Otto Zuhr Marc Hürzeler

PLASTIC-ESTHETIC PERIODONTAL AND IMPLANT SURGERY

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A Microsurgical Approach

With the support of Bärbel Hürzeler and Stephan Rebele

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for Kira,
Emma, Paula, and Oskar

Preface

One of the really significant stories relating to the creation of this book happened at the beginning of 2005, in our old apartment in Munich, Germany. Like so often, my little daughter Emma was sitting beside me at my desk chatting while I was working at the computer, desperately trying to make some progress on the book manuscript. I can still remember the exact moment when she suddenly changed the subject and more or less asked me pointblank what color the book would be. Taken by surprise, I tried to explain to her that I had just started working on the book and that the last thing on my mind at that moment was the color of the book. However, she did not let up. To make a long story short, I finally had no other choice but to actually swear on my "great princess's honor" that the cover of the book, should it one day ever get finished, would be printed up in her favorite color. So it happened that I had to insist on having the book bound in pink despite the serious concerns raised by the publisher. In the end, the responsible parties at Quintessence accepted under protest. My reason for choosing that color, therefore, was not to attract more attention or to make allusions to "pink esthetics" but solely to honor my reckless promise to my daughter Emma, whose favorite color is pink…

At this point, I would like to extend my sincere gratitude and appreciation to the senior management of Quintessence Publishing—Horst-Wolfgang Haase, Alexander Ammann, Christian Haase, and Johannes Wolters—not only for bearing with my color choice but also for the great confidence and trust they have placed in me, for their enduring patience throughout this book project, which was indubitably trying at times, and, not least, for their tremendous support, cooperation, and partnership over the last few years. Many thanks also to Janina Kuhn, Ina Steinbrück, Valeri Ivankov, and Peter Rudolf for turning the manuscript into an actual book. In particular, I am deeply indebted to Peter Rudolf, who gave me the reassurance and peace of mind straight from the beginning that he was doing everything possible to make this book the best it could be. Thanks also to Christine Rose, Florian Curtius, Andreas Dollinger, and Jens Hoepfner for processing the clinical photographs for print and to the Quintessence TV team of Gerd Basting, Martin Jakovljevic, Fabian Pietsch, and Ireneusz Watola for producing the videos for the accompanying video compendium. Credit also goes to Angelika Kramer for her dedication and commitment in preparing the drawings and to Stefan Bogner, Annette Bauer, and Stephen Wittmann for their assistance in developing the layout for this book. My thanks also go to Suzyon O'Neal Wandrey for the English translation and to Chee Wan Ang for the enormous effort he undertook in proofreading the English version of this manuscript.

Furthermore, I would like to take this opportunity to thank all of my teachers, even if it is not possible to mention every single one of them by name here and now. In my years as a dentist and periodontist, I have had the extraordinary luck to work with a lot of great personalities in our field. I was not only able to see them in action and learn from these great teachers but also had the chance to engage in intense discussion, discourse, and debate with some of them on a large number of topics. In particular, I would like to thank Wolfgang Bolz and Hannes Wachtel for their long-standing support of my professional development and for many inspiring years of common ground…

Looking back, I can hardly put into words how much time and energy have actually gone into work on this book. This inevitably led to gaps in coverage of the daily needs and requirements for quality-oriented practice management and treatment, which had to be compensated for and closed by others. In this context, my most profound thanks to my dental practice team, Bärbel Hürzeler, Marc Hürzeler, Wolf Richter, and all our hard-working dental assistants, dental hygienists, and administrative staff: Thank you for your open-minded and sincere teamwork and for your ceaseless and unswerving pursuit of our ultimate goal of making patient care at our dental practice a little bit better each day, year after year. To Stefan Fickl, who stepped in to help us when we had just started and were short-handed, many thanks indeed. In addition, I owe my respect to the ar-

tist and sculptor Gerd Bischur, who was instrumental in the creation of object images and provided support in all aspects relating to digital photography. I am also deeply indebted to the dental laboratory technicians who performed all the prosthetic work in the scope of this book project and who have basically been a part of my team ever since I started my professional life: Rainer Janousch, Uli Schoberer, and Uli Werder. My special thanks go to Uli Schoberer for his exceptional analytical, creative, and technical skills, for his fundamental belief that a treatment outcome that is inferior to that which is technically feasible is never acceptable, and for his spirit of brotherhood.

The idea of having the book manuscript critically reviewed from the student perspective prior to its final completion proved to be a correct and rewarding decision: I would like to thank Stephan Rebele not only for drafting the rough sketches of the illustrations in this book but also for critically reading and creatively evaluating the manuscript. His input ultimately led to didactically valuable changes and additions in different parts of the book. I am also deeply indebted to Bärbel Hürzeler for the enormous amount of time she spent proofreading our manuscripts without complaint at various stages of development of this book, for the razor-sharp intellect with which she consistently enriched and constructively supported the book's development, and for her big heart.

Last but not least, I would like to thank Marc Hürzeler for his unparalleled way of practicing dentistry with a passion that is irresistibly motivating and contagious, for always being a model of partnership and team spirit for me, for standing by me all these years, and for helping whenever I needed him, without exception, without question, and without having to be asked: I feel extremely grateful and fortunate that our paths crossed. Without you, this book would never have become reality—my colleague, partner, very best friend…

With the deepest respect, I would like to thank my parents, Marianne and Otto, and my sisters, Marianne and Barbara, for showing and setting the example for me of what a home and family should be, for always allowing me to be who I really am, and for giving me their unconditional love.

From the bottom of my heart, I would most like to thank my children, Emma, Paula, and Oscar, for opening my eyes and, especially, my wife, Kira, for her enduring strength, serenity, and wisdom and for the continuous flow of energy, warmth, and love with which she has supported and motivated me over the years—I could not imagine living without you for one second. I love you, to the moon and back…

Uffing (Germany), September 2011 Otto Zuhr

1 Uli S. 2 Stefan 3 Stephan 4 Wolf 5 Rainer 6 Gerd 7 Otto 8 Bärbel 9 Marc 10 Uli W.

It is our deepest conviction that the surgical potentials of the present can only be achieved by consistently following a surgical approach in which minimal soft tissue trauma and maximally perfect wound closure are key elements.

