

Dental Implant Restoration

Principles and Procedures

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London, Berlin, Chicago, Tokyo, Barcelona, Beijing, Istanbul, Milan,
Moscow, New Delhi, Paris, Prague, São Paulo, Seoul and Warsaw

Contents

1	Introduction	1
	Basic structure of an implant assembly	5
	Theory of osseointegration	7
	Factors influencing osseointegration of implants	8
	Economics of implant dentistry	15
PART I		
2	Patient Education	19
	Patient consent	25
3	Diagnosis	27
	Age of the patient	29
	Medical history	29
	Medical history: overview	32
	Extraoral examination	32
	Intraoral examination	34
4	Implant Treatment Planning	51
	Study casts	53
	Diagnostic waxup	53
	Number of implants	55
	Position of implants	60
	Selection of implants	62
	Surgical site development	72
	Surgical guide construction	79
5	Restorative Treatment Planning	83
	Provisional restorations	85
	Comparison of cement and screws as retainers for prostheses	95
	Occlusal schemes for implant restorations	97
	Abutment types	98
6	Instruments and Components	109
	Drivers	111
	Provisional healing abutments	113
	Screws	116
7	Overdentures	119
	Mandibular overdenture	122
	Assessment of patients for overdentures	122
	Clinical procedures for overdentures	122
	Overdenture attachments	126
8	Immediate Loading of Implants	133
	Multiple implants	135
	Single implants	140

PART II

9	Single-tooth Restoration Using a Direct Technique with a Preparable Abutment	143
	Materials and components	145
	Procedure	145
10	Single-tooth Restoration Using an Indirect Technique with a Preparable Abutment	155
	Materials and components	157
	Procedure	157
11	Cemented Single-tooth Restoration Using a UCLA Abutment	169
	Materials and components	171
	Procedure	171
12	Screw-retained Single Restoration Using a Conical Abutment	183
	Material and components required	185
	Procedure	185
13	Single-unit Alternative Impression Technique Using Transfer Copings (Closed-tray Technique)	197
	Procedure	199
14	Multi-unit Restoration Using a Direct Technique with Preparable Abutments (Metal or Ceramic)	205
	Materials and components	207
	Procedure	207
15	Multi-unit Restoration Using an Indirect Technique with Preparable Abutments (Metal or Ceramic)	217
	Materials and components	219
	Procedure	219
16	Multi-unit Restoration Using UCLA Abutments	231
	Materials and components	233
	Procedure	233
17	Multi-unit Restoration Using Conical Abutments	245
	Material and components required	247
	Procedure	247
18	Multi-unit Restoration Alternative Impression Technique Using Transfer Copings (Closed-tray Technique)	259
19	Troubleshooting	267
	Screw loosening	269
	Porcelain or acrylic resin fracture of the superstructure	271
	Tilted teeth	272
	Screw fracture	272
	Speech	273
	Aesthetics	273
	Maintenance after treatment	274
	References and Index	275

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Foreword

The purpose of this book is to give the dental practitioner, undergraduate and postgraduate student a basic understanding of implant dentistry and to provide an outline of the planning that is required to produce a successful aesthetic and functional result.

The scope of the text encompasses a general overview of the theory of osseointegration, the knowledge required to diagnose a patient for implant treatment and to plan a case. This includes the important interactions with surgical colleagues and laboratories. Much of the text consists of a practical guide for simple implant restorations using techniques that are currently available and commonly used.

The bibliography provided will allow the reader to further investigate the literature and to widen his knowledge. Implant dentistry is continually evolving and I feel that this book is a good starting point and serves as a foundation for all practitioners and students.

Sincerely,
Richard Lazzara

PART



**Diagnosis and
Treatment Planning**

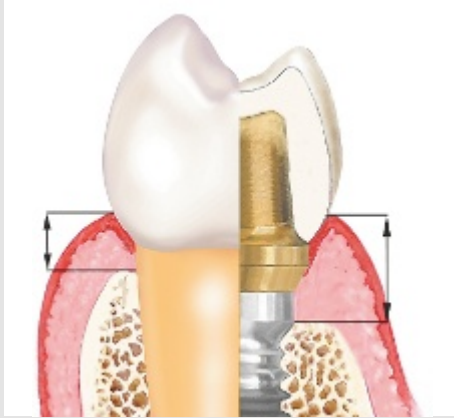


Fig 1-15 Comparison of biologic width around tooth and implant. The biologic width (shown by arrows) consists of the connective tissue and epithelial interface. This is generally greater around an external hex implant (3–4 mm) than around a healthy tooth.

The clinical implication of the biologic width is that there is typically more initial bone loss around submerged implants than around non-submerged implants. However, after the first year in function, it appears that bone levels are equally stable in both implant types.

There is usually a greater distance from the implant to the gingival margin with submerged implants than with non-submerged implants, so it is easier to create the desired emergence profile for the final restoration. Additionally, there is a greater risk in the aesthetic zone that a non-submerged implant will become visible if there is any supporting tissue loss after implant placement, as shown in Figure 1-16. This may result in the exposure of the top of the implant, which may create an aesthetic problem (Fig 1-17).

