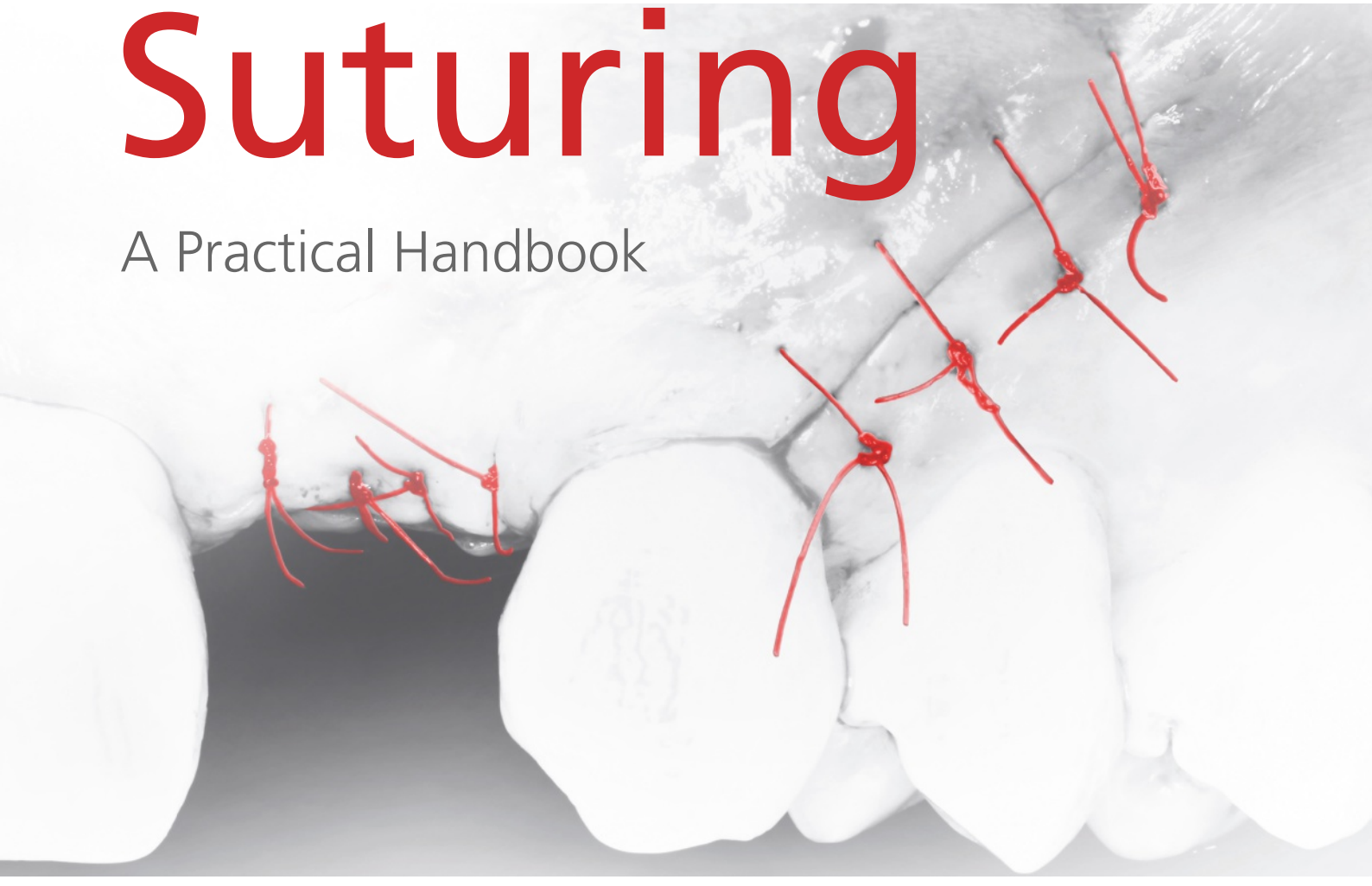
Stephan Beuer
Martin Stangl
Edward P. Allen

Basic Dental Suturing

A Practical Handbook



QUINTESSENCE PUBLISHING

Basic Dental Suturing

A Practical Handbook

QUINTESSENCE PUBLISHING

Berlin | Chicago | Tokyo
Barcelona | London | Milan | Mexico City | Paris | Prague | Seoul | Warsaw
Beijing | Istanbul | Sao Paulo | Zagreb

One book, one tree: In support of reforestation worldwide and to address the climate crisis, for every book sold Quintessence Publishing will plant a tree (https://onetreeplanted.org/).

Numerous videos are included in this book that illustrate the content and enrich the reading experience. These can easily be played via QR code using a smartphone or tablet.

Alternatively, the videos can also be accessed via this link: https://video.qvnet.de/b24331/

Title of original issue:
Der rote Faden
Dentalchirurgische Nahttechniken
Copyright © 2019 teamwork media GmbH, Germany

A CIP record for this book is available from the British Library.
ISBN: 978-1-78698-123-3

QUINTESSENCE PUBLISHING DEUTSCHLAND

Quintessenz Verlags-GmbH
Ifenpfad 2–4
12107 Berlin
Germany
www.quintessence-publishing.com

Quintessence Publishing Co Ltd
Grafton Road, New Malden
Surrey KT3 3AB
United Kingdom
www.quintessence-publishing.com

Editing: Quintessence Publishing Co, Inc, Batavia, IL, USA
Layout, Production and Reproduction: Quintessenz Verlags-GmbH, Berlin, Germany

Printed and bound in Croatia by Grafički zavod Hrvatske d.o.o.