Contents

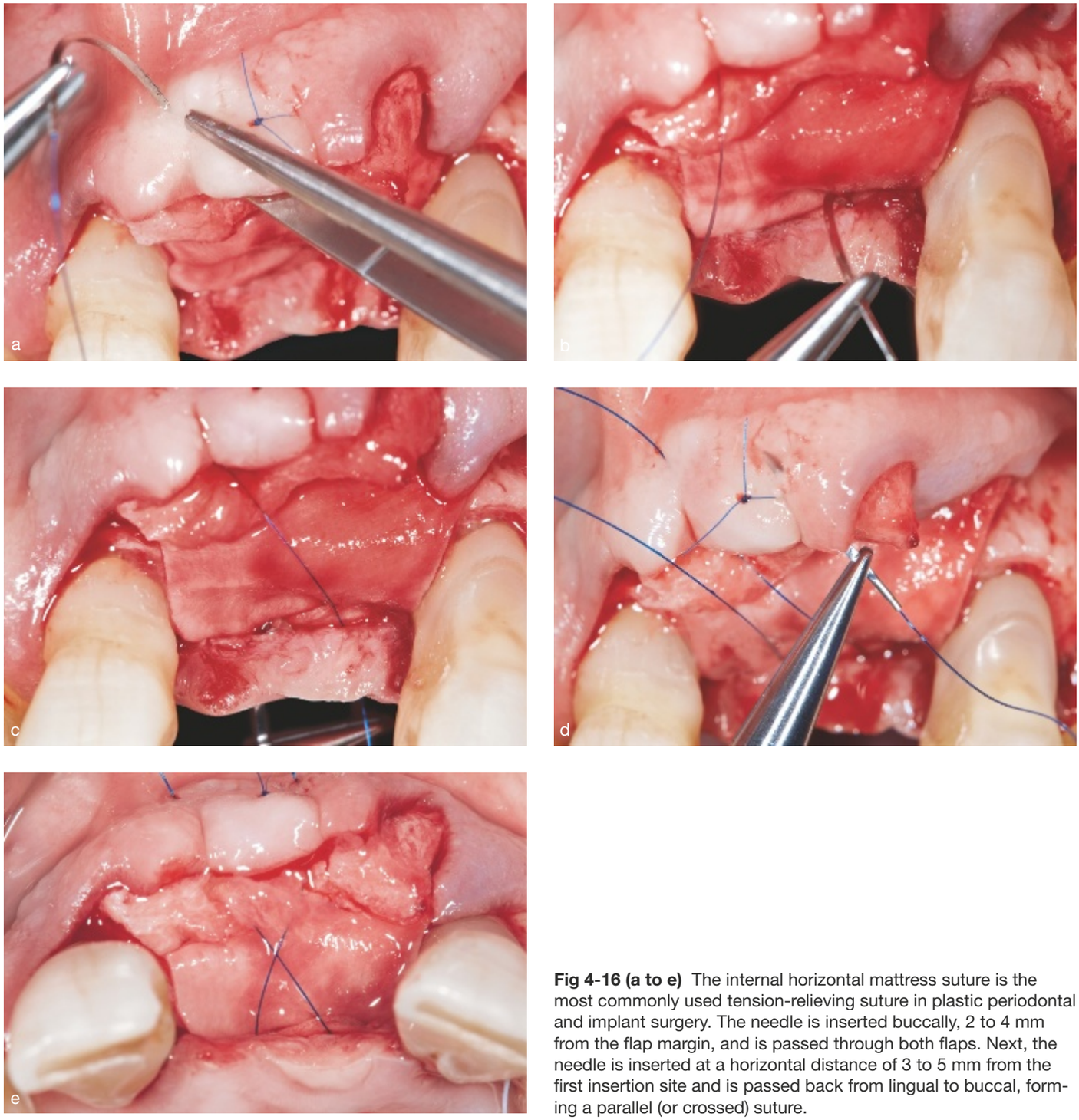


Fig 4-16 (a to e) The internal horizontal mattress suture is the most commonly used tension-relieving suture in plastic periodontal and implant surgery. The needle is inserted buccally, 2 to 4 mm from the flap margin, and is passed through both flaps. Next, the needle is inserted at a horizontal distance of 3 to 5 mm from the first insertion site and is passed back from lingual to buccal, forming a parallel (or crossed) suture.

horizontal, internal or external. The type best suited for relieving tension on the wound margins is the internal horizontal mattress suture. Internal horizontal mattress sutures result in eversion of the wound margins, which greatly simplifies closure with interrupted sutures or with one continuous suture. External mattress sutures often result in inversion of the wound margins, which complicates suture closure and promotes postoperative scar formation. Inverted wound margins can also complicate future scar correction.

For these reasons, the *internal horizontal mattress suture* is the type of tension-relieving suture most com-