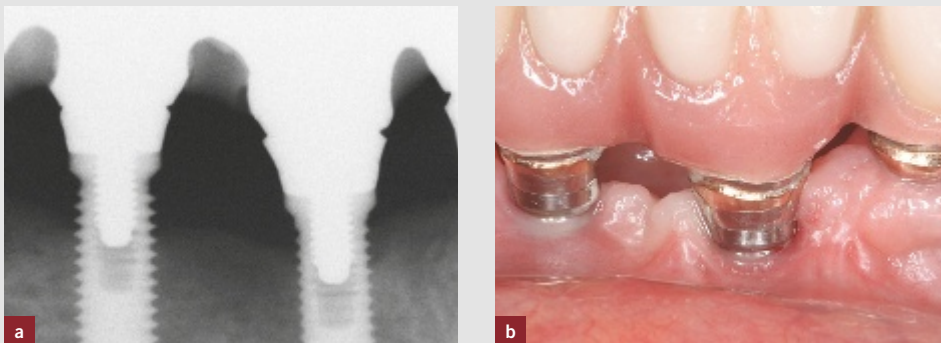


Fig 1-16 Implants where there has been loss of supporting tissue: (a) radiograph, (b) the exposure of the implant head in the mouth.



Fig 1-17 Exposure of the implant head creating an unaesthetic restoration. (a) Dotted line shows that the level of the implant placement is too superficial. Arrows show lack of interdental papilla. (b) The abutment screwed onto the implant, showing implant head and abutment collar exposed above the soft tissue. (c) The crown fabricated for this implant required a ridge lap to mask the exposed implant head and abutment collar. (d) The completed restoration showing the poor aesthetic outcome. The use of pink porcelain was not sufficient to compensate for the implant position and the lack of interdental papillae.

Platform switching

A recent modification of the implant assembly has been advocated to prevent the initial crestal bone loss that is seen at the implant–abutment interface when the implant is placed at or below the bone crest. By placing an abutment of smaller diameter onto the implant platform, the implant–abutment interface is moved inward from the implant shoulder (Fig 1-18). Hence, the microgap-induced inflammation, described above under “Biologic width,” is further away from the crestal bone. An example of platform switching is shown radiographically in Figure 1-19. This so-called platform switching may better maintain bone and soft tissue levels around the implant. Platform switching may be particularly beneficial in the aesthetic zone where soft tissue preservation is critical.



Fig 5-11 Construction of a provisional cement-retained, multiple-unit restoration on conical abutments, using a tapered titanium coping, which is screwed onto the abutments. (Courtesy of Dr. P-O Ostman)

Comparison of cement and screws as retainers for prostheses

Both cement-retained and screw-retained prostheses have been validated in clinical studies, and each type of retention has particular advantages and disadvantages (Table 5-1). Historically, screw-retained prostheses were widely used on dental implants because the restorations could be retrieved for evaluation of the underlying implants and repair of any possible complications. Cemented restorations are now widely used as they allow a more aesthetic restoration to be created. While they are not as readily retrieved as a screw-retained prosthesis, cementing restorations with provisional cement allows a degree of retrievability. There is some evidence that cement-retained fixed prostheses have fewer prosthodontic complications after delivery.

It is generally simpler to correct a misaligned implant with a cemented restoration. In the case of screw-retained restorations, if the implant is misaligned, the screw access hole may be in a variety of locations (Fig 5-12). A misaligned access hole may perforate the labial surface of the restoration or create an abnormally shaped cingulum area (Fig 5-13). This may lead to aesthetic or phonetic problems. Similarly, on a posterior tooth, the access hole may obliterate much of the occlusal anatomy (Fig 5-13). With a screw-retained prosthesis, once the retaining screw has been tightened, the access hole is filled with a resin material. During function, this material wears and stains, and periodically needs replacement. The screw access hole may represent 50% or more of the occlusal surface of a posterior tooth, so the correct occlusal contacts must be built into the resin restoration chairside.

Table 5-1 Features of cemented and screw-retained restorations.

	Cement-retained	Screw-retained
Retrievable	not easily	yes
Aesthetics	excellent	variable
Correction of misaligned implant	usually	sometimes
Ease of insertion	conventional techniques	difficult in posterior areas
Retention at minimal occlusal height	marginal	excellent
Passive fit	yes	questionable
Maintenance	minimal	moderate

