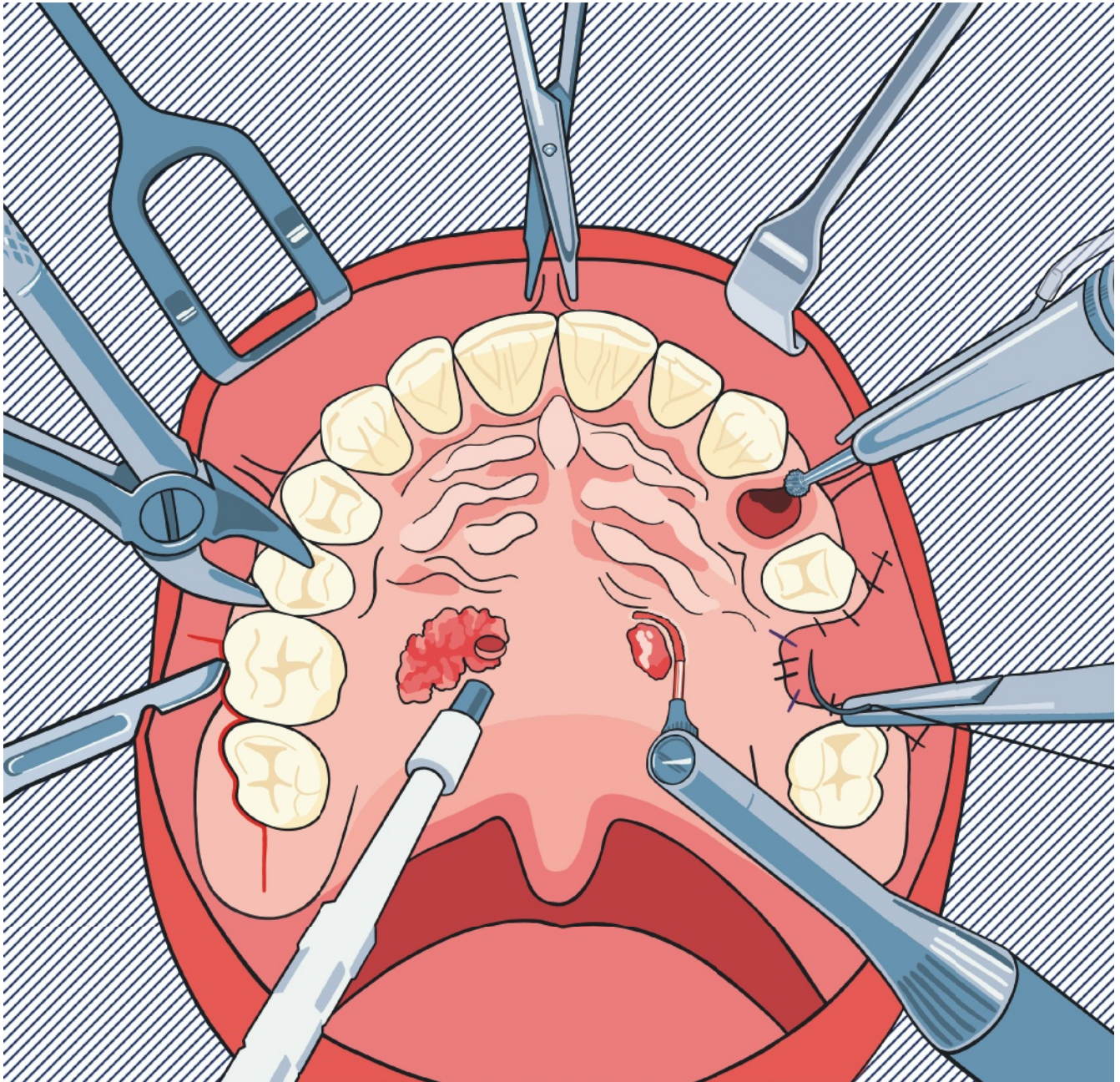


Andreas Filippi | Fabio Saccardin | Sebastian Köhl (eds)



BASIC ORAL SURGERY



Andreas Filippi | Fabio Saccardin | Sebastian Kühl (eds)



BASIC ORAL SURGERY

With contributions by:

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Preface



Only a few decades ago, German university dentistry consisted of four core subjects: Operative Dentistry and Endodontics, Prosthetics, Orthodontics, and Oral Surgery. Since then, beginning with a detachment of orthodontics from general dentistry, specialization within dentistry has increased. Such specialization is the result of an enormous increase in knowledge and scientific evidence within dentistry. However, it also means that, nowadays, professionals practicing general dentistry prefer to refer complex anamneses, cases, and/or patients to specialists for treatment due to a lack of equipment or know-how or for financial reasons. Furthermore, there is also a group of (self-paying or privately insured) patients who prefer to be treated by a specialist than by a general practitioner – a trend that has existed in the medical field for quite some time. Particularly in and around larger cities, there are now specialist practices for endodontology, periodontology, pediatric dentistry, implantology, craniomandibular function, sports dentistry, and even oral surgery or oral and maxillofacial surgery.