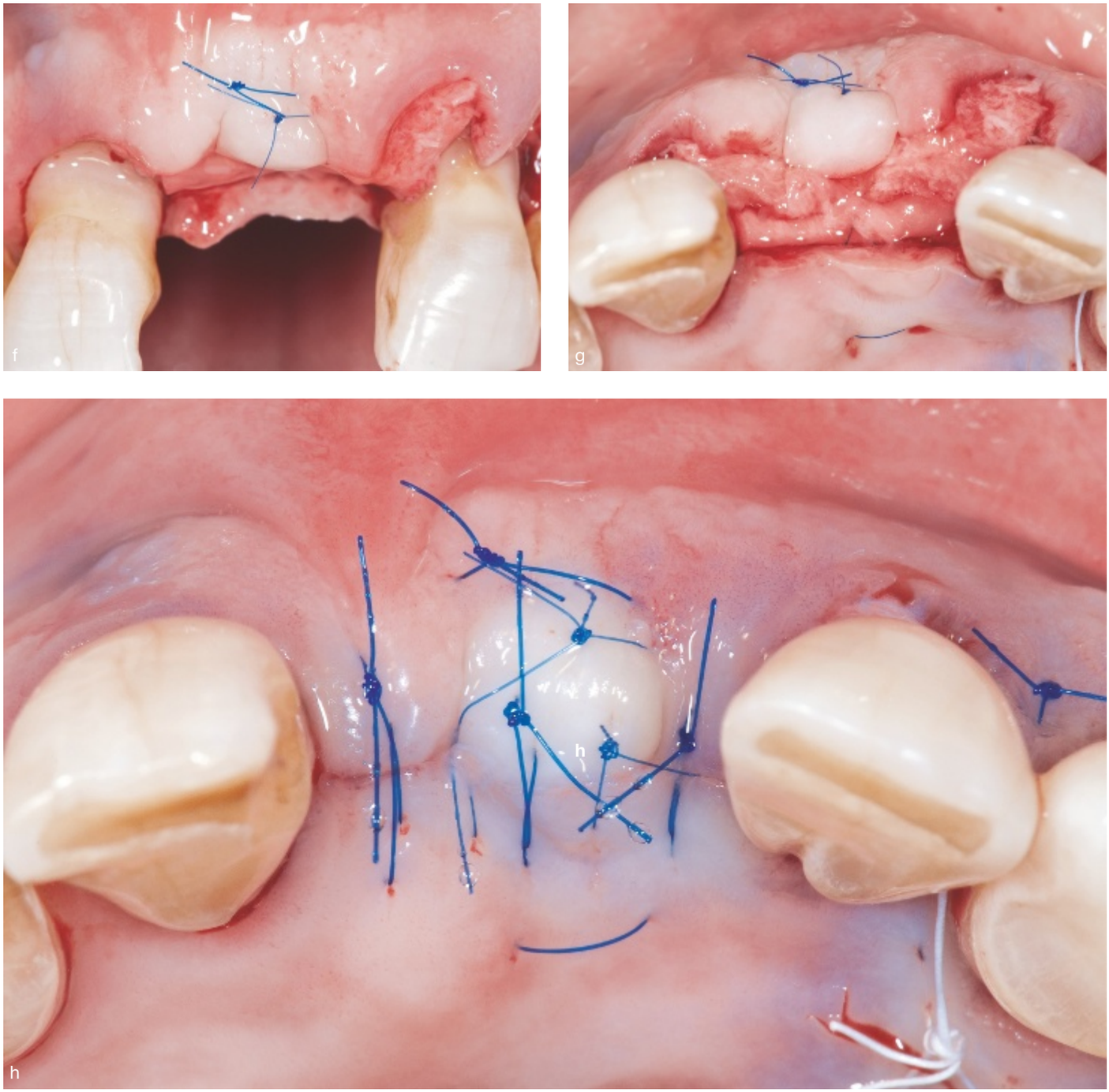


Fig 4-16 (f to h) Tension-relieving sutures facilitate tension-free approximation of the wound margins. When the knot is tied, the wound margins are everted, facilitating wound closure.

monly used in plastic-esthetic periodontal and implant surgery. The needle is inserted 2 to 4 mm from the flap margin and passed through both flap segments. At a horizontal distance of 3 to 5 mm from the first insertion site, the needle is passed back in the opposite direction, forming a parallel suture. After the last stitch, the suture is tied. The number of mattress sutures needed depends on the length of the incision. The actual wound closure sutures are placed after the tension-relieving sutures are finished (Fig 4-16). For a detailed description of the procedure, see chapter 13.