For Josephina and Korbinian, Felix, and Tim

Foreword

Implantology and periodontal plastic surgery have become an integral part of reconstructive dentistry. The purely functional indication of implantology for the replacement of natural tooth roots, for static abutment augmentation, or for fixed tooth restoration has long since changed to esthetic implant reconstruction. In addition to the imitation of white tooth structure, the reconstruction of lost hard and soft tissue is a basic prerequisite for this. The techniques for hard and soft tissue augmentation in particular are very technique sensitive and require a great deal of practice and skill on the part of the surgeon. Especially in hard tissue augmentation, primary wound closure and primary wound healing are of extreme importance because any wound dehiscence will lead to postoperative problems, resulting in complications or failure. Gentle and atraumatic intraoperative treatment of the soft tissues is crucial for irritation-free primary wound healing. The correct incision and flap design with well-perfused flaps, the precise preparation of the flaps at different thicknesses, and tension-free wound closure are all important. Correct suturing techniques are required to ensure this. Suture materials and needle selection also play an important role here. Appropriate wound closure thus contributes massively to the success of the surgical procedure and also represents a high proportion of the time required for the procedure. The saying "many sutures are the death of wounds" dates back to times when relatively thick needle-thread combinations were used to close wounds. With the advent of microsurgery in periodontal plastic surgery and subsequently in implantology, we can now fix and adapt the wound margins very carefully and securely with thin needle-suture combinations in a relatively atraumatic manner.

Unfortunately, the topic of suturing is given far too little attention in many textbooks, and little is said about safe wound closure, especially in the area of hard tissue augmentation. I am therefore particularly pleased that these two authors have addressed this very important topic in this book and presented it so clearly. This book can be regarded as a supplement to all implantology and periodontology books.

In addition, this text is intended to give students and young professionals a good overview of the various suture techniques that can be used in oral surgery. The systematic presentation of the techniques with detailed demonstrations on acrylic and animal models makes it very easy to understand and practice these techniques, enabling beginners to not only tie single button sutures but also use different suture techniques correctly in their daily work with patients.

I hope both that readers enjoy this book and learn the different suture techniques for use with their patients and that the authors receive positive feedback from their audience.

In long-standing friendship,
Michael Stimmelmayr

Preface

No matter how well a surgical procedure is performed, its outcome is ultimately dependent upon precise wound closure with the correct suturing material and technique. As oral surgical procedures have evolved from macroscopic techniques to microsurgical approaches, suturing techniques, needle sizes, and thread materials have also changed. As a result, selecting the appropriate suture material and method can be confusing for experienced and novice surgeons alike.

This book is a concise resource for understanding the myriad suturing options available to dentists today. The authors have made every effort to include recently developed suturing concepts pertinent to both conventional oral surgery and oral microsurgery. Step-by-step drawings, with accompanying photographs of the techniques performed on an animal model, can be used as easy-to-follow exercises for practice at home. Once the suturing techniques are mastered on a model, they can be readily applied with confidence in a clinical setting.

The final chapter discusses the management of complications encountered during and after surgery. No matter your experience level, you can expect occasional complications, and this section prepares you for those occasions.

Although this book will help prepare you to achieve exceptional surgical outcomes, it is only a guide and a compass. As Sir William Osler once said, "to study medicine without books is to sail an uncharted sea, while to study medicine only from books is not to go to sea at all."

Edward P. Allen

Authors

Dr Stephan Beuer, MSc, studied dentistry in Regensburg from 1997 to 2003. After 2 years of preparation in a general dental practice, he completed his specialist training as an oral surgeon in an oral and maxillofacial surgery practice. In 2006 he completed his doctorate under Prof Dr Michael Christgau. Dr Beuer earned his master of science (MSc) degree in orthodontics at the end of 2009. At the beginning of 2010, he opened the Münchnerau practice clinic in Landshut together with Dr Christian A. Kaes. His main areas of treatment are hard and soft tissue augmentation, periodontal surgery, and implantology. He works exclusively as a surgeon. Dr Beuer is also a speaker and author as well as a member of the "New Group" and various other scientific societies.

Dr Martin Stangl studied dentistry at the University of Regensburg, Germany, from 2001 to 2007. In 2009, he completed his doctorate under Prof Dr Gottfried Schmalz in dental conservation. Since the beginning of his preparatory period, Dr Stangl has been working with Prof Dr Michael Stimmelmayr in Cham, with whom he founded a joint practice in 2011. In addition to surgical procedures, his main areas of practice are prosthetic and reconstructive dentistry.

Edward P. Allen, DDS, PhD has served as president of the American Academy of Esthetic Dentistry, the American Academy of Restorative Dentistry, and the American Academy of Periodontology Foundation. He is the recipient of the Master Clinician Award from the American Academy of Periodontology, the President's Award for Excellence in Dental Education from the American Academy of Esthetic Dentistry, and the Saul Schluger Award for Excellence in Diagnosis and Treatment Planning. In 2019, he was honored with the AAP Gold Medal Award, the highest award bestowed by the Academy. Currently, he serves on the editorial boards of the Journal of Esthetic and Restorative Dentistry, the Journal of Periodontology, and the International Journal of Periodontics and Restorative Dentistry. Dr Allen is founder of the Center for Advanced Dental Education in Dallas, an educational facility where he teaches surgical technique courses. He has over 100 publications and has presented numerous lectures and surgical demonstrations worldwide.