There are also dental professionals who do not wish to perform oral surgery in their daily practice. On the one hand, this is understandable if experience, skills or confidence are lacking, and thus the time and expenditure invested are disproportional to the turnover and success rates. On the other hand, however, it is inconvenient to constantly refer tooth extractions to a specialist dentist. After all, it is not only older patients who greatly appreciate it when most treatments can be performed at their family dentist.

Practical oral surgery training within dental education has not improved in recent decades.

There are understandable reasons for this: Especially at universities with very high student numbers, it can be difficult to find a sufficient number of patients who require surgical procedures (implants, apicoectomies, wisdom tooth removals, etc) that can be performed by students. Also, there is a high level of supervision required because a dentist must be available in the immediate vicinity to assist the student for the entire duration of the procedure. Another reason is that one can complete a postgraduate degree in oral surgery and specialize in this way. This reduces the pressure on universities to teach all practical oral surgery skills during undergraduate dental education: from tooth extraction to plastic surgery to surgical tooth removal, tooth-preserving surgery, soft tissue surgery, and implant surgery. It is therefore not surprising that postgraduate practical training courses on basic oral surgery are attended by younger colleagues, in particular.

The same phenomenon has been experienced for many years in orthodontics: Theoretical training during undergraduate education is good, while practical training de facto does not exist and must be acquired after graduation. Postgraduate training centers and master's degree programs in this field are in high demand, and thus the chances of obtaining a specialist dental degree are rather slim.

This book deals exclusively with the basics of oral surgery, which is often not taught sustainably enough during undergraduate dental education. It is therefore simply missing after graduation and is often covered too briefly and in too text-heavy a manner in textbooks. However, it is precisely these fundamentals of oral

Preface

surgery that are required in order to be able to perform the many basic procedures that occur in general dental practice without raising blood pressure and causing a sweat to break out.

This book is not designed as a textbook, but rather as an atlas: The clinical chapters in particular all map their theoretical content in an identically structured manner: indications, contraindications, specific risks, local anesthesia, step-by-step clinical procedure, wound care and closure, postoperative controls and course, and only a few relevant literature references. The strength of these chapters is the series of images and the videos embedded with links, which can be viewed via a smartphone or tablet. This combination is not only beautiful but also, and more importantly, it is timely, and significantly expands the scope and value of a reference book. This combination of images and videos means that the book should increase the practitioner's confidence before, during, and after oral surgical interventions. Some repetition in the content and also a few contradictory statements by the expert team of authors are intentional on the part of the editors.

Our special thanks go to all those who contributed to the creation of this book: our coauthors Stephan Acham, Zeynab Ahmed, Korbinian Benz, Constantin Berli, Michael Bornstein, Dorothea Dagassan-Berndt, Cornelia Filippi, Irène Hitz Lindenmüller, Norbert Jakse, Jochen Jackowski, Marc Joos, Petra Rugani, Bernd Stadlinger, Frank Striezel, Silvio Valdec, Hendrik Zeiß, and Andrea Zürcher.

Our thanks also go to Sabrina Peterer for the cover image, which continues the style of the

now iconic covers of Andreas Filippi's books; to Anita Hattenbach of Quintessence Publishing for the always trusting, incredibly pleasant, and highly professional editing; and to all the staff involved at Quintessence Publishing in Berlin. Thank you also for allowing us to link some screenshots and videos from the excellent app by Giulio Rasperini entitled "The Oral Surgery Suture Trainer."

Thank you too for allowing us to use surgical videos from the large collection of Sebastian Köhl, who films each of his treatments using a magnifier camera, and compresses them into short video clips.

And thank you to all our colleagues at our excellent and efficient Department of Oral Surgery at the University Center for Dental Medicine in Basel for your support. You are like family to us.

Basel, 31.08.2020

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Incision guides and flap techniques

Fabio Saccardin



4 Incision guides and flap techniques

In order to gain adequate access to the surgical site, different incision guides and flap techniques are practiced. Standard operating procedures exist for most oral surgical interventions and are discussed in detail in this book. However, it is not always possible to implement such a standard procedure, so the dentist should have some basic knowledge of common incision and flap techniques, which is the subject of this chapter.

During the incision, the scalpel is held like a pen. Very little pressure is required to cut through the mucosa, including the periosteum. The incision is made perpendicular to the mucosal surface to allow precise adaptation of the wound edges later. Without exception, the incision should be made on a bony base. Incisions that pass over an expected bony defect (e.g. in

cysts) should be avoided, as these frequently lead to wound dehiscence postoperatively. The length of an incision should be such that there is a sufficient overview of the surgical area without soft tissue tearing occurring at the end of the incision as a result of the hook traction, and also to ensure that structures that need to be anatomically protected, such as nerves or blood vessels, are not endangered by a wide extension. Furthermore, it should be possible to extend an incision intraoperatively. Oroantral communications after tooth removal in the maxillary posterior region are especially common and soft tissue coverage should be performed in the course of treatment. The incision chosen should also allow further surgical intervention at a later stage. Common errors in this regard include horizontal incisions at a future flap base, negatively affecting flap vascularization, loss of keratinized gingiva or displacement of the mucogingival boundary due to a soft tissue coverage where a future implant is surrounded by mobile mucosa.

