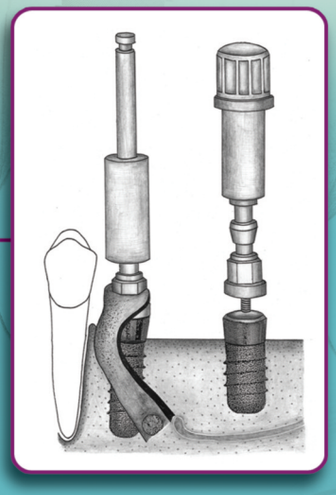
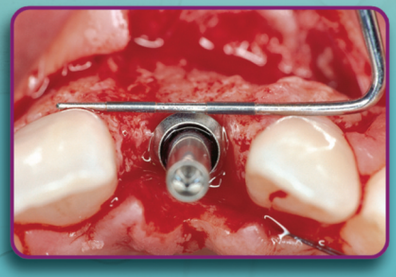
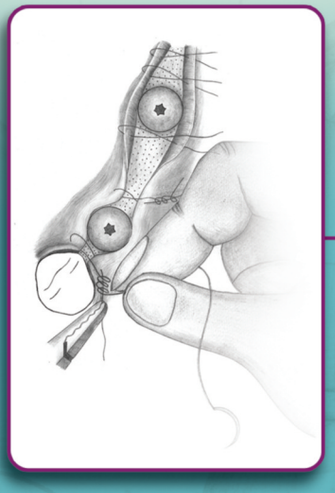
# Surgical Manual of Implant Dentistry

## Step-By-Step Procedures







Daniel Buser, DDS, Dr med dent
Jun-Young Cho, DDS
Alvin B. K. Yeo, BDS, MSc

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## Step-By-Step Procedures

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## Step-By-Step Procedures

**Daniel Buser,** DDS, Dr med dent
Professor and Chairman
Department of Oral Surgery and Stomatology
School of Dental Medicine
University of Bern
Bern, Switzerland

**Jun-Young Cho,** DDS
Associate Professor
Department of Periodontics
Baylor College of Dentistry
Texas A & M University System Health Science Center
Dallas, Texas

**Alvin B. K. Yeo,** BDS, MSc
Periodontics Unit
Department of Restorative Dentistry
National Dental Centre
Republic of Singapore

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# Preface

Based on the concept of osseointegration first described by Brånemark and Schroeder, implant dentistry has evolved tremendously over the past 15 years, and today it plays an integral role in dental rehabilitation. Though it was developed primarily to rehabilitate fully edentulous patients, since the late 1980s the treatment focus has gradually shifted to partially edentulous patients. Today, single-tooth replacement is the number one indication for implant therapy.

Implant dentistry also has benefited from the significant progress made in associated treatment protocols. Development of bone augmentation procedures allows clinicians to correct alveolar bone deficiencies, while guided bone regeneration with barrier membranes and sinus floor elevation have become standards of care to correct bone defects in other parts of the oral cavity. In addition, improved osteophilic microtextured titanium implant surfaces help to accelerate healing, significantly reducing treatment time. Together, these advances make implant therapy more predictable and more attractive to patients, and the result has been a rapid expansion of implant dentistry in daily practice and more clinicians placing dental implants.

This book is the culmination of many years' effort to standardize surgical technique in implant dentistry. It is designed for postdoctoral students and practitioners who wish to perform surgical implant procedures in daily practice with a high predictability for success and a low risk for complications. Basic surgical principles and procedures for placing implants both in standard sites and in sites with local defects are presented using detailed explanations and hand-drawn illustrations. The final chapter of the book presents 14 comprehensive clinical case reports, several documenting long-term follow-ups over a period of 10 years.

The publication of this book coincides with the production of a DVD featuring live surgery of the same surgical techniques in seven clinical cases. The surgery was recorded during master courses in implant dentistry offered by the University of Bern.

