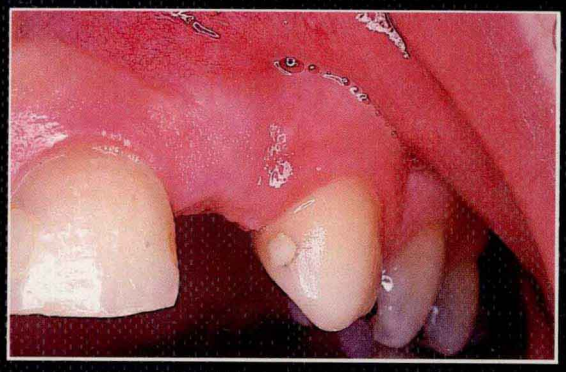
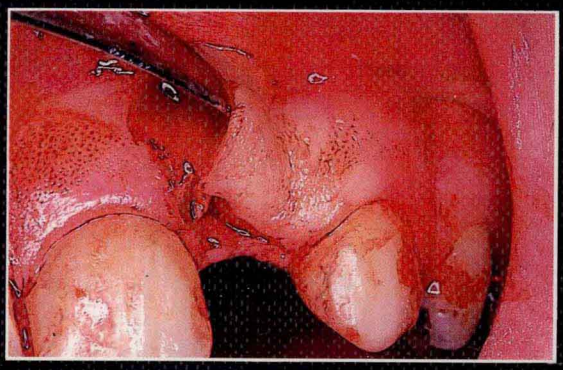
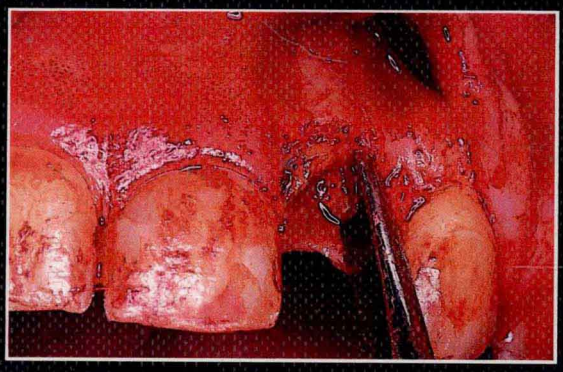
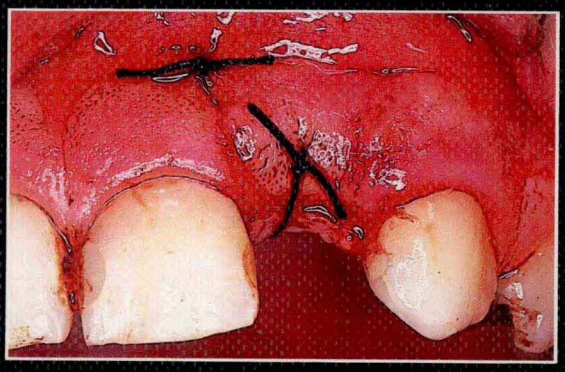
An Atlas of Minor Oral Surgery









Principles and Practice

David A McGowan

Clinical Techniques in Dentistry

An Atlas of Minor Oral Surgery

Principles and Practice

David A McGowan

MDS, PhD, FDSRCS, FFDRCSI, FDSRCPSG

Professor of Oral Surgery
University of Glasgow

Martin Dunitz London

The C V Mosby Company
St Louis Baltimore Philadelphia Toronto

First published in 1989 by
Martin Dunitz Ltd, 154 Camden High Street, London NW1 0NE

Distributed in the United States by
The C V Mosby Company, 11830 Westline Industrial Drive, St Louis, Missouri 63146, USA

Distributed in Canada by
The C V Mosby Company, Ltd, 5240 Finch Avenue East, Scarborough, Ontario, Canada M1S 5A2

Library of Congress Cataloging-in-Publication Data

McGowan, David A., *1939–*
An atlas of minor oral surgery.
1. Man. Oral region. Surgery
I. Title
617.'522059
ISBN 0–8016–3316–8 (Mosby)

Laserset by Scribe Design, Gillingham, Kent
Originated, printed and bound by Toppan Printing Company (S) Pte Ltd, Singapore

Preface

Despite the success of prevention, and the improvement in dental health in many parts of the world, the ability to extract teeth is still a necessary skill for most dentists. Patients do not relish the experience, but control of anxiety, avoidance of pain and reduction of discomfort will earn their gratitude. As in any form of surgery, complications must arise from time to time, and the dentist who undertakes to extract teeth has to be prepared to meet them. The skills, equipment and practice organization required for these purposes can be usefully employed in preplanned dento-alveolar surgery, and this continuing activity in turn ensures efficiency of response when the need arises.