Table of Contents

1. Introduction

"I'll be done in a minute. I'll just do a quick sew up!"

Unfortunately, this sentence is heard far too often. Appropriate wound closure complements a surgical procedure as a final step and thus represents a *sine qua non*.

Every complex procedure, especially when it includes augmentation, is followed by a no less complex and time-consuming wound closure; otherwise there is no certainty of a good and predictable result. Sustainability in particular plays a major role. An initial wound closure that loosens due to excessive tension or due to the shape of the graft, resulting in wound dehiscence, is extremely unpleasant for both the patient and the surgeon. It is not uncommon for such a complication to be associated with the loss of the graft and ultimate failure.

Sensitive handling of hard and soft tissue as well as primary and tension-free wound closure are absolutely essential for tissue healing. It is therefore quite clear that the preparation of the flap and the tension-free wound closure need to be given as much time and care as the rest of the procedure. In short, wound closure is the most important part of every surgical procedure!

This book is intended to introduce the reader step by step to high-quality suturing in dental surgery. Particular emphasis is placed on teaching the basic suturing techniques. For more specialized suturing techniques, the reader is referred to the appropriate periodontal surgery books. This book is intended to serve the practitioner as an uncomplicated handbook that can be consulted at any time.

The individual chapters are structured in such a way that first an informational box provides indications and other basic information for a particular suture. Subsequently, the suture techniques are illustrated on acrylic and animal (pig ear) models.

2. Suture Instruments

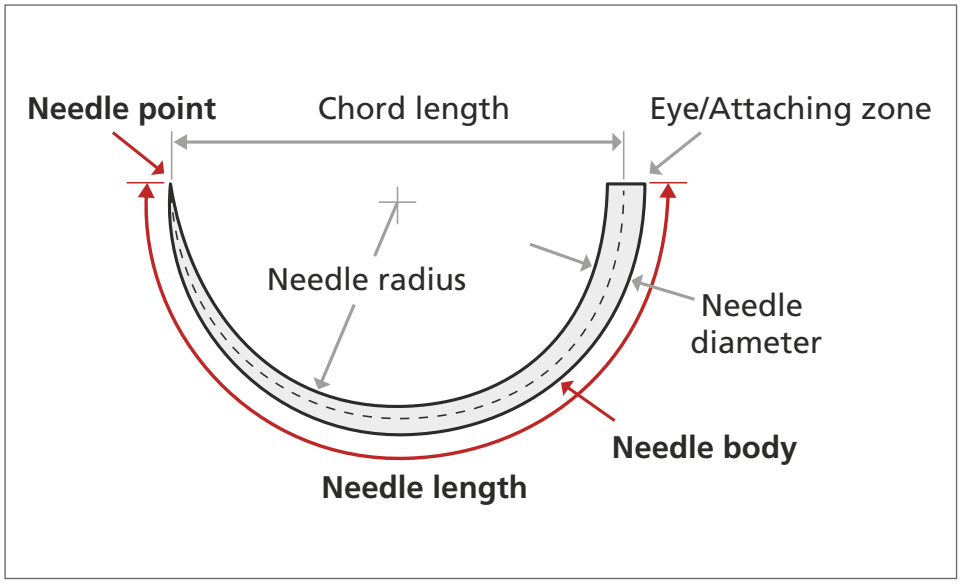
2.1 Needle

Each suture material must be paired with a suitable needle. There is a wide range of needles to choose from in the field of dental surgery. Today's manufacturers ensure that needles meet the requirements in terms of sharpness, good piercing ability, elasticity, and bending strength, as well as sterility.

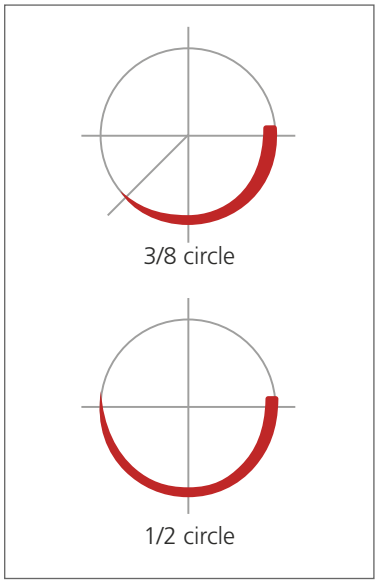
When selecting needles, some parameters have to be considered. Let us first look at the basic structure of a needle (Fig 1). Of clinical importance are, above all, the shape of the bend, the needle tip, the needle eye, and the needle code.

2.1.1 Bend

The bend is given as a fraction of a full circle. In dental surgery, 3/8- and 1/2-circle needles with an arc length between 9 and 18 mm are most often used (Fig 2). Straight needle shapes are only used extremely rarely and are suitable for interdental sutures, for example.