The authors wish to thank the staff of Quintessence Publishing for their excellent support during the preparation and production of this book.

chapter 1

# Basic Surgical Principles

This chapter presents the basic surgical principles related to the placement of Straumann implants in partially edentulous patients. To achieve successful osseointegration, a precise and low-trauma surgical technique is required. Surgeons must take important measures preoperatively to prevent postsurgical infection, handle surgical instruments expertly to preserve soft tissues, and carefully accomplish adequate implant site preparation without overheating the bone. Precise surgical protocol includes the following precautions:

Preoperative mouthwash with 0.1% chlorhexidine
Perioral skin disinfection with alcohol solution
Antibiotic prophylaxis 2 hours prior to surgery (eg, 2 g amoxicillin intraorally)
Low-speed drilling (between 500 and 600 rpm)
Cooling spray during drilling with chilled sterile saline
Intermittent drilling technique
Use of sharp drills

It is important to perform a surgical procedure systematically, always applying the same surgical principles.

## Fig 1-1 Smoothing the alveolar crest following flap elevation.

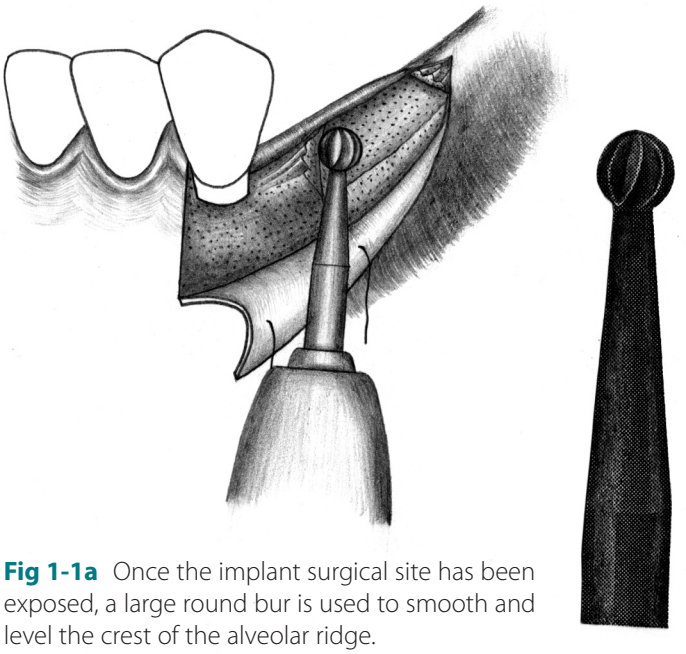


**Fig 1-1a** Once the implant surgical site has been exposed, a large round bur is used to smooth and level the crest of the alveolar ridge.

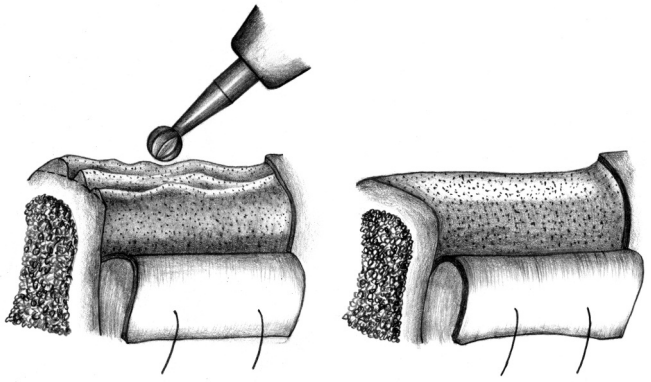


**Fig 1-1b** All sharp edges and irregularities are removed by running the round bur across the alveolar ridge.

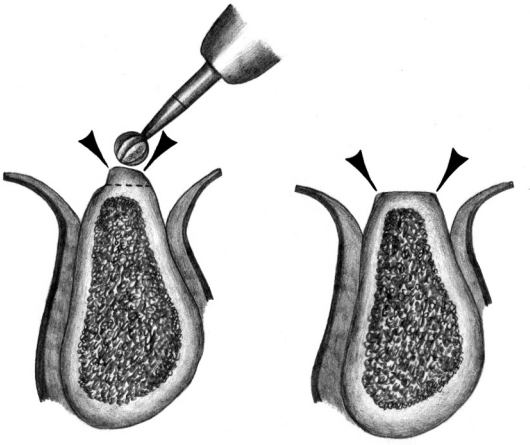


**Fig 1-1c** In this cross section, the irregular, narrow crest is smoothed to produce a flat, wide ridge, which is favorable for implant site preparation.