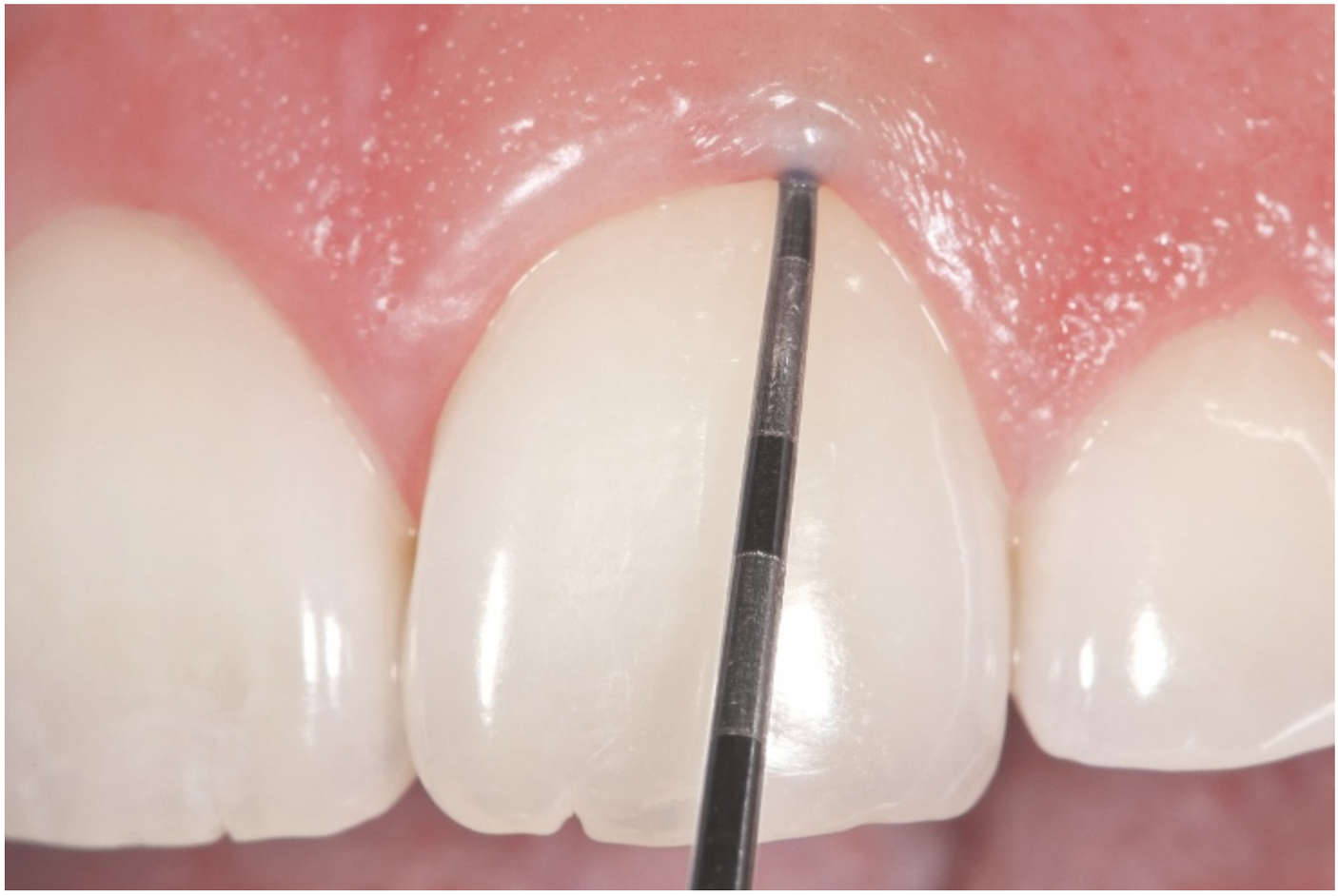


Fig 5-2 Periodontal health is a basic requirement for gingival esthetics.

5.1 Esthetic Criteria

Generally recognized and established criteria for gingival esthetics in terms of an esthetic and harmonious gingival morphology and gingival margin are described in the following sections.[14–16]

5.1.1 Gingival Health

Gingival and periodontal health is a basic prerequisite for an esthetic gingival morphology. Gingival inflammation not only produces pathophysiologic changes in the marginal periodontium but also causes changes in the color and surface texture of the gingiva. Inflamed gingiva bleeds easily and has a red, swollen, plump, and shiny appearance.

Therefore, a proper assessment of gingival esthetics can only be performed under inflammation-free periodontal conditions. The continuous personal oral hygiene motivation and support accompanying initial and supportive periodontal therapies are important for oral health and gingival esthetics.[15] Any dental treatment having a negative impact on gingival health in terms of biology and esthetics must be absolutely avoided for the same reasons (Fig 5-2).

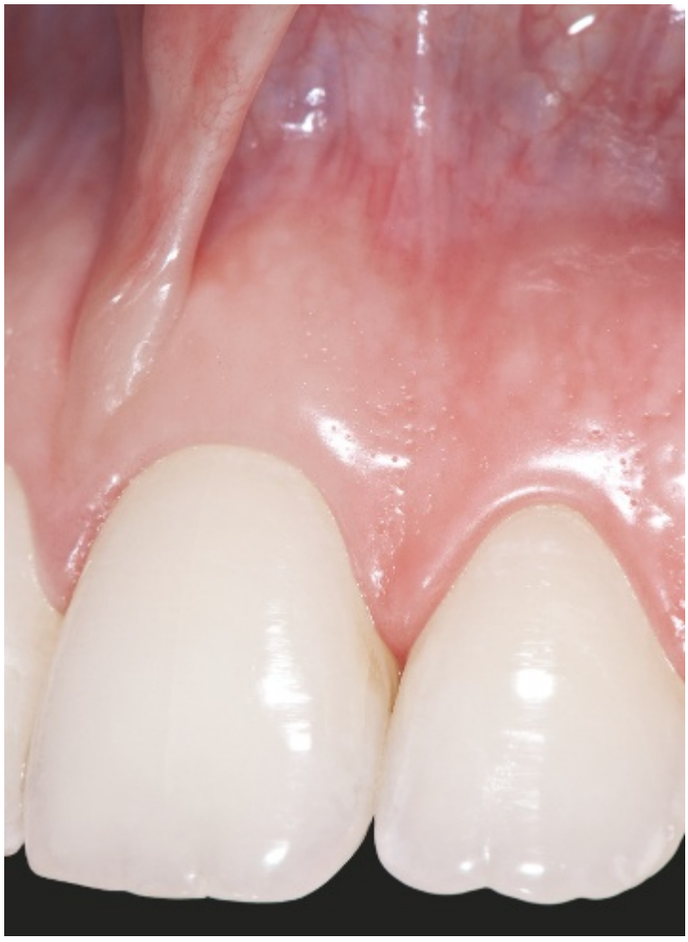


Fig 5-3 The alveolar mucosa is generally dark red and can be readily distinguished from the light pink gingiva.