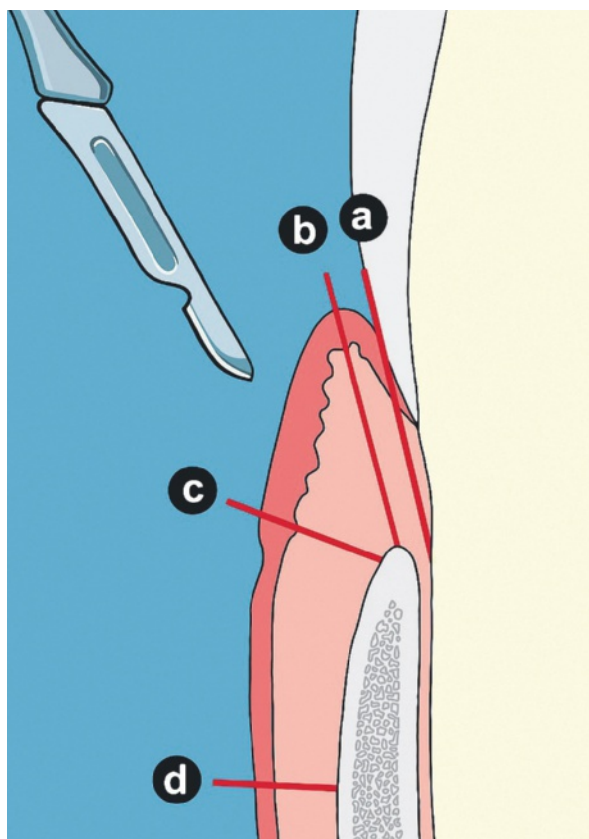


Fig 4-1 Primary incisions on the gingiva and mucosa: 'a' intrasulcular incision; 'b' marginal incision; 'c' paramarginal incision; 'd' mucosal incision.

Primary incisions

Primary incisions are usually performed in the gingival area. The incision can be intrasulcular, marginal or paramarginal (Fig 4-1). Only in exceptional cases are primary incisions required in the region of the mobile mucosa.

The intrasulcular incision (Figs 4-2 and 4-3), also called the sulcular or intracrevicular incision, is the gold standard in oral surgery and allows complete preservation of the marginal gingiva. The scalpel is aligned with the respective tooth axis and the blade is guided through the sulcus to the *limbus alveolaris* while maintaining constant contact with the tooth or root surface. The marginal and sulcular epithelium is preserved at the flap margin.

In the marginal incision (Figs 4-4 and 4-5), the incision is perpendicular to the mar-



Fig 4-2 Intrasulcular incision in region 11 to 22 in the case of imminent sequestrectomy (condition after anterior tooth trauma).



Fig 4-3 Labial bone sequestrum after incision and mobilization of the mucoperiosteal flap (same patient as in Fig 4-2).



Fig 4-4 Circular marginal incision around tooth 27 that is planned for removal, followed by soft tissue coverage (condition after radiotherapy).



Fig 4-5 Marginal incision followed by removal of tooth 27 and formation of a trapezoidal flap for soft tissue coverage (same patient as in Fig 4-4).

gingival gingiva, so that after flap mobilization, the marginal and sulcular epithelium remain on the tooth surface. The flap margins are deepithelialized, which is particularly relevant in the case of soft tissue coverage, as otherwise a meeting of epithelialized wound margins does not lead to primary wound healing and carries the risk of wound dehiscence. If adjacent teeth are included in the incision, it is continued in a garland shape. It should be noted that the incision in the interdental area is guided to the neighboring tooth, and the blade is repositioned from there.

The paramarginal incision (Figs 4-6 and 4-7, Video 4-1), also called the submarginal incision, also runs in a garland shape approximately in the middle of the keratinized (attached) gingiva. The basic prerequisite is, of course, a sufficiently wide keratinized gingiva of at least 5 mm. In addition, the incision should not be made through a periodontal pocket. A preoperative survey of the probing values is therefore necessary.

The crestal incision is usually located in the center of an edentulous area on the alveolar ridge (Figs 4-8 and 4-9, Video 4-2). This inci-

4 Incision guides and flap techniques

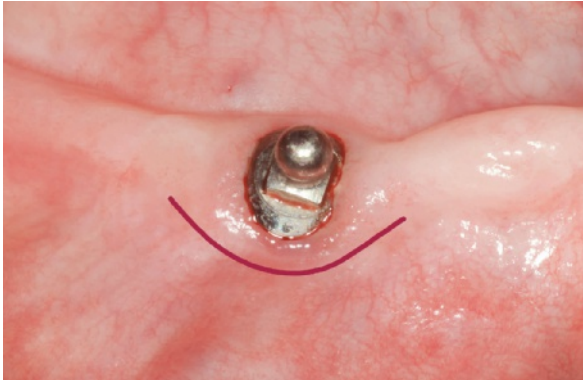


Fig 4-6 Paramarginal incision labial to the implant in region 43.