## **Fig 1-2** Sequence of site preparation for a standard implant.

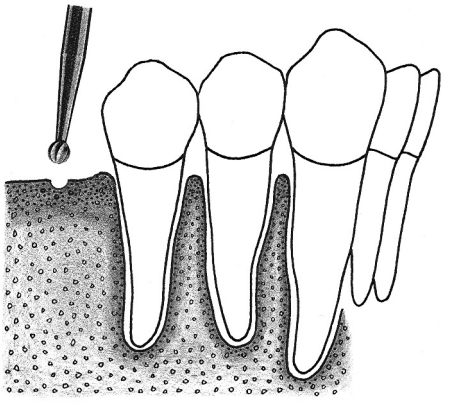


**Fig 1-2a** A no. 1 round bur is used to mark the position of the implant site.

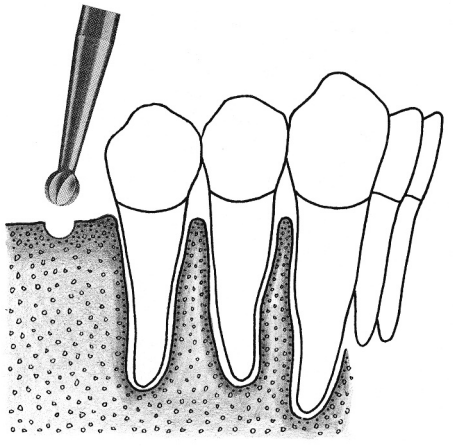


**Fig 1-2b** Access is widened with a no. 2 round bur. This step makes it possible to correctly position the next drill.

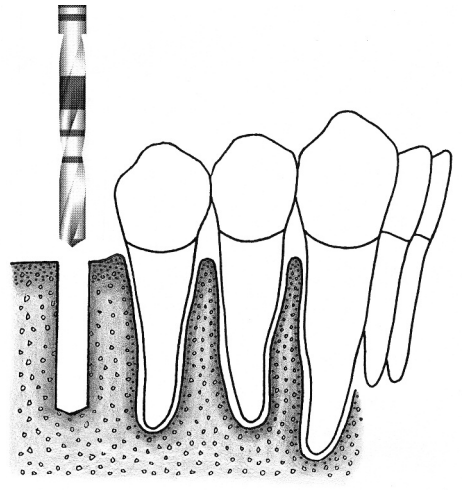


**Fig 1-2c** The initial implant site preparation is made with a 2.2-mm-diameter pilot drill.

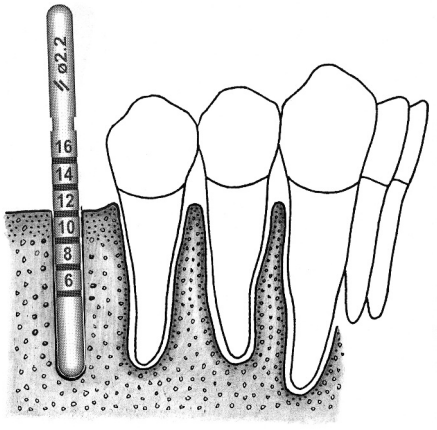