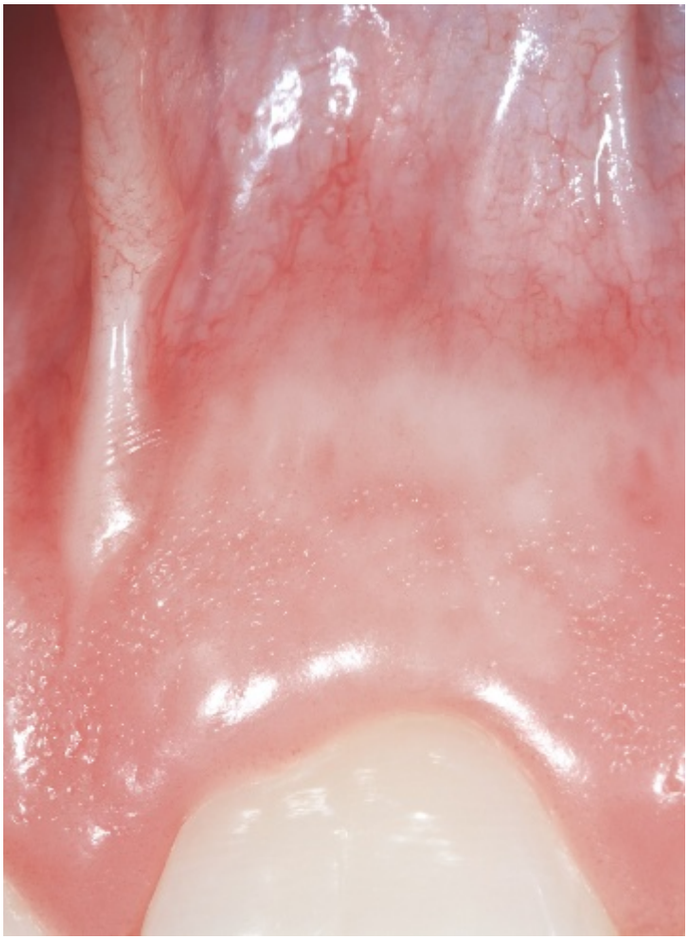


Fig 5-4 The surface of the gingiva is firm, dull, and stippled like an orange peel, whereas that of the alveolar mucosa is shiny and smooth.

5.1.2 Anatomical and Morphologic Features

Color

Healthy gingiva is light pink in color. Variably intense brownish pigmentation of the gingiva is not uncommon in dark-skinned individuals.[16]

The alveolar mucosa has a dark red color, making it readily distinguishable from the gingiva (Fig 5-3). Its dark color is attributed to the strong blood supply to the subepithelial connective tissue under a nonkeratinized and thus relatively translucent epithelium.

