esthetic restoration is the establishment of a harmonious gingival contour that seamlessly integrates with the neighboring dentition. Several techniques, such as connective tissue grafting (CTG), buccal plate preservation, and the dual zone technique in immediate implant cases, have been reported to achieve this goal. Despite these advancements, there remain limitations and disadvantages in certain cases, particularly in building labial contour.

Our group has recently reported successful results using xenografting during stage 2 surgery to address these challenges. Nevertheless, some cases continue to present difficulties in creating the desired labial contour. In light of these considerations, this case report presents a combined technique that combines xenografting and CTG to establish predictable gingival contour in simple dental implant restoration. The primary purpose of this report is to demonstrate the techniques employed and the key considerations necessary for achieving optimal aesthetics and function in such cases.

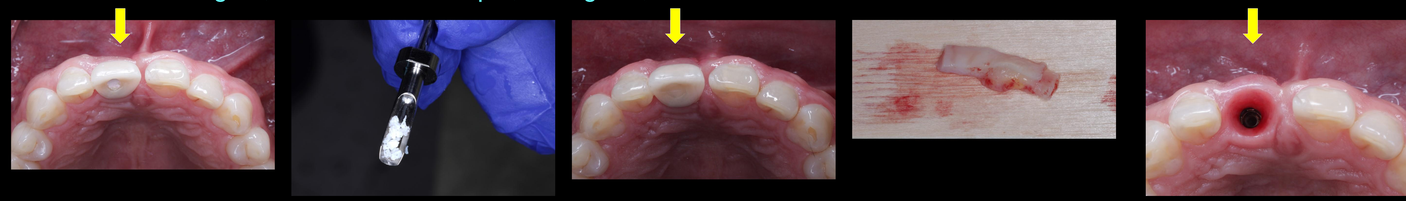
Case 1: Missing #10, CARS and simultaneous implant placement, Grafting during stage 2 surgery



Case 2: Missing #10&11, implant with GBR, xenograft at stage 2 surgery



Case 3: Missing #9, dual-zone technique, xenograft , CTG



1. Kan JYK, Yin S, Rungcharassaeng K, Zucchelli G, Urban I, Lozada J. Facial implant gingival level and thickness changes following maxillary anterior immediate tooth replacement with scarf-connective tissue graft: A 4-13-year retrospective study. J Esthet Restor Dent. 2023 Jan;35(1):138-147.
2. Kan JY, Rungcharassaeng K, Morimoto T, Lozada J. Facial gingival tissue stability after connective tissue graft with single immediate tooth replacement in the esthetic zone: consecutive case report. J Oral Maxillofac Surg. 2009 Nov;67(11 Suppl):40-8
3. Grunder U, Gracis S, Capelli M. Influence of the 3-D bone-to-implant relationship on esthetics. Int J Periodontics Restorative Dent. 2005 Apr;25(2):113-9.
4. Fürhauser R, Florescu D, Benesch T, Haas R, Mailath G, Watzek G. Evaluation of soft tissue around single-tooth implant crowns: the pink esthetic score. Clin Oral Implants Res. 2005 Dec;16(6):639-44.
5. Chu SJ, Salama MA, Salama H, Garber DA, Saito H, Sarnachiaro GO, Tarnow DP. The dual-zone therapeutic concept of managing immediate implant placement and provisional restoration in anterior extraction sockets. Compend Contin Educ Dent. 2012 Jul-Aug;33(7):524-32, 534. PMID: 22908601.
6. Tavelli L, Zucchelli G, Stefanini M, Rasperini G, Wang HL, Barootchi S. Vertical soft tissue augmentation to treat implant esthetic complications: A prospective clinical and volumetric case series. Clin Implant Dent Relat Res. 2023 Apr;25(2):204-214.
7. De Carle L, Froum S, Maketone P, Grisa A, Lima E, Malz A, Cho SC. Treatment of soft tissue depression with a xenograft bone substitute at the second stage of an implant procedure: A case report. Int J Periodontics Restorative Dent 2023;43:23-27
8. Stuart Froum, Miltiadis Lagoudis, Giovanni Molina, Takanori Suzuki, Sang-Choon Cho. The new surgical protocol to create interimplant papilla: The preliminary results of a case series. 2016, Nov No 2
9. Stuart J. Froum, Sang-Choon Cho, Salvatore Florio, Craig M. Misch. Use of Narrow-Diameter Implants in Treatment of Severely Atrophic Maxillary Anterior Region With Implant-Supported Fixed Restorations. COMPENDIUM May 2016
10. Amin PN, Bissada NF, Ricchetti PA, Silva AP, Demko CA. Tuberosity versus palatal donor sites for soft tissue grafting: A split-mouth clinical study. Quintessence International. 2018 Jul 1;49(7).
11. Stuart J. Froum, Wendy Chia-Wei Wang, Tarek Hafez, Takanori Suzuki, Yung Cheng Paul Yu, Sang-Choon Cho. Incision Design and Soft Tissue Management to Maintain or Establish an Interproximal Papilla Around Integrated Implants: A Case Series. Int J Periodontics Restorative Dent 2018;38:XXX–XXX.
12. Ye Shi, Inés Fernández Guallart, Mashal Alrajhi, Sang-Choon Cho, Stuart J. From. Reconstructing Peri-implant and Papillary Soft Tissue in the Esthetic Area Using Interdental Tissue, a Tuberosity Connective Tissue Graft, and a Tunneling Approach: A Case Report. Compendium 2022 October 2-7.