**Fig 1-2d** A 2.2-mm-diameter guide pin is inserted into the initial preparation to check its position and axis.

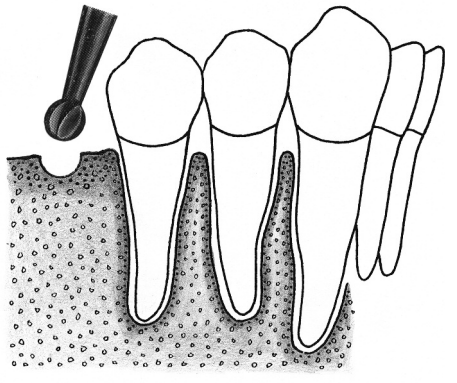


**Fig 1-2e** The crest of the osteotomy is enlarged with a no. 3 round bur.

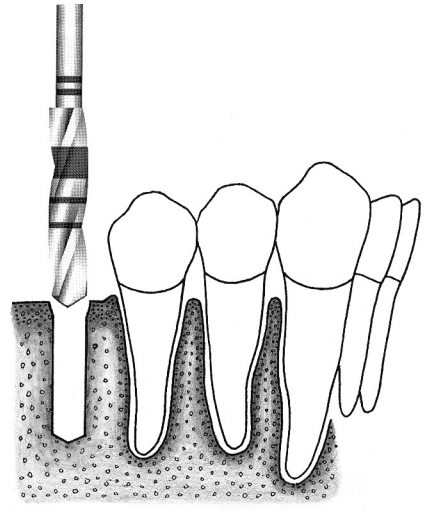


**Fig 1-2f** A 2.8-mm-diameter spiral drill is easily inserted for preparing the depth of the site.

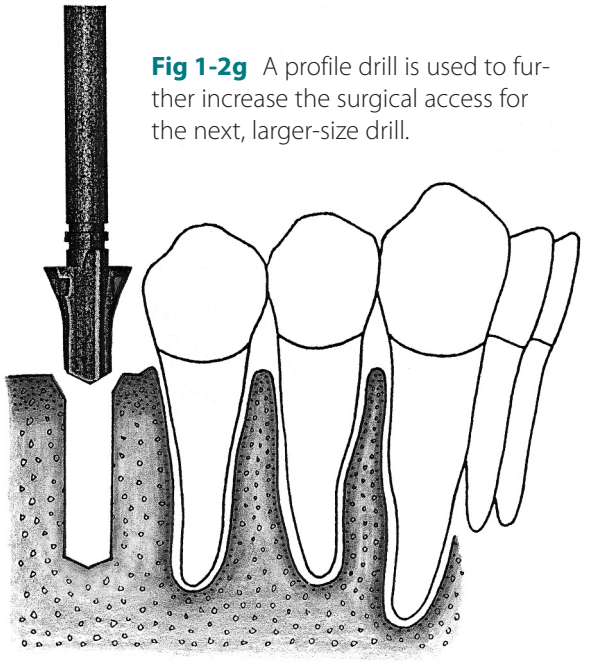


**Fig 1-2g** A profile drill is used to further increase the surgical access for the next, larger-size drill.

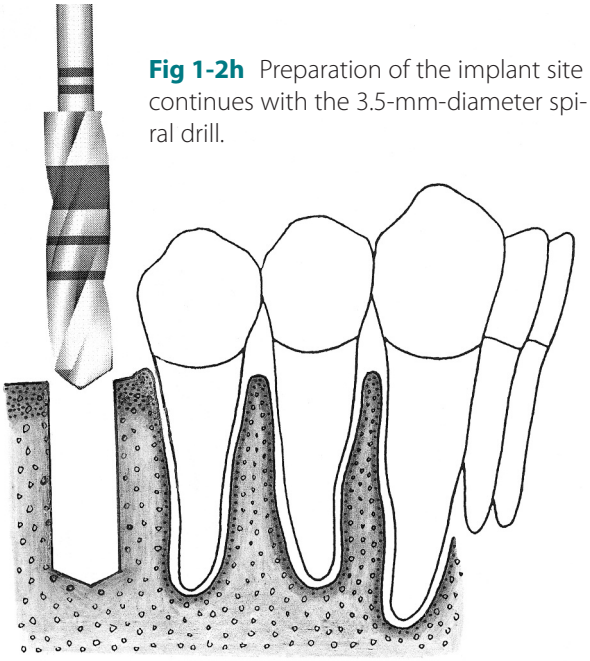