The purpose of this book is to promote a systematic and organized approach to minor oral surgery, while still allowing for variation in technique to suit personal preference, local circumstances and, most important of all, the needs of the individual patient. General principles are emphasized and illustrated by examples of the commoner procedures. 'Minor oral surgery' comprises those surgical operations which can comfortably be completed by a practised nonspecialist dentist in not more than 30 minutes under local anaesthesia. This defines the scope of the book. It is intended as a guide to all those who wish to learn, or improve their knowledge of this branch of the surgeon's art, but cannot replace the one-to-one instruction and guidance which the beginner requires. I hope to pass on some of the lessons learnt as a teacher of students and practitioners over a number of years and, in doing so, I dedicate this book to the patients in our dental schools and hospitals in recognition of their contribution to the advance of our profession.

Contents

Part I Principles

1 Diagnosis and treatment planning

All surgery produces tissue damage and patient morbidity, so every operation must be justified by weighing benefit against detriment. There is no such thing as a 'routine' operation. The purpose must be one of the following:

- elimination of disease
- prevention of future disease or disadvantage
- removal of damaged or redundant tissue
- improvement of function or aesthetics.

To take a common example, the removal of a completely buried asymptomatic unerupted tooth or retained root fragment inflicts certain surgical damage and is not justified by the hypothetical risk of future infection. However, when there is a defect in the overlying mucosa, the balance of probability is completely altered and removal is advised.

Effective clinical decision-making depends on the gathering and objective analysis of relevant information, and then on judgment based on experience, instinct and, it must be admitted, even prejudice. The clinician can never allow him- or herself the certainty which patients demand.

A minor oral surgical operation is only one item in a patient's continuing dental care. The extraction of an impacted third molar, followed later by the extraction of the carious second molar which produced the symptoms in the first place, is not only foolish but damaging to the interests of both patient and dentist.

While diagnosis is a theoretical exercise, treatment planning must be responsive to the practical day-to-day realities of economic and social factors, and successful patient management depends on achieving the right balance.

Apart from the few purely soft tissue procedures, minor oral surgery diagnosis depends heavily on radiographs which are too often of poor quality and examined hastily. Acceptance of a low standard of radiographic diagnosis is frankly negligent.

Pre-operative assessment of difficulty cannot be exact, and the margin of error must always lie on the safe side. Overestimation of difficulty leads to relief and gratitude, while underestimation leads to embarrassment at least, and distress and litigation at worst. The general dentist who refers a difficult case to a specialist will earn the respect of both patient and colleague. With experience, the accuracy of assessment will increase and can be tailored to the increasing surgical competence of the operation.

Fitness for minor oral surgery

The dangers of minor oral surgery have been grossly exaggerated. Unnecessary apprehension has been aroused by a combination of dominant physicians ignorant of dentistry, and timid dentists ignorant of medicine. In fact, most of the fears experienced have little foundation. Excluding general anaesthesia, minor oral surgery under local anaesthesia, with or without sedation, is a remarkably safe undertaking.

It was formerly considered sufficient to believe that if a patient was fit enough to come to the surgery, they were fit to receive treatment – and the cautious sited their premises at the top of a flight of stairs! However, the success of modern medicine in keeping alive and active many patients who would have been at least bed-ridden in the past, has negated such a simple approach. From student days onwards, considerable efforts are made to educate dentists to a high level of knowledge and understanding of medicine, and it is now considered negligent to fail to obtain a current medical history and to appreciate its significance.