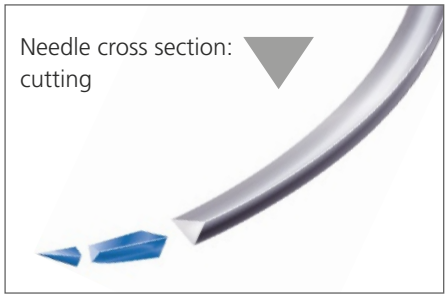


1 Needle structure.

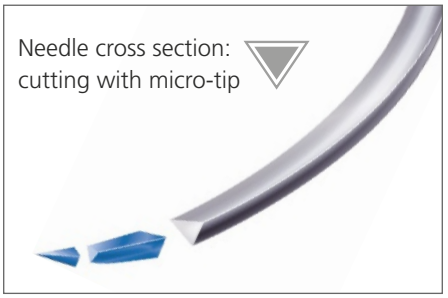


Source: Chirurgischer Wundverschluss im Dentalbereich, B. Braun Melsungen AG

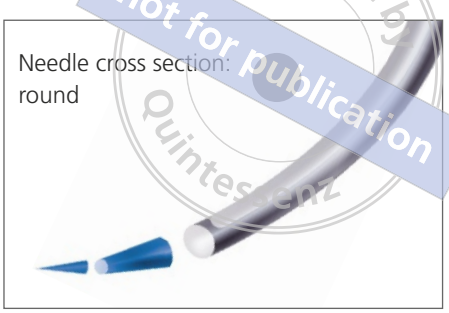
2 The most popular needle shapes in oral surgery are 3/8- and 1/2-circle.



3 The triangular, externally cutting needle body is indicated for suturing tough tissue. The three cutting edges extend the entire length of the needle and allow optimal piercing ability with a reliable, cosmetic result.



4 The cutting micro-tip of this slim precision needle is hand sharpened and allows very good tissue penetration, very fine sutures in attached tissue, and very good cosmetic results with minimal trauma.



Source: Chirurgischer Wundverschlussim Dentalbereich, B. Braun Melsungen AG

5 The round body of the needle tapers to a fine, sharp needle point. Round-bodied needles only pierce the tissue, they do not cut. Therefore, they are well suited for sutures in soft tissue.

2.1.2 Needle tip

The needle tip extends from the sharpened end to the point at which the needle reaches its full cross section. We distinguish:

- The triangular cutting needle (Fig 3)
- The micro-tip cutting needle (Fig 4)
- The round needle (Fig 5)

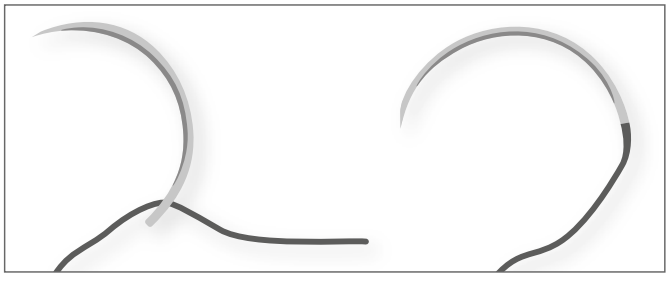
Note that although there are various other needle shapes and tips, they do not play a prominent role in dental surgery.

The choice of needle should be based on the indication because the piercing behavior is very different in connective tissue than in keratinized gingiva.

2.1.3 Eye/Attaching zone (connection between needle and thread)

The type of connection between the needle and thread is important. In this context, the terms *traumatic* and *atraumatic* are often used.

In traumatic suturing, the needle and thread consist of two parts connected by the eye of the needle. The eye of the needle can be either closed (as with sewing needles) or open to allow the thread to be hooked in. A crucial problem is the incongruent size relationship between the needle and thread, which causes trauma when penetrating the tissue (hence the term *traumatic*). In addition, bacteria can be carried deep into the niches between the needle and thread. This can impair wound healing. Fortunately, traumatic suture materials are hardly ever used anymore.



Source: teamwork media GmbH

6 Difference between traumatic (left) and atraumatic (right) needles.

Today, the atraumatic suture is the method of choice and has largely replaced the traumatic suture in oral surgery. A swaged needle has no eye, but rather the thread is attached to a hollow end. The connection between the needle and the thread appears to be seamless because one end of the thread is attached to the distal end of the needle by a cylindrical part (hollow-cylinder system) or a throat (flange system). Unfortunately, it is still very difficult to achieve the ideal 1:1 ratio between the needle and thread all the time.

2.1.4 Needle code

The needle code provides information on the size and condition of the needle and consists of a letter-number combination (Fig 7). The first letter indicates the needle anatomy; the second letter marks the shape of the needle body. If a third or fourth letter follows, they refer to special features of the needle. The number after the letters indicates the needle length in stretched form (arc length) in millimeters (mm). Figure 8 shows a package with the needle code DS12.

Picture: Aesculap AG

8 Example of a monofilament, nonabsorbable thread of strength 6/0 (D = 3/8-circle, S = cutting needle, 12 = arc length in mm). For some suture suppliers, the needle designations do not allow direct reference to the needle.

Important

- In dental surgery, mainly 3/8- and 1/2-circle needle shapes are used.
- Only atraumatic needles should be used.
- The needle code includes needle curvature, body, tip, and length.