**Fig 1-2h** Preparation of the implant site continues with the 3.5-mm-diameter spiral drill.

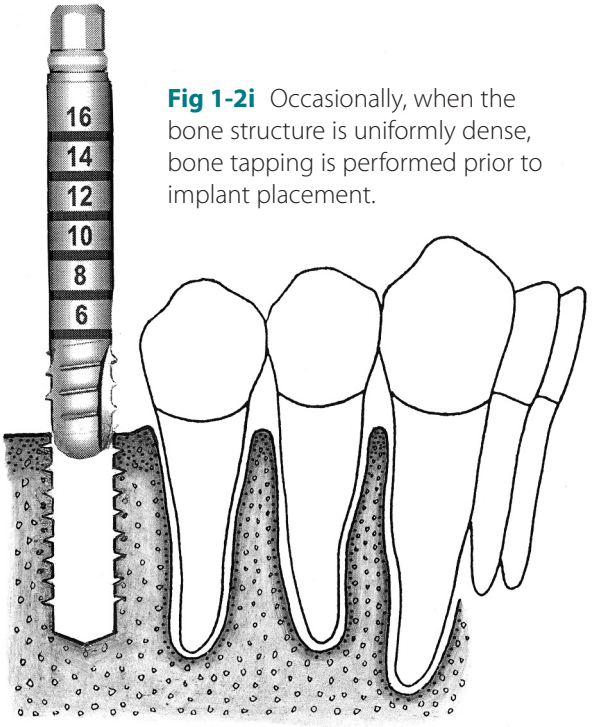



**Fig 1-2i** Occasionally, when the bone structure is uniformly dense, bone tapping is performed prior to implant placement.

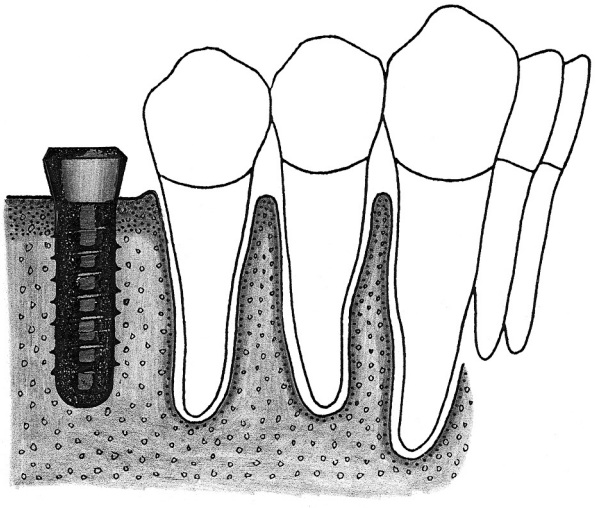


**Fig 1-2j** A standard implant is placed in the site, with the rough surface positioned at the level of the alveolar ridge crest. This allows the implant shoulder to be located at the gingival level.

