



Top tips for managing oral surgery complications in primary care

By Jennifer Sawyer,¹ Araz Ahmed,² Jim Carey,¹ Ewen McColl³ and Claire Moss⁴

Introduction

In previous oral surgery-related Top Tips, we have discussed measures to optimise oral surgery outcomes.^{1,2} Even when these tips are applied meticulously, surgical complications may arise and can present when least expected. Primary care clinicians may have to manage such complications during an often busy patient list, so in this short paper we discuss tips that clinicians may find useful in managing such complications.

Surgical preparation – anticipate the complication

‘By failing to prepare you prepare to fail.’³ Preoperative assessment and planning are crucial to the success of any surgical intervention. In identifying potential risks and complications preoperatively, they may be planned for and often mitigated.

Complications may be classified as pre-, intra-, or post-operative, or as surgical, medical, or patient-related. A thorough medical history, clinical exam and radiographic assessment should allow the dentist to anticipate and therefore minimise the risk of intraoperative surprises such as bleeding due to known coagulopathies, difficulty in surgical access, or challenging root morphology. Similarly, identifying those with marked dental anxiety or a history of difficult extractions will help to inform treatment planning. If a patient reports a history of excessive bleeding or challenging extractions it is wise to be mindful that history tends to repeat itself. Preoperative preparation is essential; ensure that all necessary (including potentially necessary) equipment and instruments are readily available. Make sure that you have surgical handpieces, luxating instruments, suture kits, haemostatic agents, etc readily available and this will significantly reduce intraoperative stress for you, your nurse, and your patient. Having a prepared oral surgery complication kit may save time and limit stress levels should any complications arise.

Consent

The consent process should bring together the patient’s presenting complaint, clinical findings, diagnosis, and the treatment options in a discussion with the patient. An acute condition may mean that some form of treatment is required on the day a patient presents, if safe to do so in the practice setting. The gold standard for routine and elective treatment is that patients should have a period of time to consider any treatment options discussed, along their associated risks and benefits. This means treatment is normally carried out at an appointment subsequent to that initial discussion. This is particularly important where the risk of a significant complication may be

anticipated. Surgical, medical, and patient specific risk assessment is key in the consent process. Those predictable or potential risks should be clearly identified so that both you and the patient are prepared to manage them should they arise. This in turn forms part of the informed consent process. Consider your patient holistically; for example, if their work is public facing, they may require more time away from that role after surgical treatment. Similarly, if they are about to jet off for a scuba diving holiday, it might not be the best time to remove an upper tooth with a significant risk of oro-antral communication.

It is wise to provide your patient with a clear post-operative care plan, in advance of any proposed treatment, including anticipated analgesic requirements, likelihood and probable duration of any trismus, bruising or swelling, and guidance on when and how to seek urgent or emergency assistance should it be required.

Risk assessment and management of common complications Root fractures/crown fractures

Often but not always predictable, we all recognise the distinctive ‘snap’ heard when a crown or root fractures during extraction. Should this occur, do not panic; stop, reassess, and plan your next course of action.

Risk factors: curved, bulbous, lengthy, or dilacerated roots, heavily restored and non-vital teeth, dense or sclerotic bone, cementoma, poor surgical technique.

Management: Identify known risk factors preoperatively. In the event of a coronal or root fracture, consider your visibility and access. If you are unsure what remains and where, consider an intraoperative periapical radiograph to reassess the situation. Consider whether the retained fragment is sufficiently small and pathology-free to be left *in situ* (<3 mm or the apical 1/3 of a root may be acceptable), or whether it requires retrieval. If you decide to retrieve the root remnant, consider the proximity of adjacent structures (such as the antrum, mental nerve, inferior alveolar nerve, implants), the access, visibility and your surgical competence. If lacking in the later, seek support from a colleague and include a basic surgical skills course in your personal development plan (PDP).