In case of concern, it is prudent to discuss potential problems with the patient's physician. It must, however, be remembered that advice once sought must be taken, and will always tend to err on the side of caution. Minor oral surgery, as defined in the preface to this book, does not

include the treatment of patients who are obviously acutely ill, or the chronically sick, unless they are ambulant and able to live a relatively normal life. Chronic disease, which is well-controlled and stable, is unlikely to raise problems, but the often complex medication itself can raise the possibility of unfavourable drug interactions. However, 2 to 4 ml of one of the commonly-used local anaesthetic solutions containing 2 per cent lignocaine with 1/80 000 adrenaline (US: 2 per cent lidocaine with 1/80 000 epinephrine) will not be harmful.

It is far more important to treat the patient with kindness and consideration, and to avoid the stress which triggers the release of endogenous catecholamines, than to complicate the issue by using allegedly safer preparations of less certain efficacy.

For a detailed discussion of the subject, the reader is referred to one of the many textbooks available which discuss the myriad possibilities at great length. Some recommended texts are listed in the Recommended Reading section.

2 Pre-operative preparation

Thorough preparation is the key to successful surgery, and the various aspects to be considered will be discussed in turn (see table below), but all the links in the chain are interdependent. Efficiency wins, and maintains, patients' confidence and co-operation. Difficulties arise more often from lack of planning, or forethought, than from any lack of manual skill.

Pre-operative check list

Patient
- Comfortable – physically and mentally relaxed
- Anaesthetized ± sedated – verbal
  - oral
  - intravenous
  - inhalational
- Informed consent
- Information – case records
  - radiographs

Equipment
- Light
- Suction
- Instruments
- Dressing/medicaments

Assistant
- Trained/informed

Operator
- Pre-operative assessment
- Operation plan
- Contingency plans

The patient

No one looks forward with pleasure to surgery, however minor, and perhaps the best that can be hoped for is indifference. Patients will be apprehensive to a variable extent and deserve sympathetic reassurance. Most fears will be alleviated by discussion, but shyness or shame about showing fear may impede communication. A patient must consent, at least verbally, to undergo the planned treatment. This can be done properly only if he or she has received an explanation of the operation, its purpose and procedure, and of the consequences, including an assessment of possible harmful effects. Radiographs are a great aid to explanation, and should be shown to the patient. An appraisal of the degree of sedation required needs to be made in advance, and the social consequence of both the operation and sedation discussed. On the operation day, the patient should obviously be received in a courteous, unhurried manner and seated comfortably in the chair. If possible, he or she should be accompanied home afterwards by a responsible adult.

Case records should be checked and placed in a position where they can be readily consulted during the operation without the necessity for handling. Radiographs must be properly illuminated and checked for correct identity and orientation in every case.

The equipment

The instrument kit required will vary with the demands of the procedure and the operator's preference. A suitable surgical kit is listed and illustrated in Appendix A (page 126). Instruments should be prepared and sterilized in kits, and will remain sterile if stored dry in a closed pack.

Two fundamental requirements, which cannot be overemphasized, are effective lighting and suction – good surgery is impossible without both and, when difficulty is encountered, the automatic response should be to check vision and exposure before taking any other action. While lighting is equally important for other dental procedures,

suction for surgical purposes should be of the high vacuum/low volume type to ensure the efficient removal of blood, as well as the saline irrigation. A large bore, high-volume apparatus produces drying of the wound and also carries the risk of the loss of small fragments of tooth or soft tissue, which should be retained for examination. Cutting equipment should be tested before the patient is brought in, and any dressings or medicaments required be made ready in advance.

The assistant

Minor oral surgery is a 'four-handed' procedure, and skilled assistance is vital. Most dental assistants enjoy the variety and the challenge of this kind of work, but need special training to be able to cope with the extra demands of the often apprehensive patient and the necessity for rigorous sterility. It is obviously vital to explain the operation plan to the assistant in advance.

The operator

The operator needs to be clear as to how he or she intends to proceed. Most, though not all, problems can be anticipated. The information obtained from the original history and examination, supplemented by radiography, is the basis of the operation plan required for a preliminary explanation to the patient and assistant. As the operation proceeds – particularly as the tissues are dissected and retracted – the options become clearer and a change of plan may be needed.

The patient should be positioned so as to give the operator a clear view and a comfortable working position.

3 The operation

All minor oral surgery operations follow a similar sequence of stages, which is the basis of a systematic approach (see table below). Adherence to a logical overall plan is a great help when difficulties arise. Like any other surgery, the sequence follows the anatomical tissue planes – first inwards until the objective is achieved, and then outward until the wound is repaired.