Needle curvature	Needle body	Needle tip	Needle length	Additional information
S 1/8-circle	**R round body**	**T trocar tip**	**The numbers indicate the distance from needle tip to end in mm, measured at the outer curvature of the needle.**	s strong needle body ss very strong needle body
V 1/4-circle	**S cutting**	N blunt tip		
D 3/8-circle	L lancet	S cutting tip/inside		
H 1/2-circle	SP spatula	C short cutting tip		
F 5/8-circle		**MP micro-tip/precision**		
G straight		m micro-needle		
P progressive				

Source: Chirurgischer Wundverschluss im Dentalbereich, B. Braun Melsungen AG

7 The needle code: The areas marked in dark gray reflect the dental priorities. An example of this can be seen in Figure 8 (DS12).

2.2 Thread

In addition to the needle, the thread is an essential component of the suture material. Surgical suture material can be classified according to the criteria of absorbability, thread structure, and thread strength.

2.2.1 Absorbability

The most important distinction is between absorbable and nonabsorbable sutures (Fig 9). Absorbability is the calculated and intended dissolvability of a suture in living human or animal tissue.

In the case of absorbable filaments, polymers of glycolic or lactic acid and polydioxanones are mainly used today. Their degradation takes place via hydrolysis, with the end products being CO_2 and H_2O. This avoids the occurrence of superfluous inflammatory reactions. The data on the absorption time should be regarded as approximate because many factors (eg, mechanical forces, thread strength, tissue type, local infections, general condition of the patient) cannot be specified exactly and may vary considerably.

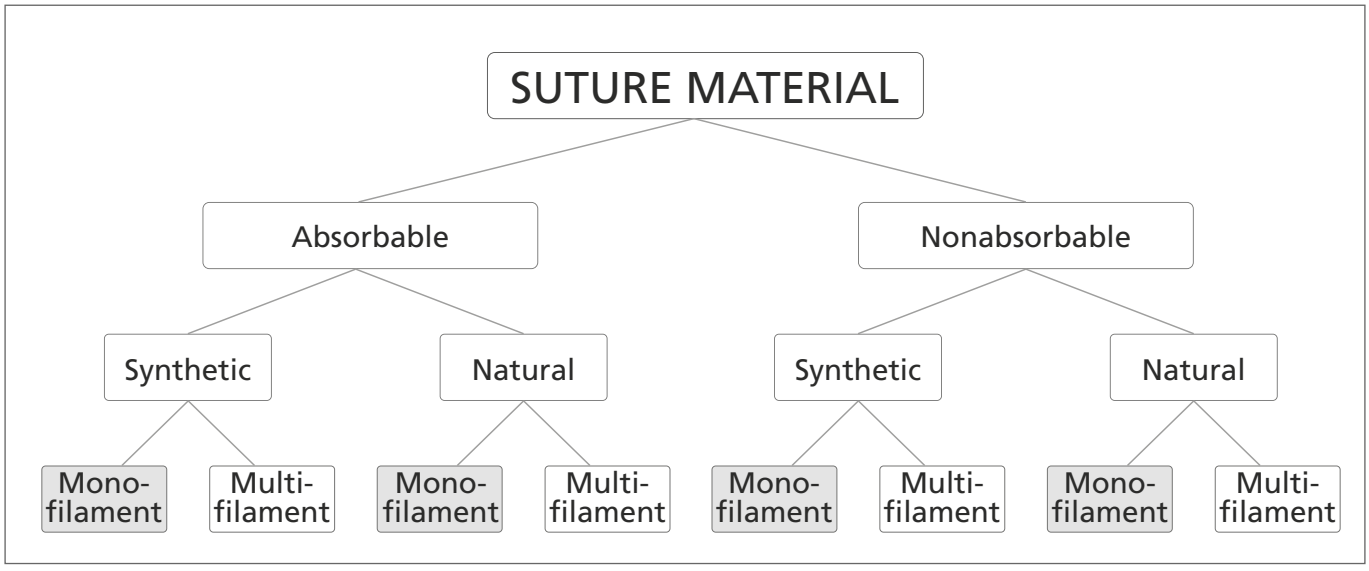
Indications for absorbable sutures range from suturing with multilayer techniques to use in very young, apprehensive patients and/or patients with infectious disease or multiple morbidities.

Nonabsorbable suture material is used for all other indications. The tension resistance should be maintained for at least 60 days. Synthetic materials such as polyamide polymers (nylon), polyester fibers made of polyethylene terephthalate, and propylene polymers and polyvinyl polymers are mainly used. These are synthetic polymers whose quality can be kept consistent.

Silk is another nonabsorbable natural multifilament suture material but should no longer be used in dental surgery due to its capillarity and the associated bacterial load on the tissue. In the case of monofilament sutures, the inner space is completely closed, and thus any form of capillarity is excluded. This property allows the threads to be left in place for a longer period of time.

As a general rule, it is better to err toward leaving sutures in place for too long rather than not long enough in the case of complex surgical procedures. Because these materials do not react with the environment, they can be removed without complications even after being in place for weeks.

Catgut—a natural suture material made from the intestinal tissue of sheep or cattle—is no longer used because of the risk of prion transmission, among other reasons. Only synthetically produced materials are used today. Synthetic suture materials



Source: Beuer/Stangl

9 **Breakdown of suture materials according to absorbability, origin, and thread structure.**

offer consistent quality, whereas natural suture materials exhibit variation in their physical properties.