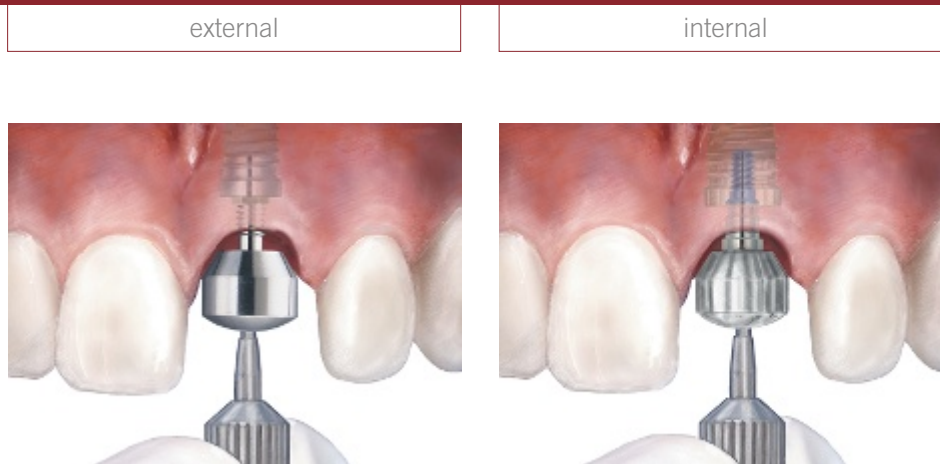


Fig 9-2 Healing abutment removed using hexagonal driver.

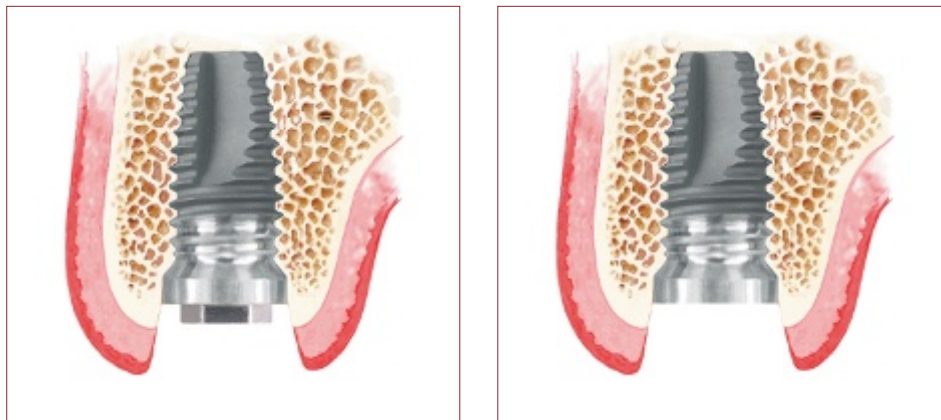


Fig 9-3 Implant with healing abutment removed.

The entire implant platform should be visible. If there is any soft tissue over the surface (Fig 9-4), this should be carefully removed with a plastic- or gold-tipped scaler to avoid damaging the implant surface.



Fig 9-4 Ensure that there is no soft tissue obscuring the implant platform.

external

internal

To ascertain the height of the collar that is required for the abutment, measure the height of the soft tissue using either a periodontal probe (Fig 9-5) or a tissue measuring post.

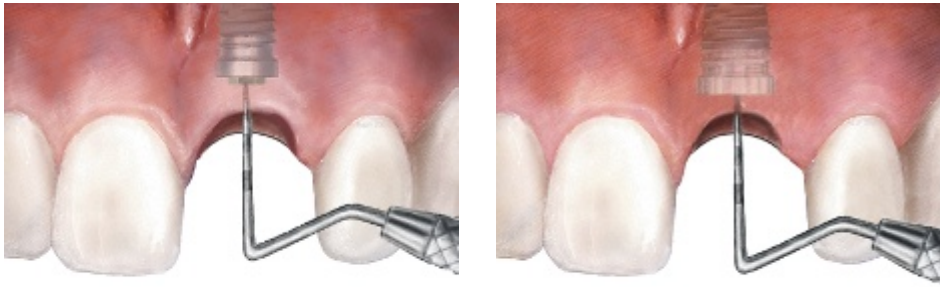


Fig 9-5 Use of a periodontal probe to measure the height of tissue above the implant.

Select the abutment height that best fits the tooth that is being replaced. As a guide, the collar of the abutment should lie approximately 1 mm below the gingival margin. Place the abutment over the head of the implant (Fig 9-6). Rotate the abutment slightly to ensure the hexagon on the underside of the abutment fully engages the hexagon of the implant.

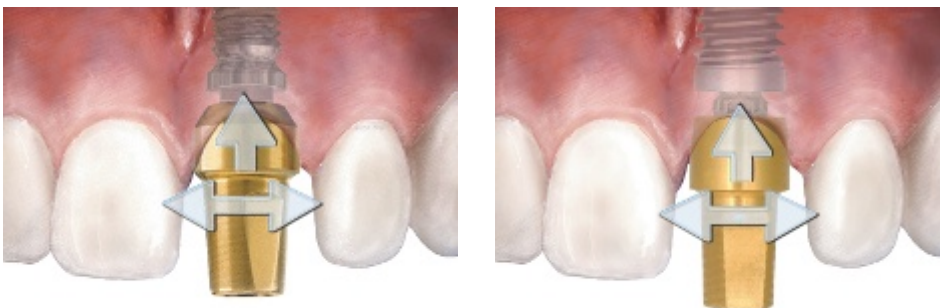


Fig 9-6 Placement of abutment to engage the hex of the implant. When seated, the prepared finish line on the abutment should be about 1 mm below the soft tissue at the highest point (usually interproximally).

Take the hexed try-in screw and use the hex driver to initially tighten the screw and secure the abutment to the implant (Fig 9-7).