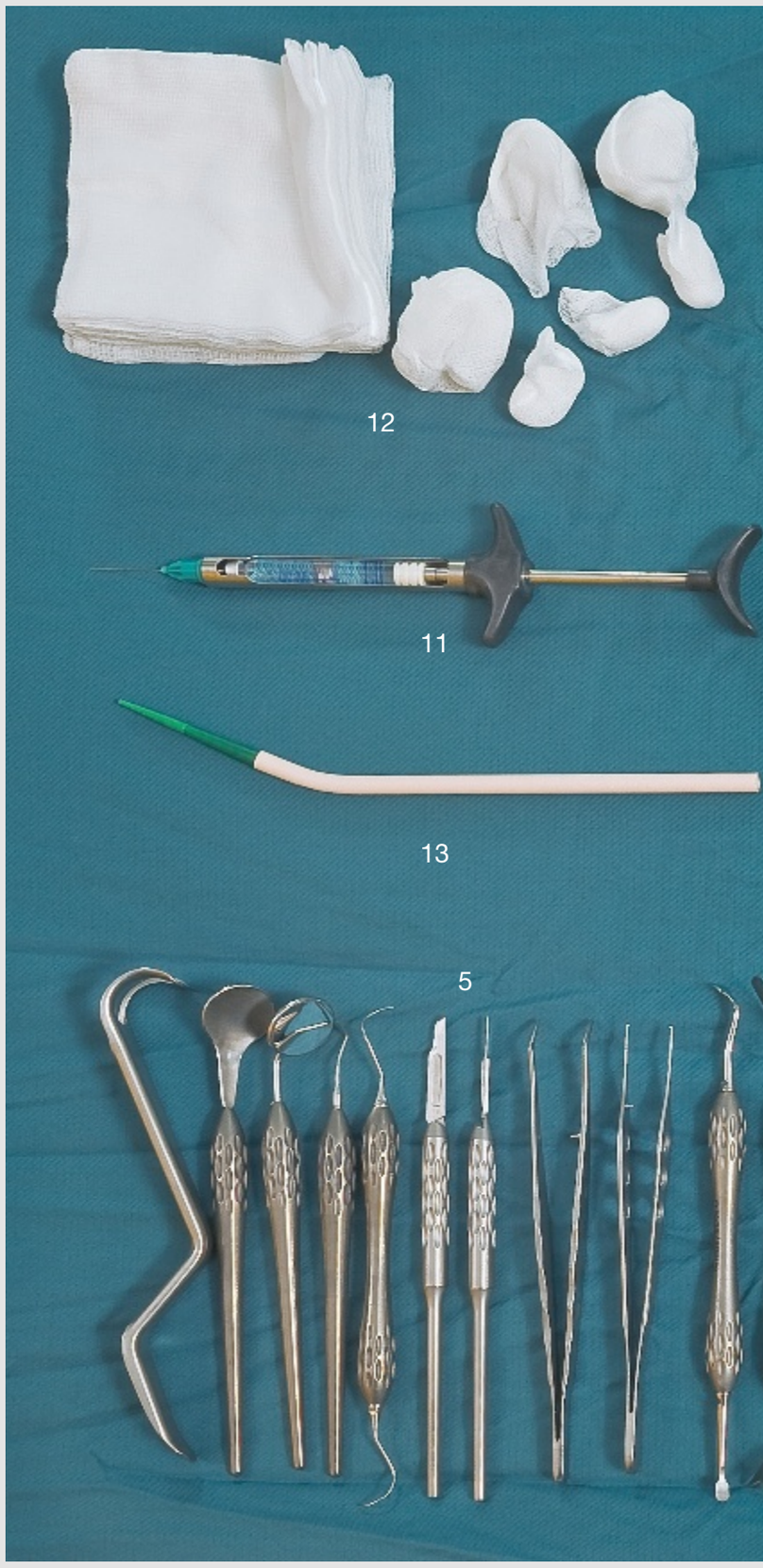
Surface texture

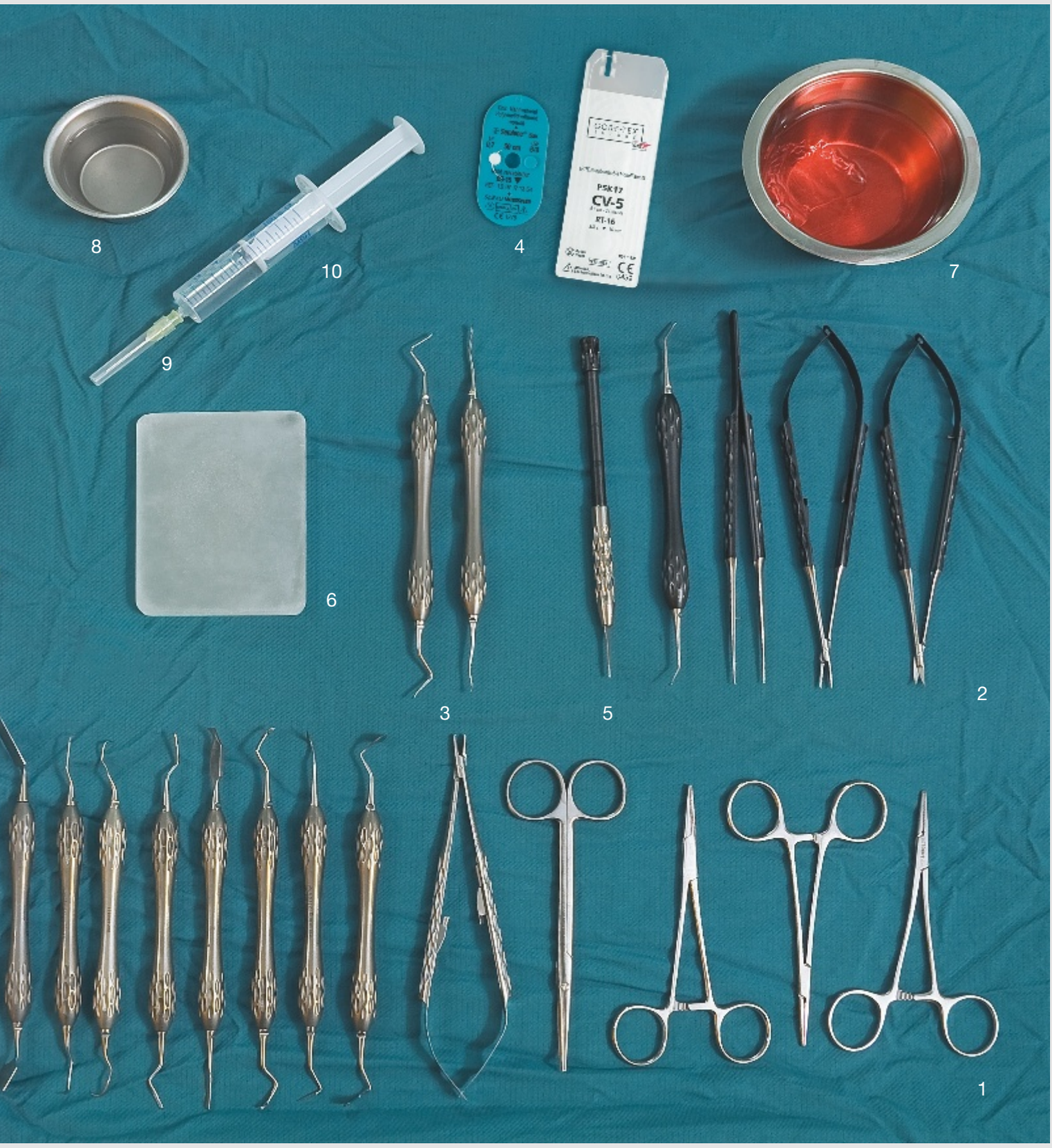
The surface texture of the healthy gingiva is mainly determined by the supracrestal fiber attachment of the subepithelial connective tissue to the keratinized gingival epithelium (see chapter 1). The epithelial surface of the attached gingiva bound to underlying alveolar bone often displays stippling (orange peel texture).[16] Evidence suggests that stippling is more pronounced in individuals with thick gingival biotypes than in those with thin biotypes.[7] Keratinization gives the gingival epithelium a firm texture and a dull surface appearance.

The adjacent alveolar mucosa has a shiny and smooth appearance that stands out against the background of the gingiva (Fig 5-4).

WORKPLACE PREPARATION CHECKLIST

1. Macrosurgical instrument set
2. Microsurgical instrument set
3. Tunneling blades I and II
4. Suture materials: Gore-Tex CV-5 and 6-0 Seralene DS-15
5. No. 15 macroblade and Keydent microblade
6. Glass slab
7. 0.1% chlorhexidine solution in a metal dish
8. Sterile water in a metal dish
9. Blunt cannula
10. 10-mL syringe
11. Local anesthetic
12. Large and small pledgets
13. Periodontal stent