In principle, it is important to remove nonabsorbable suture material; otherwise, a foreign body reaction with connective tissue entrapment of the suture can occur. In the context of wound healing, this can have a detrimental effect after removal of the suture.

2.2.2 Thread structure

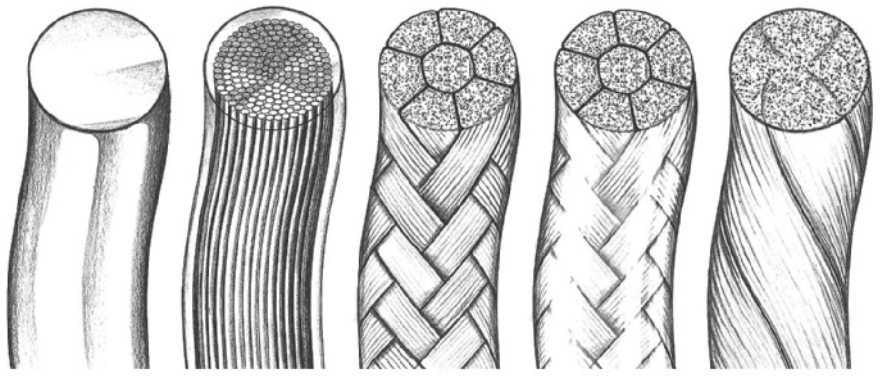
Another important feature of suture materials is the structure of the filaments. Monofilament materials can be differentiated from pseudomonofilament and multifilament materials (Fig 10).

Monofilament sutures consist of one piece and are the most popular suture material in dental surgery. They have the best properties for gliding through the tissue, and the smooth, closed surface prevents any capillarity, which means they cannot absorb and pass on water in the filaments. On the negative side, monofilament filaments have a high elastic memory. That is, the force restoring it to its original position is high, and the knot can open more easily. This elastic memory is the highest in nylon. In addition, monofilament threads are sensitive to external damage, for example, when gripping the thread with instruments. Nonabsorbable expanded polytetrafluoroethylene (ePTFE) monofilament sutures have the best lubricity.

Multifilament suture material consists of a large number of individual threads or filaments of identical thickness that can be braided or twisted. This increases physical properties such as strength, elasticity, and flexibility and thus significantly improves the knot strength.

On the other hand, multifilament threads have a rough surface, making it more difficult for them to pass through the tissue, which has a negative effect on the friction behavior. Likewise, multifilament sutures have greater capillarity, which favors the adhesion of bacteria. A classic example of a natural multifilament suture is silk, which should no longer be used in oral surgery. The lubricity of silk is significantly worse compared to monofilament suture materials.

Pseudomonofilament suture materials are coated or sheathed multifilament materials. The coating smooths the rough surface, facilitating passage through tissue and reducing capillarity. Thanks to this measure, the advantages of monofilament suture materials are obtained while the disadvantages are reduced, ie, the knot fit is tighter, and the threads are less wiry and stiff. Dyeing the suture material allows easier identification of the suture in the wound area.



Source: Chirurgischer Wundverschluss im Dentalbereich, B. Braun Melsungen AG

10 Thread structure as a classification criterion: monofilament versus multifilament.

2.2.3 Thread strength

The specific properties of the thread are determined not only by the material and the thread structure but also by its strength and cross section (Fig 11). The strength classification is regulated, and there are basically two different systems for designating strength.

The first is the metric strength designation of the European Pharmacopoeia (EP). The diameter designation is metric, and the filament diameter is given in increments of 0.1 mm. On the other hand, there is the classification according to the United States Pharmacopoeia (USP). In this classification, the thread strength designation is arbitrary and not directly related to the thread diameter.

Although classification according to EP would be more rational, the USP classification is predominantly used today. In dental surgery, suture material of strength 4/0 to 7/0 is recommended for surgical procedures.

The rule is: As thin as necessary and as thick as possible. As thin as necessary means that the tissue must not be traumatized or the blood supply cut off. As thick as possible means that thicker thread makes it easier for the practitioner to place and remove the sutures.

Important

- Suture materials are classified into absorbable versus non-absorbable and natural versus synthetic materials.
- The thread structure, the thread thickness, and the material determine the tensile strength and knotting properties.
- The smaller the thread diameter, the lower the tissue damage but also the lower the tensile strength.
- It is better to leave the suture material in situ for too long rather than not long enough.

Thread Strength		
Metric	USP	Diameter (in mm)
0.01	12/0	0.001–0.009
0.1	11/0	0.010–0.019
0.2	10/0	0.020–0.029
0.3	9/0	0.030–0.039
0. 4	8/0	0.040–0.049
0.5	7/0	0.050–0.069
0.7	6/0	0.070–0.099
1	5/0	0.100–0.149
1.5	4/0	0.150–0.199
2	3/0	0.200–0.249
2.5–3	2/0	0.250–0.349
3.5	0	0.350–0,399
4	1	0.400–0.499
5	2	0.500–0.599
6	3	0.600–0.699
7	5	0.700–0.799

Source: Chirurgischer Wundverschluss im Dentalbereich, B. Braun Melsungen AG

11 Conversion chart for thread strength classification.

2.3 Needle holder

The task of the needle holder is to fix the needle and thread and guide them safely through the tissue during suturing. A distinction is made between two different types of needle holders:

- Needle holder with a lock (eg, Matthieu, Mayo-Hegar)
- Needle holder without a lock (eg, Axhausen, Toennis)—extremely rarely used

Needle holders with a ratchet locking system securely fix the needle between the jaw surfaces. This allows easy guidance of the needle through the tissue, especially in surgical areas that are difficult to access. In contrast, there are needle holders without a ratchet locking mechanism, which require the surgeon to apply pressure to fix the needle.

