Dental Implant Restoration

Principles and Procedures

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PART II

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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 I

Diagnosis and Treatment Planning

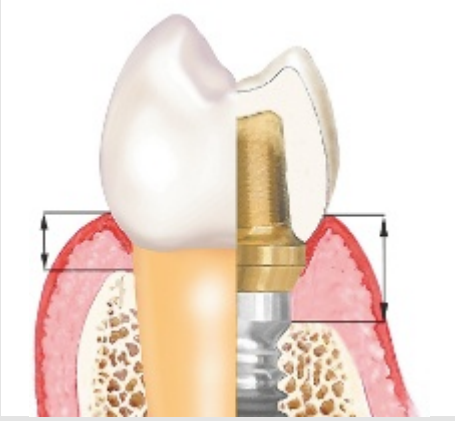

Fig 1-15 Comparison of biologic width around tooth and implant. The biologic width (shown by arrows) consists of the connective tissue and epithelial interface. This is generally greater around an external hex implant (3–4 mm) than around a healthy tooth.

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).

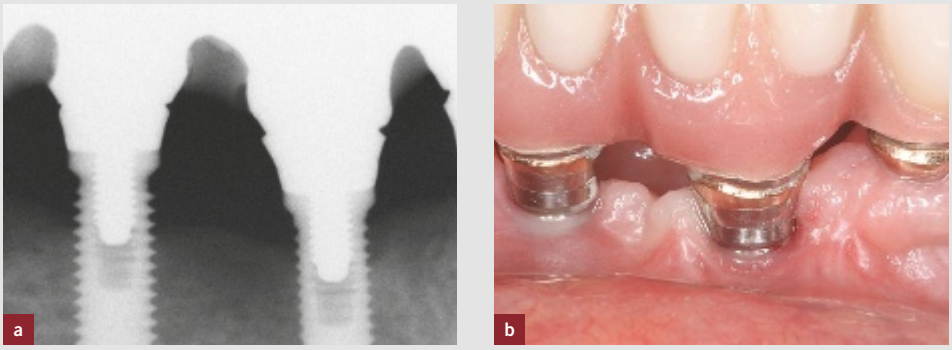

Fig 1-16 Implants where there has been loss of supporting tissue: (a) radiograph, (b) the exposure of the implant head in the mouth.

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

external | internal

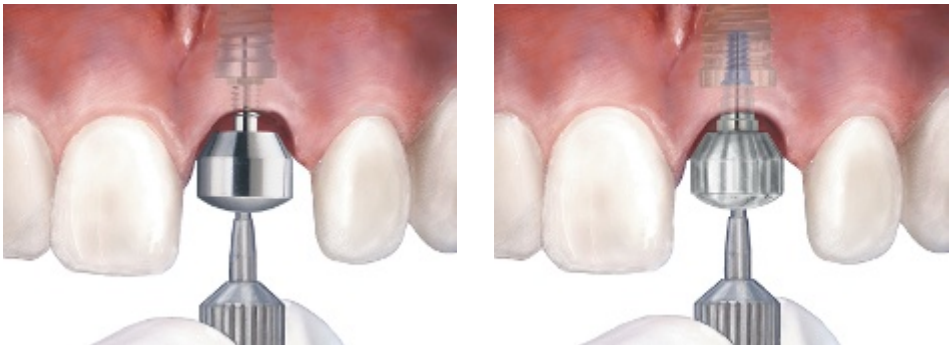

Fig 9-2 Healing abutment removed using hexagonal driver.

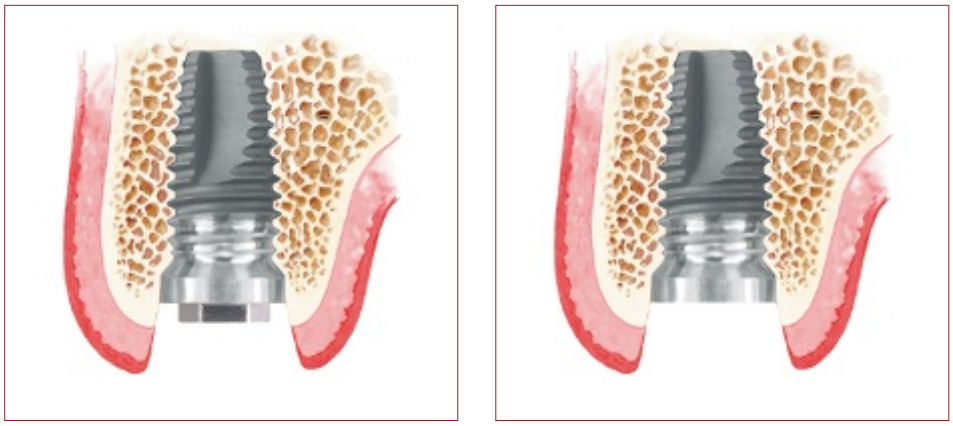

Fig 9-3 Implant with healing abutment removed.

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.

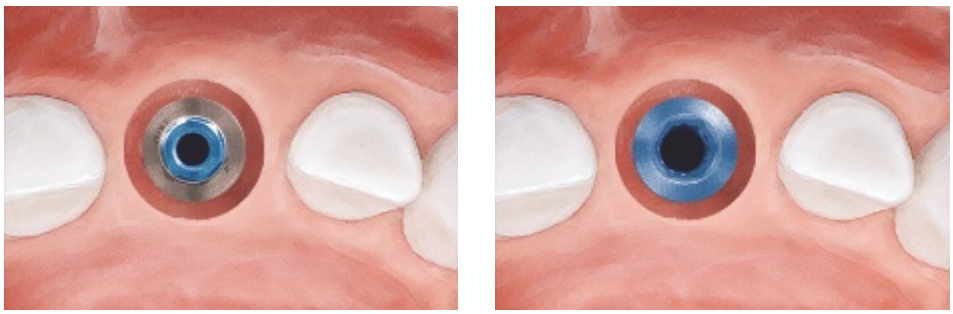

Fig 9-4 Ensure that there is no soft tissue obscuring the implant platform.

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.

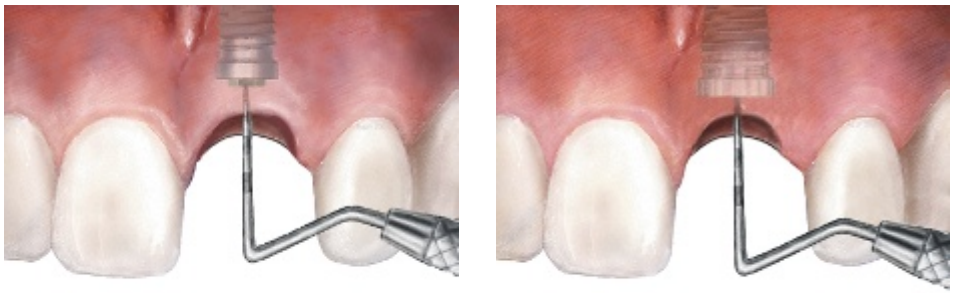

Fig 9-5 Use of a periodontal probe to measure the height of tissue above the implant.

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).