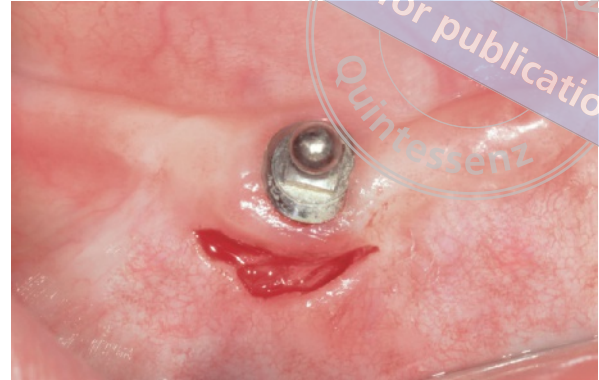


Fig 4-7 After incision and preparation of the recipient bed for free mucosal graft (same patient as in Fig 4-6).

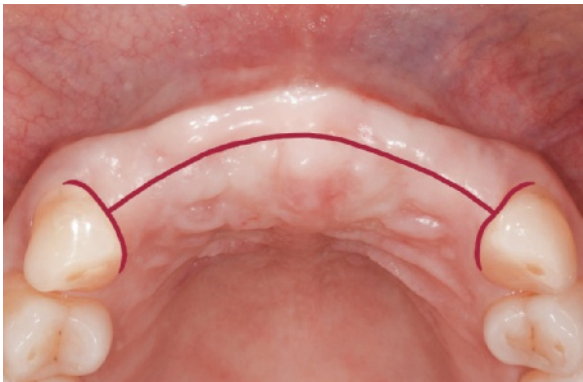


Fig 4-8 Crestal incision in region 12 to 22.



Fig 4-9 After mobilization of the mucoperiosteal flap labially and palatally (same patient as in Fig 4-8).



Video 4-1
Paramarginal incision in combination with a split flap.

Video 4-2
Crestal incision with intrasulcular relief on adjacent teeth.

sion is particularly useful in implantology. If two additional vertical releasing incisions are made after the crestal incision to form a trapezoidal flap, the primary incision must not be located too far orally, otherwise there is an increased risk of wound dehiscence due to the low flap vascularization.

The (intra-)mucosal incision is apical to the mucogingival border in the area of the mobile mucosa (Figs 4-10 and 4-11, Video 4-3). This

Video 4-3 Mucosal incision on right retromolar area for removal of a bone block.



Fig 4-10 Mucosal incision.

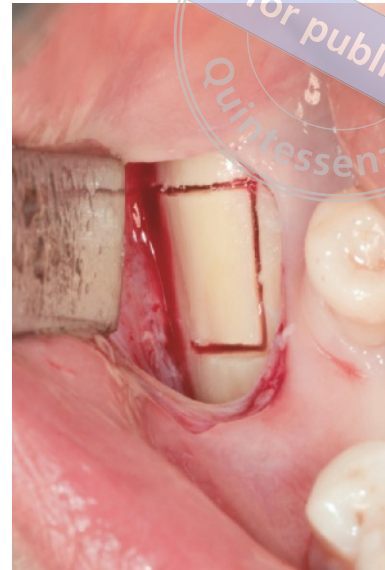


Fig 4-11 After mobilization of the mucoperiosteal flap and formation of predetermined breaking points for bone block harvesting (same patient as in Fig 4-10).

type of incision was used in the past, particularly in tooth-preserving surgery for apicoectomy or for open exposure and alignment of impacted teeth: Angle section according to Reinmüller, trapezoidal section modified according to Hauberisser, and arch section modified according to Partsch or Pichler were common here. Today, the (intra-)mucosal incision has hardly any indications, since it often lies over the bony defect in the case of extensive apical pathologies, and also shows wound dehiscence more frequently due to higher flap mobility. In addition, unsightly scar lines are produced.

Releasing incisions

After the primary incision, releasing incisions are often necessary to obtain an adequate view of the surgical area, but also to mobilize and hold the flap without tension. These incisions can be made in a horizontal or vertical direction.

The horizontal releasing incision (Figs 4-12 and 4-13) is simply a continuation of the primary incision already made at the gingival margin in the mesial and/or distal direction. A lateral exten-

sion by more than two adjacent teeth is usually not necessary. The advantage of this releasing incision is that vertical relief can be dispensed with and apically located anatomical structures, such as nerves and blood vessels, are thus spared.