Stages of the operation sequence

- Retraction
- Incision
- Reflection
- Bone removal – access
  – point of elevation
  – removal of obstruction
- Tooth section
- Delivery
- Clean-up
- Sew-up
- Check-up
- Follow-up
- Write-up

Retraction

The first procedure is the placement of a suitable retractor so as to display the operation site and hold the lips, cheeks and tongue out of the way. The Kilner cheek retractor will control both lips and cheek, provided it is held at the correct angle so as to pouch out the cheek. The tongue is best controlled by ignoring it – conscious efforts by the patient are seldom helpful. When the retractor is in place, a final check should be made on the relative positions of the patient, the operator, the assistant, and the light.

Incision

The shape of the incision has to be planned with the needs of both exposure and closure in mind. A long incision heals as easily as a short one, and so exposure should be generous. While the mental nerve is the only significant structure at risk, thoughtful placement of incisions can reduce haemorrhage by avoiding unnecessary section of muscles or small constant vessels. Most incisions can be made on to the underlying bone, and this ensures separation of both mucosal and periosteal layers in the one cut. The hand should be steadied, if possible, by using a suitable rest for the fingers. Incisions may sometimes be conveniently extended with tissue scissors.

Reflection

The mucoperiosteal flap is reflected with a periosteal elevator, such as a Howarth's. Two elevators can be used to advantage at this stage – one working and the other aiding retraction in the subperiosteal plane. Adequate undermining of the wound margins is required in order to mobilize the flap. Generous reflection is the key to adequate vision, and wide exposure reduces traction trauma to the wound edges.

Bone removal

Removal of bone is usually required and, in the interest of vision and to reduce trauma from excessive elevating force, should be generous. This is most conveniently achieved by using a bur in a slow- to moderate-speed handpiece. Handheld chisels are useful in 'peeling off' thin layers of bone, and rongeurs are ideal when the blades can be placed either side of the piece of bone to be removed. Bone files are seldom required since sharp edges can be 'nibbled' off. Excessive

smoothing is unnecessarily traumatic and time-wasting.

Although generous in extent, bone removal must be calculated to achieve an end, and never be blindly destructive. The main objectives should be the achievement of access, the establishment of a point of application for an elevator (or forceps), and the removal of the obstruction to movement of the tooth or root. It may be that all these objectives may be reached simultaneously, but in any event they should be considered in that order. Slots or gutters around teeth or roots should be deep and narrow so as to preserve a fulcrum for leverage. Additionally the shape of the tooth must be borne in mind, both when clearing the cardinal points of the crown and in allowing for curvature and angulation of the roots.

Tooth section

Division of a tooth into a number of simpler, or more favourably shaped, segments may resolve the conflicts of the paths of withdrawal, or relieve impaction. This is best achieved by piercing the surface with a round bur, which is then sunk to the estimated width of the tooth, and the round 'shaft' converted into a slot with a fissure bur. Tungsten carbide tipped burs are essential for efficient cutting. The depth of all cuts should be judged so as to remain within tooth substance, and to avoid damage to the neighbouring structures. Final separation is achieved by levering within the slot with a flat elevator until the tooth cracks apart. In order to avoid propagating the crack through the bone, it is safer to gain even limited movement of the tooth within the socket before section.

Delivery

When all necessary bone removal and tooth section is complete, the tooth or root is delivered, usually by leverage with an elevator. When the root form is complicated, and there is marked curvature in more than one plane, withdrawal with forceps may be easier, provided that they can be applied. The successful delivery of the tooth is a cause of some satisfaction, and is usually greeted with relief by the patient, but this does not represent the end of the operation! The stages which follow are calculated to ensure trouble-free healing, and are just as important as those already completed.

Pathological specimens are welcomed by the oral pathology departments of most dental schools. They will provide suitable containers, advise on postal service rules on packing and despatch and report on specimens – usually without charge.