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PSK17
CV-5
RT-16
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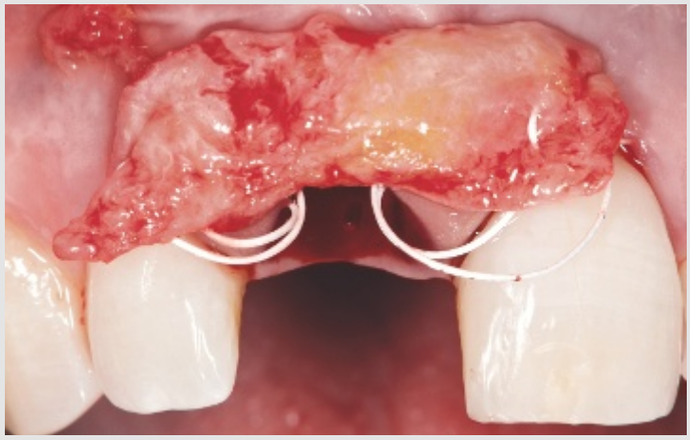
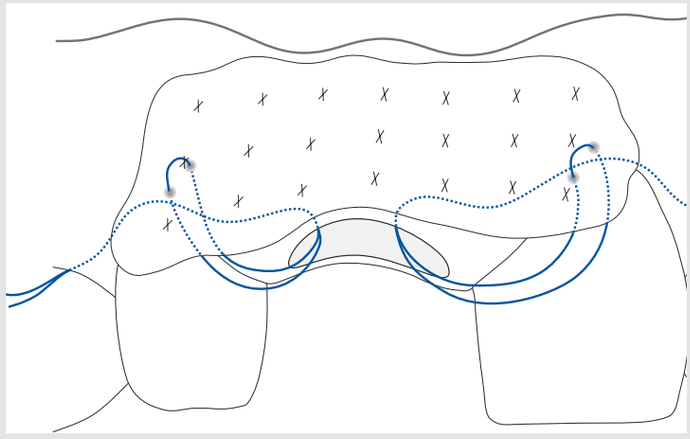
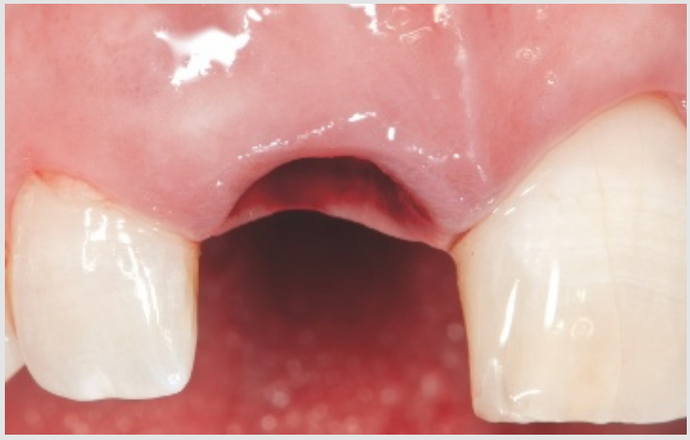
CHAPTER 10

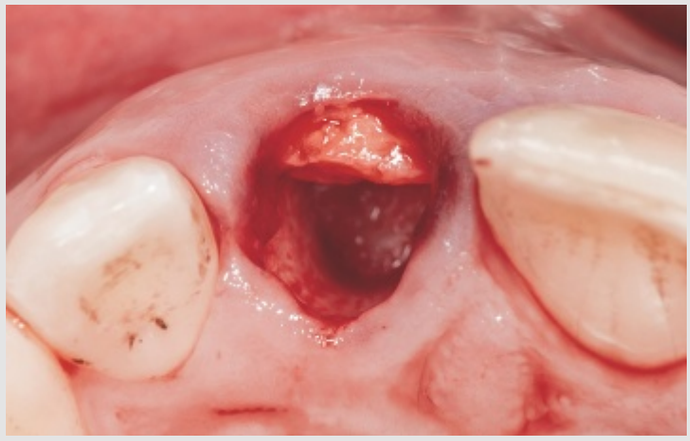
ESTHETIC CROWN LENGTHENING



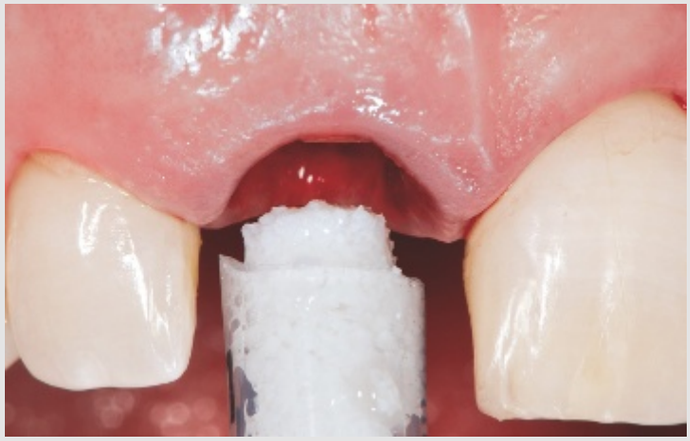


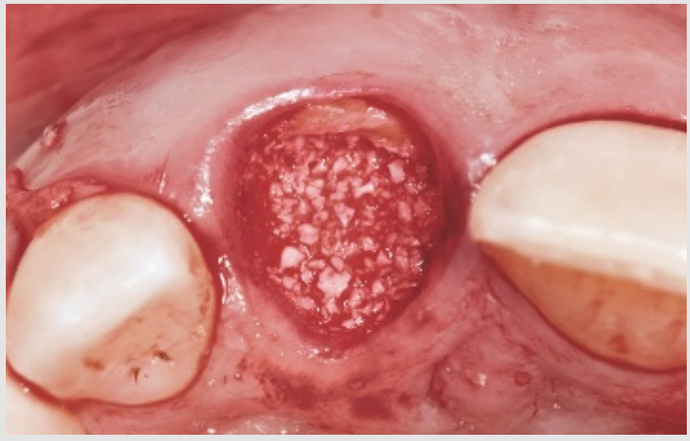
Figs 12-43 and 12-44 Positioning sutures made of Gore-Tex CV-5 have proved useful for graft positioning. The needle is inserted bluntly (back-first) into the tunnel one tooth lateral to the extraction socket and exits on the buccal side of the edentulous space. The needle engages the connective tissue graft laterally, from the inner to the outer aspect, and then, slightly more apically, from the outer to the inner aspect. The needle then passes back through the tunnel and returns to the starting point lateral to the edentulous space.





Figs 12-45 and 12-46 The graft is very precisely placed in the desired position by pulling on the sutures.





Figs 12-47 and 12-48 Bone substitute material (Bio-Oss) is placed in a metal cup, moistened with sterile saline solution, and loaded in an insulin syringe with the tip cut off. The material is carefully injected in the extraction socket and compacted with light pressure.