Both types of needle holders are available in various lengths, widths, and branch sizes. Each operator must choose from the variety of needle holders available according to his or her preferences.

Needle holders are highly specific, just like needle and thread. Needles with a diameter of 3/0, 4/0, or 5/0 require large, robust jaw surfaces. For microsurgical or periodontal surgical procedures with a suture thickness of 6/0 or 7/0 or more, a microsurgical needle holder with delicate and fine jaw surfaces (Castroviejo needle holder) is required. Microsurgical needle holders should be held in the hand like a pen. The rest of the needle holder also has specific modifications to allow very thin needles and sutures to be easily guided through the tissue.

12 **Baby-Crile-Wood needle holder (BM013R from Aesculap Dental).**

13 **Castroviejo microsurgical needle holder (FD258R, Diadust from Aesculap Dental, with diamond powder–coated working ends for suture material of thickness 6/0 to 9/0).**

2 Pictures: teamwork media GmbH

2.4 Tweezers

Tweezers (or forceps) are a type of grasping instrument and are divided into dental, surgical (Fig 14), and anatomical depending on their function. The functions of these instruments are the insertion and removal of materials into the surgical area and the fixation of the tissue during suturing. While dental tweezers have a curved working end, anatomical and surgical tweezers have a straight working end. For a secure hold and for moving tissue, surgical tweezers have two teeth at the working end, which interlock perfectly when closed. In contrast, dental and anatomical tweezers have a transversely serrated working end without teeth. It should be noted that the teeth on surgical tweezers can traumatize the tissue during fixation.

In the case of microsurgical and periodontal plastic surgical procedures where 6/0 and smaller needles are used, the microsurgical tweezers (or forceps) have delicate working ends with diamond powder coating rather than serrated surfaces to minimize damage to delicate tissues. An additional use of microsurgical forceps is in the capturing of the smaller needles in microsurgical procedures. For this purpose, the jaws may be lightly roughened, or diamond dusted rather than transversely serrated to improve grip on the suture (Fig 15). Serrated jaws are too coarse for microsurgery and are more likely to injure the suture and bur the needle leading to trauma to the delicate tissues.

2.5 Scissors

Scissors are used in oral surgery for cutting suture material and suture removal and also for cutting tissue. Straight or slightly curved scissors with a pointed working end are used for cutting suture material and preparing tissue.

Absorbable sutures should be shortened as much as possible to avoid unnecessary absorption of suture material. In contrast, nonabsorbable sutures should be shortened to a length of 4 to 6 mm. This avoids unpleasant poking of the suture ends and facilitates suture removal.

Microsurgical scissors are commonly used for microsurgical and periodontal surgical procedures in the same way as microsurgical needle holders and forceps (Fig 16).

Picture: teamwork media GmbH

14 **Cooley atraumatic micro forceps (DX303R from Aesculap Dental).**

15 **Microsurgical forceps (Micro Dressing Forcep 8-905DD from Hu-Friedy).**

16 **Micro Castroviejo scissors (S31 from Hu-Friedy).**

3. General Rules of Suturing in Dental Surgery

Suturing is the most important step of any surgical intervention in the oral cavity because it determines predictable success or failure in almost all cases. The purpose of suturing is the appropriate adaptation of the wound edges during the healing phase.

It is important to use the correct instruments. The use of the appropriate needle holder, tweezers, and scissors is crucial when suturing (see chapter 2).

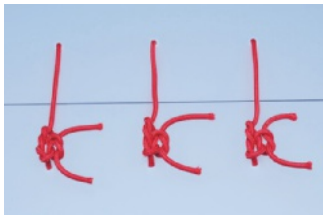
When starting each suture after the needle has been picked up, the soft tissue of the movable flap is first pierced with the needle and then joined to the fixed soft tissue. Opinions regarding the ideal holding position of the needle holder vary slightly. The grip of the needle for 6/0 and 7/0 suture material should be at the midpoint of the needle to avoid bending of the needle that occurs when the needle is gripped near the jaw of the needleholder. The needle should penetrate perpendicular to the tissue. Alternatively, the needle holder may hold the needle at a ratio of 2/3 (distance from the needle tip to the jaw of the needle holder) to 1/3 (distance between the jaws of the needle holder to the needle-thread transition). This is to prevent the needle tip from being bent or otherwise damaged due to lack of control (which occurs when the needle is picked up too far from the tip) and also to prevent the action radius from being too restricted (which occurs when the needle is picked up too close to the needle tip). In principle, the needle insertions should be done in the attached gingiva to prevent scarring. To prevent tearing of the tissue, grasping at least 3 to 5 mm from the tissue margins is essential. For oral surgery, the authors recommend the use of monofilament suture materials, which should have a USP strength of 4/0 to 7/0, depending on the area of application. In soft tissue surgery, especially in periodontal plastic surgery, the use of 6/0 and 7/0 sutures is recommended. With thinner sutures, the added benefits fail to compensate for the extra effort required. For the classic surgical knot, a 2-1-1* knot is sufficient for sutures thicker than 6/0. For sutures size 6/0 and thinner, the authors recommend tying a 3-2-1, 3-1-2, or 3-1-1 knot, as this largely prevents the knot from coming loose, especially after the first fixation. The knot should therefore be secured with a series of clockwise and counterclockwise knots.