## Fig 1-3 Correction of the position and axis of the implant site preparation.

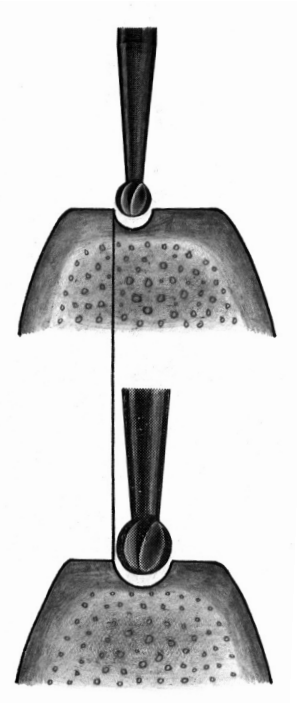
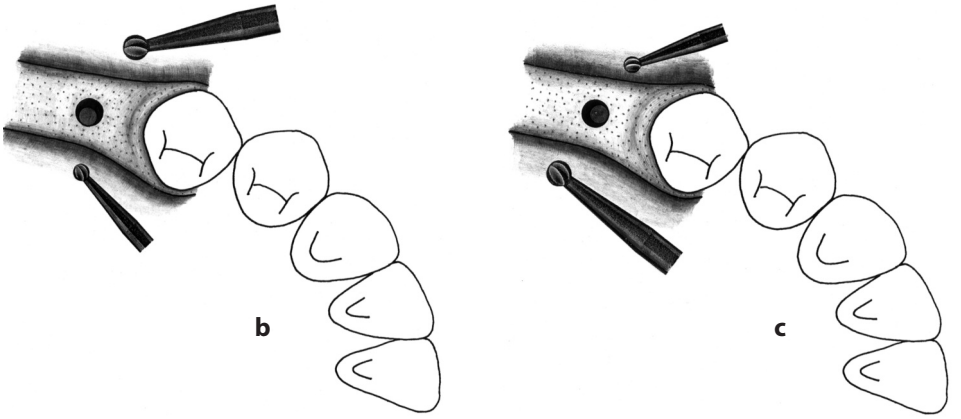


**Fig 1-3a** The preparation of the implant site begins with the use of the nos. 1 and 2 round burs to mark the position of the implant site.




**Figs 1-3b and 1-3c** Any required changes to the marking made with the first round bur can be accomplished with the no. 2 round bur, as shown in this occlusal view. These initial steps for the preparation of the implant site ensure the correct implant position orofacially and mesiodistally.

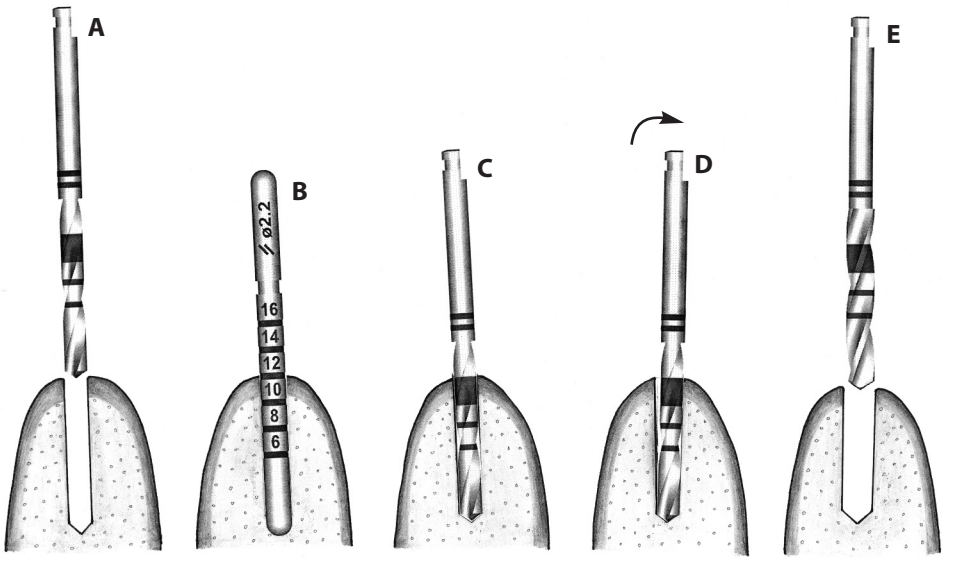



**Fig 1-3d** After the use of the first pilot drill *(A)*, a 2.2-mm-diameter guide pin is used to check the axis and depth of the implant preparation *(B)*. Any incorrect axis orientation can be adjusted with the same 2.2-mm-diameter pilot drill *(C and D)* and then followed with the 2.8-mm-diameter spiral drill *(E)*.