Clean-up

The socket, or other bony defect, should be examined for the presence of debris – pieces of enamel, amalgam, calculus or loose chips of bone all seem to delay healing until exfoliated. Soft tissue tags can be removed with discretion, although there is no evidence that they cause any harm. Excessive irrigation is unnecessary and washes away adherent clotted blood, which is the best dressing material available. Bleeding points may need to be clipped but, fortunately, significant haemorrhage is very rare and ligation, which is often extremely difficult, is seldom required. Persistent oozing will respond to packing with a swab, and to patience.

When bleeding is controlled, and the wound is clean, it is then ready for closure.

Sew-up

Most minor oral surgical wounds are sutured so as to replace the flap in the optimum position for healing. The object is not to pull the edges together to form a tight seal, but rather to support them in position and prevent displacement in the early phase of healing. Reducing the gape of the defect also serves to decrease the chance of ingress of food debris, and gentle traction on the tissues will hold them firmly to the bone surface and stop them bleeding. The fewer the number of sutures used to produce the desired result, the better. Insertion of too many sutures tears the tissue unnecessarily, and the resulting tangle of suture thread tends to accumulate plaque and promote inflammation. Suture ends should not be cut too short, but rather left tied in an accessible position for later removal.

Check-up

On completion of suturing, the tension of retraction should be released and the wound re-examined for any gaping. A short period of pressure, applied by biting gently on a damp swab, will ensure the final cessation of haemorrhage. During this time, the patient's postoperative instructions may be discussed. It is prudent to use a set of brief, printed instructions, since memory can be fallible under such circumstances, and a suggested format for an advice leaflet is listed in Appendix C. Patients must understand how to keep the wound clean, with frequent saline mouth baths, and know how to get help if they suffer haemorrhage, severe pain or excessive swelling. Proscription of mouth-cleaning or rinsing, or of taking fluids by mouth, or taking alcohol in moderation, or indeed of smoking is unkind and unnecessary as there is no evidence that any of these practices have the slightest effect on initial wound healing. Nevertheless, excess should (as always) be avoided. Suitable analgesics should be given, or prescribed, and sensible restriction of activity and rest at home overnight advised.

Follow-up

A return appointment must be made before the patient is discharged. Seven days is usually the most convenient interval, but postponement for a few extra days is of no consequence. Earlier review, except in response to problems, should be avoided as healing to the point of reasonable comfort usually needs this 7-day interval.

Write-up

Brief, but accurate, operation notes must be made to record the procedure used, and to note any variation from the usual technique. Involvement of significant vessels or nerves, an account of broken apices and the number of sutures inserted, are all particularly important. A dramatic description is unnecessary and it is best rather to concentrate on those factors most likely to be significant in the long-term follow-up. All such notes must, of course, be dated and clearly signed, since they constitute the legal as well as the clinical record of the operation.

4 Postoperative care

A wise oral surgeon once remarked, 'The operation is finished when the patient stops complaining.' For most patients, the follow-up is short and untroubled, but for a few the consequences can be lifelong.

At the time of suture removal, patients need, above all, to be assured that their progress is normal and that the residual discomfort, swelling or trismus are as expected. They should be encouraged to look forward to early improvement.

The appearance of the sutures is in itself a valuable indicator of the success of the patient's wound care. Accumulation of plaque and debris, with resultant inflammation, tells its own tale. By no means do all minor oral surgical wounds heal by first intention and, in most cases, there will be granulating areas and often small defects where food fragments can lodge. Swabbing with damp cotton wool and flushing with saline or chlorhexidine solution will clean up the area and leave it much fresher for the patient.

Premature removal of sutures is difficult due to swelling, and perhaps trismus, although it can be a relief to the patient if there is gross oedema and the sutures have been tied tightly. Convenient, and therefore comfortable, suture removal requires the same conditions as the original surgery – retraction, light, suitable instruments and skilled assistance. Many patients fear the procedure and they can really be reassured only by painless removal of the first suture. Scissors must be sharp right up to the points, and non-toothed tissue forceps are best for holding and withdrawing the cut threads. Even if sutures have not been inserted, it is essential that the progress of healing is reviewed at about one week post-operation, and the wound may benefit from irrigation or dressing. Large defects may be packed with iodoform ribbon gauze, which will stay fresh in the oral wound for some weeks. Smaller defects may benefit from regular flushing with a suitable syringe, and the patient may require instruction in this technique.