Tip: Absorbable sutures are advisable for subcutaneous and multilayer sutures, as well as for patients with mental and physical disabilities. Except for these special indications, the monofilament, nonabsorbable suture is the material of choice because of the low tissue reaction.

* The numbers indicate the number of times each knot is thrown over, with the first and third knots tied in the same direction and the second knot tied in the opposite direction.

4. The Surgical Knot: Suture Techniques

Suture Techniques and Their Indications at a Glance

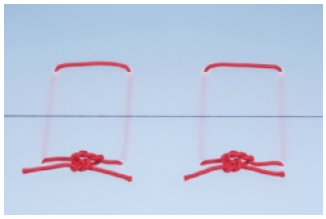


4.1 Single button suture (see p 14)

- Most commonly used suture
- Adaptation of wound edges
- Initial suture for stabilization of complex flaps
- Blood vessel ligation
- Not suitable for relieving tension in flaps

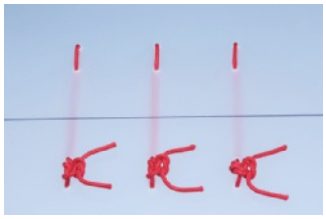
4.2 Mattress suture

- Suitable for relieving tension in flaps
- Active positioning of the flap and wound edges
- Used in extractions and periodontal and implant surgery
- Important for coverage after augmentation
- Important for primary wound closure following, among other things, augmentation procedures



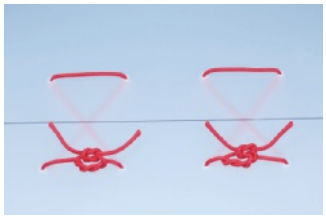
4.2.1 Horizontal mattress suture (see p 22)

- Most important suture for covering defects and after augmentation procedures
- Enables two-dimensional adaptation of the wound edges and stabilization of the flap



4.2.2 Vertical mattress suture (see p 30)

- Indicated for limited horizontal space conditions (eg, between teeth)



4.2.3 Cross mattress suture (see p 38)

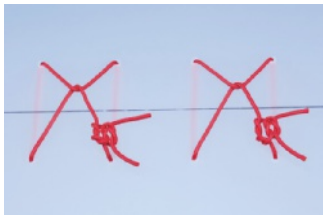
- Used in extractions to stabilize the blood clot and wound edges
- In the case of inhomogeneous alveolar ridge anatomy, used to achieve stable adaptation of the wound margins

4.3 Laurell suture

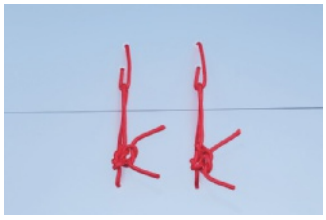
- Suitable for relieving tension in flaps
- Active positioning of the flap and wound edges
- Used in extractions and periodontal and implant surgery
- Helps with coverage after augmentation procedures
- Helps in the creation of primary wound closure

Note: Also referred to as Laurell-Gottlow suture; combination of mattress and single button sutures.

- Advantage: Saves time compared to the combination of mattress and single button sutures.
- Disadvantages: If part of the thread comes loose, the entire suture comes undone; the position of the single button suture depends on the position of the mattress suture.



4.3.1 Horizontal Laurell suture (see p 42)

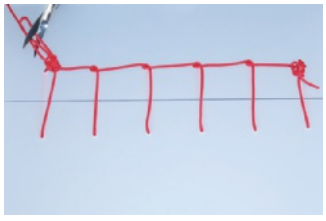


4.3.2 Vertical Laurell suture (see p 50)

4.4 Continuous suture (see p 58)

4.4.1 Simple continuous suture

4.4.2 Continuous interlocking suture



- Closure of long incisions that do not have great esthetic relevance
- For gaping wounds after serial extractions
- In the edentulous ridge
- For repositioning osteotomies in the maxilla

Note: Corresponds to a sequence of interconnected single button sutures.

- Advantage: Saves time compared to single button sutures.
- Disadvantage: If a part of the thread comes loose, the tension of the thread is released in the entire surrounding tissue.

4.5 Simple sling suture (see p 66)

- Suitable for securing a coronally advanced flap
- Tunneling procedures
- Used in root coverage procedures
- Important for adapting the tissue margin at the CEJ
- Can be used for a single tooth or multiple teeth

This book is a concise resource for understanding the myriad suturing options available to dentists today. It includes recently developed suturing concepts pertinent to both conventional oral surgery and oral microsurgery. The text is supplemented with step-by-step drawings and photographs of the various techniques performed on an animal model, which once mastered can be readily applied in a clinical setting. The final chapter discusses the management of the occasional complications encountered during and after surgery.

ISBN: 978-1-78698-123-3

9 781786 981233

www.quintessence-publishing.com