1. Ensure that you have good lighting and that you and the patient are positioned to optimise visibility and access. Surgery should be undertaken standing. Be prepared to move around your patient as you work to maintain optimal access and visibility throughout.
2. Ensure excellent local anaesthesia. Particularly if you’ve been struggling for a while, the local anaesthetic may be wearing off. ➔

¹Associate Professor/Honorary Consultant in Oral Surgery, Peninsula Dental School (University of Plymouth), Derriford Dental Education Facility, Plymouth Science Park, Research Way, Plymouth, PL6 8BT, UK; ²Clinical Lecturer, Peninsula Dental School (University of Plymouth), Derriford Dental Education Facility, Plymouth Science Park, Research Way, Plymouth, PL6 8BT, UK; ³Director of Clinical Dentistry, Peninsula Dental School (University of Plymouth), Derriford Dental Education Facility, Plymouth Science Park, Research Way, Plymouth, PL6 8BT, UK; ⁴Clinical Lecturer and Module Lead in Oral Surgery MSc, Peninsula Dental School (University of Plymouth), Derriford Dental Education Facility, Plymouth Science Park, Research Way, Plymouth, PL6 8BT, UK.

- 4. Top up the anaesthesia if necessary, bearing in mind the total dose administered.
- 3. Consider soft tissue access. Is a soft tissue flap required to visualise the retained fragment and or to access it? If raising a flap, ensure that it is a full thickness mucoperiosteal flap, remembering the principles of flap design. Within reason, a large flap will heal as well as a small one and will provide better access and visibility. A larger flap will have a better blood supply and be easier to retract than a thin finger of mucosa. This is particularly true for those who infrequently raise flaps.
- 4. If bony access is required, a flap must be raised, the soft tissues retracted and a gutter cut around the roots using a surgical handpiece (reverse exhaust, self-irrigating, high torque and excellent tactile feedback). Carefully run the bur vertically parallel and adjacent to the root (but not into the root), to form a gutter which will provide an application point and path of extraction. Be vigilant to protect adjacent teeth, soft tissues and vital structures. Soft tissue retractors such as a Minnesota, Bowdler-Henry rake, Lacks, and Kilner are essential to protect the soft-tissues at the operative site and to prevent trauma.
- 5. Once the tooth has been delivered, it can be tempting to immediately turn your attention to wound closure. However, meticulous debridement will reduce the risk of post-operative pain, infection, and bony sequestra. Ensure that the bone margins are smooth and that all debris including loose bone fragments have been removed. Irrigate the socket and under the flap, copiously, with sterile saline or water. Ensure that your assistant allows the saline to pool, helping any debris to float upwards, before aspirating it away. Repeat as required until the area is clean.
- 6. Reposition the flap and close with resorbable sutures (eg 4/0 or 3/0 Vicryl rapide is standard).
- 7. Confirm haemostasis before discharging the patient with a comprehensive post-operative care plan which includes adequate analgesia and emergency contact numbers. If there are concerns about the risk of post-operative complications, a review appointment or telephone call should be scheduled. Patients do feel well cared for if there is a follow up.

'If the risk of a sizeable OAC is considered very high, then it may be prudent to seek advice'

Oro-antral communication (OAC)

A hole into the antrum is a risk with some upper premolars and molars. These do not need to be intimidating if managed appropriately. If the risk of a sizeable OAC is considered very high, then it may be prudent to seek advice or specialist referral.

Risk factors: Lone standing upper molars, pneumatized antra, sclerotic bone, older patients, >50% of the root(s) overlying the antrum, discontinuity of the PDL space/lamina dura, poor surgical technique, presence of antral pathology (Fig. 1).

Management: Pre-operative risk assessment. If considered high risk, consider an elective surgical approach and design the flap such that it could be advanced in the event of an OAC.