In the vertical releasing incision (Figs 4-14 and 4-15), the incision is made from apical, usually in the region of the adjacent tooth, to mesial and/or distal of the primary incision (triangular flap and trapezoidal flap). Within the attached gingiva, however, the incision is angled so that it is perpendicular to the marginal gingiva. If this is not taken into account, pointed flap margins and possibly unsightly retractions at the gingival margin will result postoperatively. To minimize the risk of postoperative recession, the releasing incision should end in the mesial or distal third of the gingival margin of a tooth, and never median or at the lowest point of the gingival margin or even interdentally through the papilla. If an apically or coronally advanced flap is planned as part of a periodontal surgical procedure, the vertical releasing incision can also be designed in a C-shape, with the advantage that the flap can be more easily adapted later, and, above all, without tension. In general, the

4 Incision guides and flap techniques



Fig 4-12 After intrasulcular horizontal releasing incision in the palatal region 14 to 24 during a cystectomy.

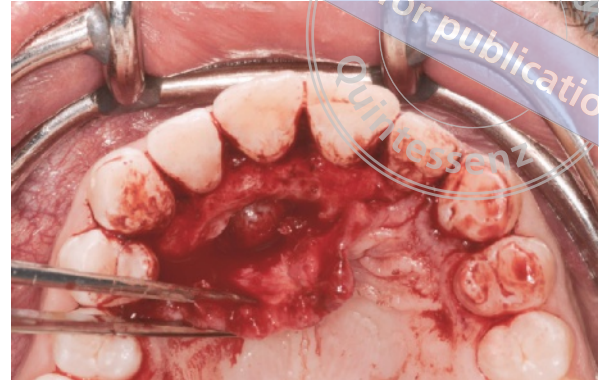


Fig 4-13 After preparation of the mucoperiosteal flap and visualization of the cyst bellows (same patient as in Fig 4-12).



Fig 4-14 Intrasulcular incision starting from the distal third of tooth 11 to the distal third of tooth 22 with a vertical releasing incision (apical region 21 shows scar lines from a past mucosal incision; condition after apicectomy).



Fig 4-15 After mobilization of the mucoperiosteal flap and defect visualization for the upcoming revision of the retrograde root canal filling, including post resection of root apex 21 (same patient as in Fig 4-14).

major advantage of a vertical releasing incision over a horizontal one is that the widening of the surgical approach is localized.

Incisions in the esthetic region

Especially in the esthetic region in patients with a high smile line, recessions and unsightly scarring of the gingiva resulting from incorrect incision

guides are unforgivable. Today, however, there is some predictability as to which incision pattern carries which postoperative recession risk. The intrasulcular incision (Fig 4-16) shows an average recession of 0.42 mm after 1 year, while the paramarginal incision (Fig 4-17) shows only 0.05 mm. No recessions were observed in the papilla base incision (Fig 4-18) within 1 year⁴. In general, changes in the periodontium due to incisions are expected mainly in the first year, after which the periodontal situation stabilizes over

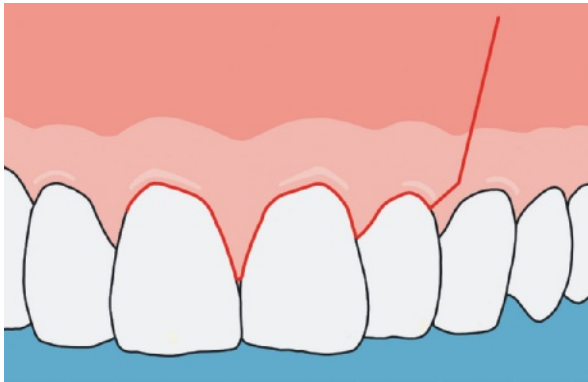


Fig 4-16 Intrasulcular primary incision with vertical relief in a triangular flap.

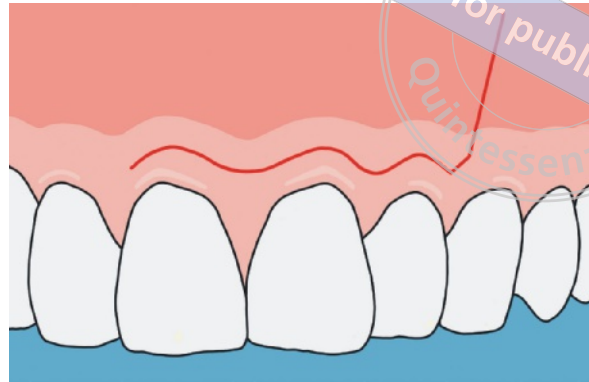


Fig 4-17 Paramarginal primary incision with vertical relief in a triangular flap.

an observation period of 5 years³. Even though recessions are less frequent and more discrete after a paramarginal incision, this incision often leaves unsightly scars that are exposed during laughter. Therefore, the papilla base incision is to be preferred in the esthetic region.

However, in addition to the incision route, the pressure during flap mobilization through the raspatory on the marginal bone, the exposure time of the bone (45 to 90 minutes), and the dehydration of the flap also play a decisive role^{1,2}.