Most postoperative pain and swelling are due simply to surgical trauma and not infection, although bacterial contamination is inevitable at operation and thereafter. It is not logical to rely on antibiotics to compensate for surgical clumsiness, and they should only be prescribed in the following cases:

- where infection was present preoperatively
- where healing capacity is impaired
- where protection from bacteraemia is essential
- when surgical trauma is particularly severe.

Patients having teeth removed by surgical methods will not be immune from the occasional occurrence of a 'dry socket', but prescription of antibiotics should not be relied upon either to prevent or cure this distressing condition. Effective treatment requires irrigation, gentle packing with iodoform ribbon gauze and, most importantly, a generous prescription of potent analgesics. Nonsteroidal anti-inflammatory agents such as propoxyphen may have a specially effective role in such cases. If the pain persists, then packing with zinc-oxide/eugenol paste is justified as it does appear to relieve pain, albeit at the cost of prolonged wound healing and some local tissue necrosis.

Postoperative haemorrhage is unusual, especially if care is taken to ensure complete haemostasis before discharging the patient after the operation. In the unlikely event of a postoperative haemorrhage occurring, the surgeon must be available to give advice and help. In most cases, gentle pressure on the wound – achieved by biting on a damp cloth pack for 10–15 minutes – will compress the soft tissues on to the underlying bone and cope with the problem; sitting quietly and bed rest will also help. In more persistent or severe cases, the patient must return to the surgery for re-examination of the wound. It is important to reassure the patient, and their families, that the bleeding, while a nuisance, is not dangerous to their life or health.

When in the surgery, the requirements for effective treatment are the same as for the planned case, but they are more difficult to meet in the emergency situation, particularly outside normal working hours. The administration of local anaesthetic solution into the bleeding area is often

dramatically effective in arresting the bleeding by vasoconstriction. It allows proper examination of the wound and further suturing, or packing, to proceed without pain. The theoretical danger of recurrence of bleeding after the vasoconstriction passes off is met by the local measures, which will continue to exert their effect. Sutures should be placed to compress tissue at sites where grasping with tissue forceps reduces bleeding. A modest increase in suture tension is justified when the purpose is haemostasis.

Persistent oozing may respond to packing with oxidized cellulose gauze. This material forms a matrix for promotion of blood clotting and has no mechanical effect. Very rarely, a vascular bleeding point may be identified and clipped with a haemostat. Direct ligation of small vessels is very difficult to achieve, and a light binding suture around the tissue containing the vessel will usually be more feasible, and hence more effective.

Restricted mouth-opening for one or two weeks after third molar removal is so common that all patients should be warned to expect it. Persistence of the problem is usually associated with slow healing and prolonged inflammation, and will resolve when the underlying inflammatory stimulus is removed. In some cases, trismus persists for months, although it is never permanent. Some of these cases are examples of the rare problems that arise after inferior dental block injections, due either to haemorrhage or infection of the needle track. There is no effective treatment, and much patience is therefore required of the sufferer, supported by the surgeon. Relief, when it comes, tends to be rapid, and this lends weight to the suggestion that the mechanism is reflex inhibition of movement provoked by a painful stimulus.

Alteration of sensation in the area supplied by the mental or lingual nerve can follow surgery in the mandible. Pre-operative radiography may give a prior warning of this danger, and the operation may be modified accordingly, or even avoided, if the indication for surgery is weak. Flaps raised in the region of the mental foramen should be reflected far enough to identify the position of the nerve, rather than risk damaging it while working blind. If, despite these precautions, damage does occur, then careful assessment of the postoperative symptoms is essential. The extent and degree of alteration in sensation must be carefully recorded so that recovery can be monitored accurately. Generally speaking, those cases where some recovery is apparent in a few days will probably return to normal in a few months, but when there is more delayed recovery – or indeed no improvement by the end of 9 to 12 months – then no further progress can be expected. It follows, therefore, that patients must consent to the operation knowing the possibility of altered sensation, which occurs in up to 5 per cent of cases of third molar removal. Fortunately, only one in ten of these cases suffer from permanently altered sensation.

Sympathetic and thoughtful postoperative care not only benefits the patient, but also enables the surgeon to appraise critically the results of his work. This personal audit is the duty of every ethical clinician.