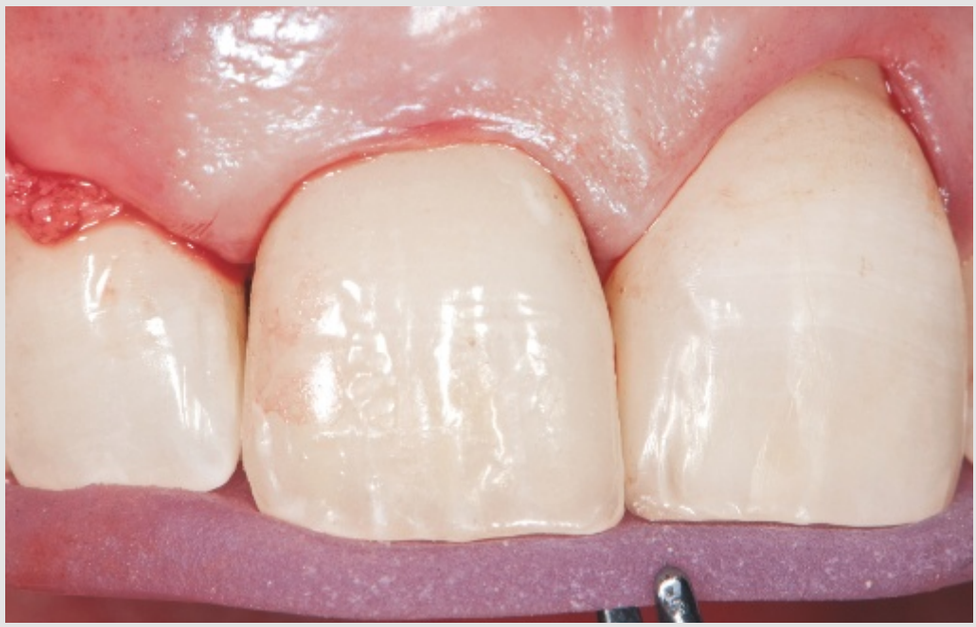


Fig 12-49 The provisional adhesive fixed partial denture is tried in. The base of the pontic must completely seal the filled extraction socket and provide a circular base of support to the overlying soft tissues. Exact placement of the provisional prosthesis in the planned position is crucial. A positioning guide is used for this purpose. When the provisional restoration is bonded, it is important to ensure that the wound is not exposed to phosphoric acid.

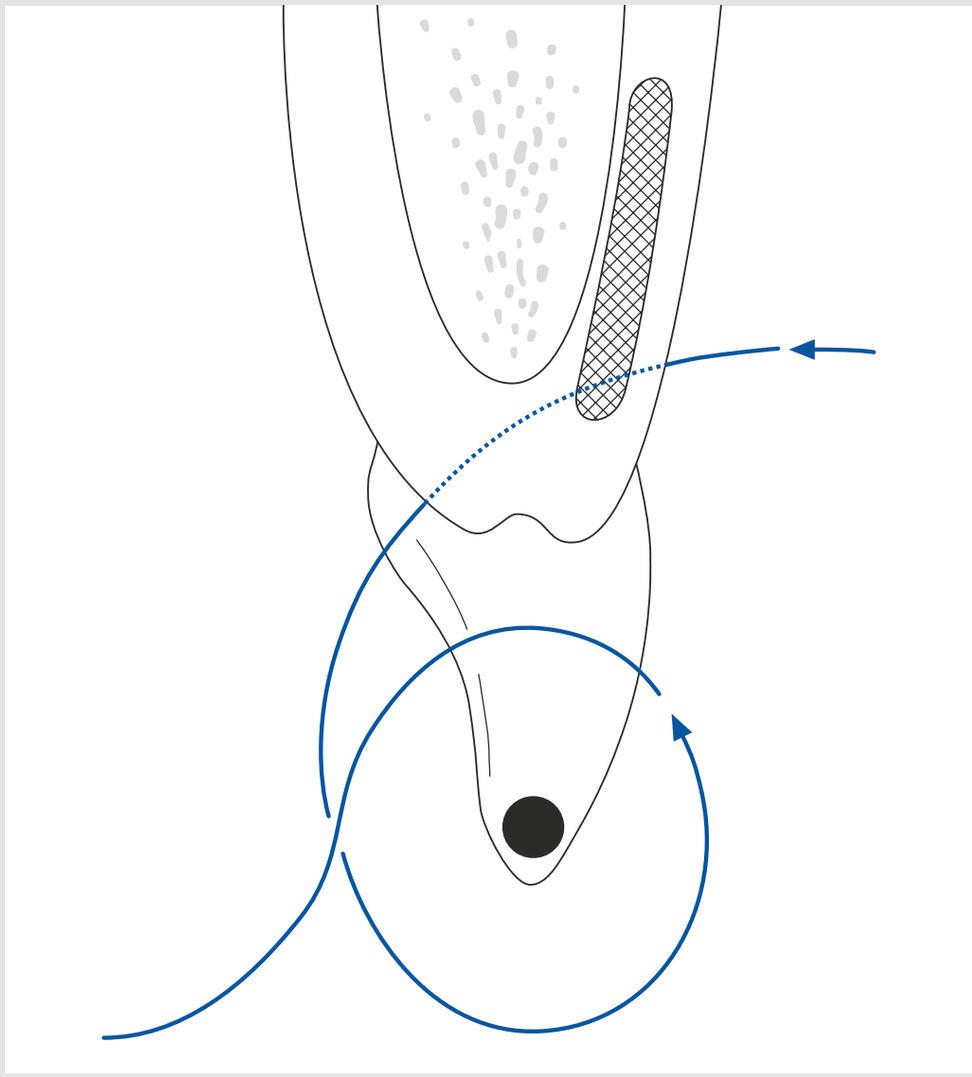


Fig 12-50 Two vertical double-crossed sutures (6-0 Seralene DS-15) are used to secure the graft. First suture: From the buccal aspect, the needle enters at the level of the mucogingival junction and engages the graft. It then passes beneath the contact point between the provisional pontic and the adjacent tooth and exits on the palatal side, slightly apical to the tip of the papilla. Next, the needle glides over the incisal edges and returns to the buccal side and then passes back-first (without engaging the tissue) under the contact point and returns to the palatal side.

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