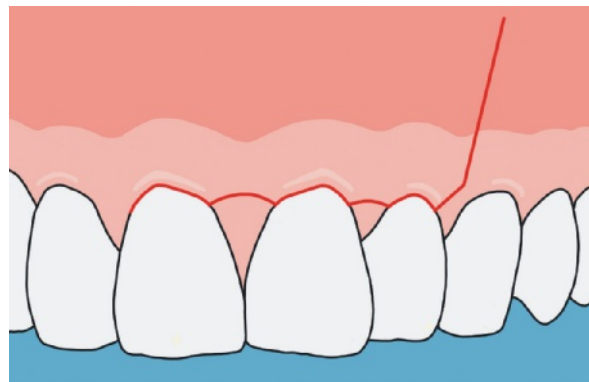


Fig 4-18 Papillary base incision as the primary incision with vertical relief in a triangular flap.

Abscess incisions

Submucosal abscesses due to acute exacerbation of infection must be incised and drained as part of emergency treatment. The location and direction of the incision must be carefully considered so that further oral surgery with flap formation is possible after the acute infection at the incision site has subsided. Therefore, horizontal incisions at the future base of the flap should be avoided because they negatively affect flap vascularization.

Primarily, vestibular submucosal abscesses in the maxilla should rather be opened via a

vertical incision in the area of the future incision of a flap and palatally via an intrasulcular incision (Figs 4-19 and 4-20). If the incision site is not directly at the abscess, a blunt preparation with a raspatory must be prepared with constant bone contact up to the abscess, and the abscess spread. However, palatal abscesses are more frequently located medially and are poorly accessible for blunt preparation due to the curvature of the *palatum durum*, so that in these cases (para-)marginal incisions or those at the

4 Incision guides and flap techniques



Fig 4-19 Submucosal abscess (marked here in red) starting from tooth 22, with the vertical incision in the area of the future incision guide in the case of flap formation.



Fig 4-21 In exceptional cases, a poorly accessible abscess in the palatal region (marked here in red) can be opened by a marginal incision or at the *punctum maximum*, taking the palatal artery into consideration.

punctum maximum are permissible (Fig 4-21). The course of the palatal artery must be taken into account. If necessary, the future incision site can be punctured with a cannula to exclude a possible crossing of the incision with the palatine artery.

In the mandible, intrasulcular incisions are generally preferred in order to avoid blood ves-



Fig 4-20 Intrasulcular abscess incision in the case of a palatally located submucosal abscess (marked here in red) starting from tooth 28.

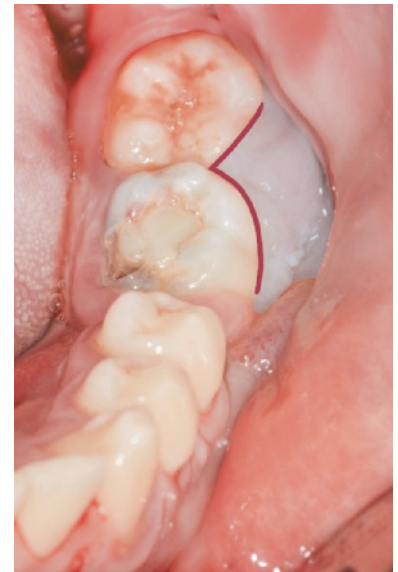


Fig 4-22 Paramandibular abscess (marked here in red) starting from tooth 36, showing the intrasulcular incision.

sels and nerves in the area of the mental foramen and the floor of the mouth, as well as the mimic musculature at the mentum (Fig 4-22). Again, the abscess is ultimately opened by blunt preparation with a raspatory via an intrasulcular incision (Fig 4-22).

After opening and spreading the abscess, the interior is irrigated with antiseptic until clear

Fig 4-23 Trapezoidal mucoperiosteal flap after incision.

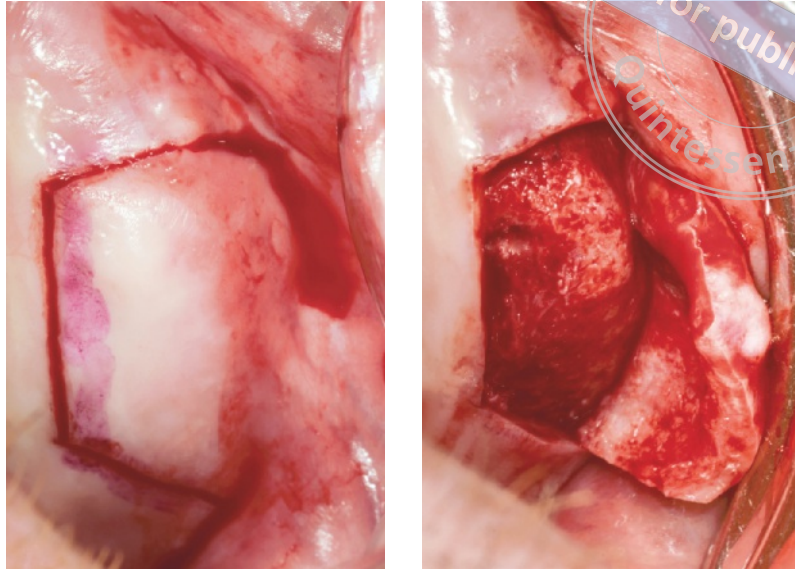


Fig 4-24 After detaching the mucoperiosteal flap from its bony base.

reflux is visible. This is followed by the insertion of a drain. Here, silicone tubes can be fixed with a suture, or iodoform/vaselinated cotton strips can be inserted to ensure postoperative pus drainage. After incision, an odontogenic focus must be treated promptly. In the case of submucosal abscesses with a tendency to spread (pronounced extraoral swelling, reduced jaw opening, pressure pain at the angle of the jaw or eye, reduced general condition, difficulty swallowing or fever) or with a general medical indication, adjuvant systemic antibiotic administration is recommended (usually amoxicillin with clavulanic acid, or clindamycin in the case of penicillin allergy). The first control should take place on the following day. The procedure of the local antiseptic measure, including drainage change if a cotton strip has been inserted, is repeated daily until there is no more leakage of pus.

Soft tissue flaps and mobilization techniques

In most oral surgical procedures, the surgical approach is via a soft tissue flap. Flaps are named

according to their tissue composition (mucoperiosteal flap, mucosal flap), their future location (apically, coronally or laterally advanced flap), and their shape (trapezoidal flap, triangular flap).

In the mucoperiosteal flap, also called the full flap, the entire soft tissue, which consists of epithelium, subepithelial connective tissue, and periosteum, is detached from the bony support with a raspatory (Figs 4-23 and 4-24). This is facilitated if the incisions defining the flap overlap slightly so that the flap can be detached cleanly. If there is only one vertical releasing incision laterally of the primary incision, the flap is a triangular flap; if there are two vertical releasing incisions, the flap is a trapezoidal flap. In the case of a trapezoidal flap, care should be taken to ensure a sufficiently wide flap base so that sufficient flap vascularization is guaranteed postoperatively. With regard to the blood supply, the following applies: In the maxilla, vascularization takes place from cranial to caudal and in the mandible from distal to mesial. If scars are already present at the future flap base, a more generous extension of the flap is indicated.

After incision, the mucoperiosteal flap is carefully lifted from the bony base with only a lit-

4 Incision guides and flap techniques

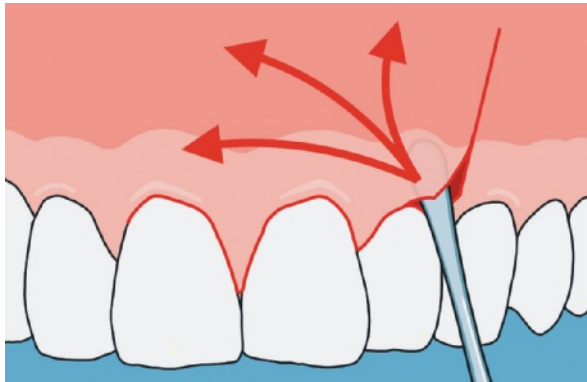


Fig 4-25 Instrument pressure that is directly applied on the marginal attachment damages the bone and the periodontium.

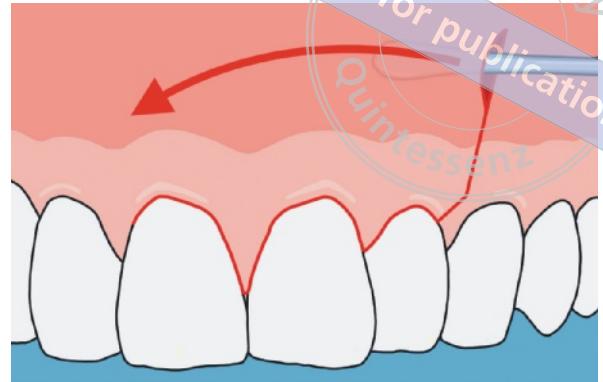


Fig 4-26 Mobilization is initially performed by tunneling preparation apical to the mucogingival margin.

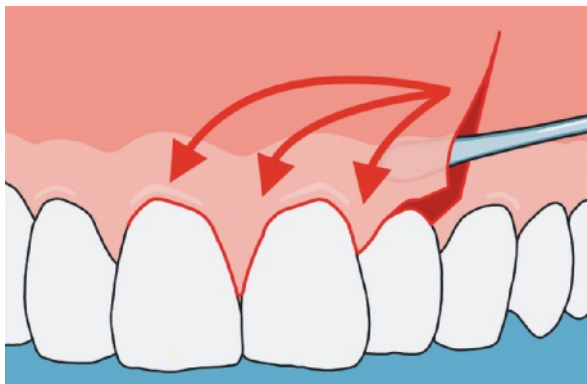


Fig 4-27 Only secondarily is the attached gingiva mobilized from the mucogingival border toward the sulcus.

tle pressure at the corners using a fine raspatory, then mobilized apically (Fig 4-25). The sharp working end of the raspatory should always be directed toward the bone. Tearing or bruising of the soft tissue should be avoided because it leads to more pronounced swelling and pain postoperatively. In addition, too much pressure from the instrument on the marginal bone causes recessions. Therefore, especially in the esthetic region, it is recommended to mobilize the flap by a tunneling technique, from lateroapical to

the mucogingival border to coronal to the sulcus (Figs 4-26 and 4-27)¹.

The advantage of the mucoperiosteal flap is that the flap is very well vascularized due to the periosteum. However, detachment of the periosteum from its bony support results in some resorption of the alveolar bone.

The mucosal flap, also called the partial flap or the split flap, consists only of epithelium and subepithelial connective tissue of the mucosa. Residual portions of the subepithelial

Fig 4-28 Triangular mucosal flap after incision.

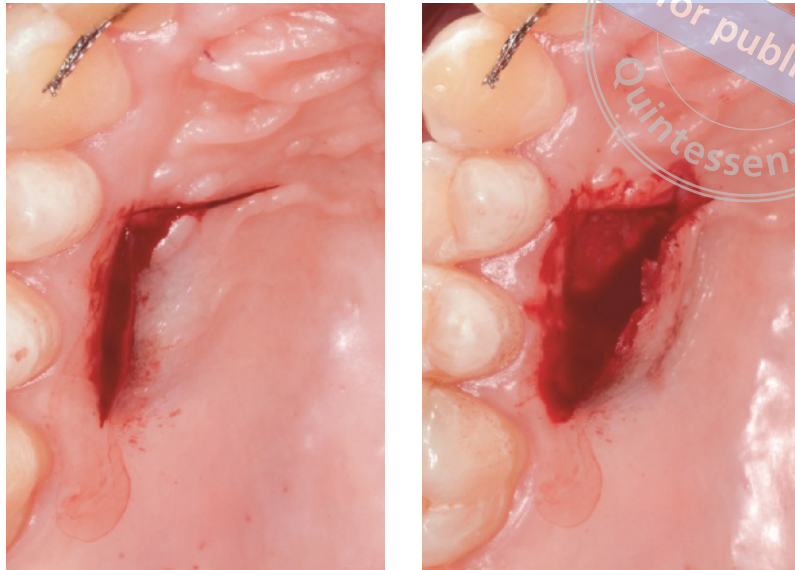


Fig 4-29 After sharp preparation of the mucosal flap.

connective tissue and the periosteum remain on the bone surface. Thus, the mucosal flap is thinner and somewhat less well vascularized than the mucoperiosteal flap. The preparation in this case is sharp, performed ideally with a microscalpel (Figs 4-28 and 4-29). Perforations must be avoided in the process. The greatest danger is in the region of the mucogingival border, where the mucosa is often very thin and frequently a bony prominence is present at the same time. The minimum flap thickness should not be less than 1 mm, otherwise the flap will no longer be sufficiently vascularized and there will be a risk of flap necrosis. This splitting technique is not easy, especially for beginners, and should therefore be learned at the beginning on a porcine jaw.

The great advantage of the mucosal flap is that the lack of periosteum ensures greater flap mobility. This enables tension-free wound

closure, especially in the case of advanced flaps (apically, coronally or laterally). However, the mucosal flap can also be used to harvest a connective tissue graft.

References

1. Harrison JW, Jurosky KA. Wound healing in the tissues of the periodontium following periradicular surgery. *J Endod* 1991;17:425–435.
2. Levin MP, Grower MF, Cutright DE, Getter L. The effects of length of surgery on healing of full and partial thickness flaps. *J Oral Pathol* 1977;6:152–160.
3. Von Arx T, Alsaeed M, Salvi GE. Five-year changes in periodontal parameters after apical surgery. *J Endod* 2011;37:910–918.
4. Von Arx T, Vinzens-Majaniemi T, Bürgin W, Jensen SS. Changes of periodontal parameters following apical surgery: a prospective clinical study of three incision techniques. *Int Endod J* 2007;40:959–969.

Practical oral surgery skills – including tooth removal, plastic surgery, surgical tooth removal, tooth-preserving surgery, soft tissue surgery, and implant surgery – are often neglected in dental school education or are only taught postgradually. However, it is precisely these skills that are necessary for every dentist to be able to perform the many basic procedures in general dental practice without blood pressure being raised and a sweat breaking out.

This book deals exclusively with the basic oral surgical procedures that are necessary on a daily basis in the dental office. The clinical chapters are all identically divided into indications, contraindications, specific risks, local anesthesia, step-by-step clinical procedure, wound care and closure, and postoperative controls. The text is supplemented by only a few relevant literature references.

The strength of this book lies in the series of images as well as the videos embedded with links, which can be viewed via QR codes using a smartphone or tablet. This combination of images and videos is intended to give students, early career professionals, and practitioners more confidence before, during, and after oral surgical interventions.



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