If an oral antral communication is suspected, gently suction over the socket with good light to confirm if present. Never push

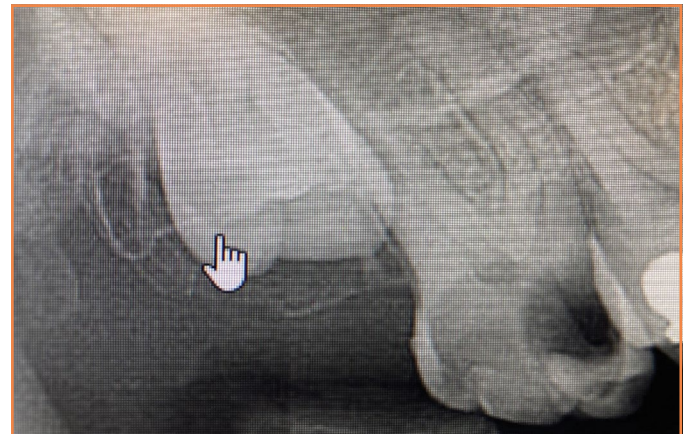


Fig. 1 Preoperative radiograph showing a grossly carious 17 adjacent to an unerupted 18. The antral floor appears to lie about halfway down the roots of the 17



Fig. 2 Extraction of the 17 and 18 with the tuberosity attached

the suction to the apical region or probe because this risks creating or enlarging a hole or rupturing intact sinus lining which would otherwise aid healing. Performing a Valsalva manoeuvre (a 'nose-blowing' test) is also now contraindicated for the same reasons. If you suspect but cannot confirm an OAC it may be prudent to advise the same post-operative behaviour as if there were an OAC (Fig. 2).

A communication ≤ 4 mm has a reasonable chance of healing on its own,⁴ if the patient follows the post-operative care instructions.

Ensure that there is a stable clot in the socket before discharging the patient with a follow up appointment and antral care instructions (no nose blowing and sneeze with mouth open for two weeks). Consider prescribing ephedrine nasal drops, for the affected side, and antibiotics.

If there is a larger OAC (≥ 5 mm) and, and you are skilled in the technique, you may wish to perform a buccal advancement flap to obtain primary closure. However, this should not normally be attempted unless you are clearly competent to do so, ie you should have enhanced skills or specialist training in oral surgery. In the event of a larger OAC, where you are not competent and confident to safely close it, a phone-call to your local oral surgeon/oral and maxillofacial surgeon will yield good advice on how best to manage and refer. These patients will normally need to be seen quite quickly. In some circumstances you may be advised to have a cover plate ▶▶



Fig. 3 Intra oral photograph of the 17, 18 OAC



Fig. 5 Three weeks post-operatively. OAC repaired at the time of surgery

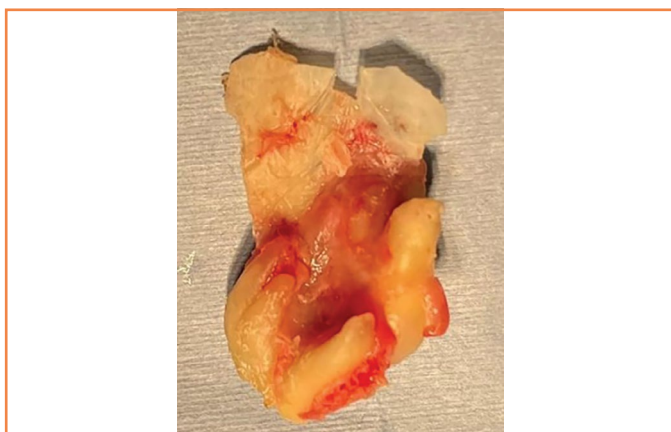


Fig. 4 17 and 18 with the tuberosity attached

◀ or suck-down splint made urgently by your local lab: these may be used as an emergency measure in cases where onward referral is required for definitive repair (Figures 3, 4 and 5).

Tuberosity fractures

Most tuberosity fractures can be avoided with careful planning and good technique. However, they can occur even with the correct technique.

Risk factors: Lone standing molars, older patients, pneumatised antra, ankylosed teeth, poor surgical technique.

Management: Consider an elective surgical approach, if within your competency, if the patient is deemed at high risk of fracture.

'In the event that you suspect a tuberosity fracture, stop and re-assess the situation'

In the event that you suspect a tuberosity fracture, stop and re-assess the situation. Small, insignificant fractures may be confined to the distal alveolus without involving the entire tuberosity or the antrum. Very small alveolar fractures may be safe to carefully dissect and remove with the tooth. A palatal mucosal tear is a clear sign of a tuberosity fracture and likely indicates a more significant fracture. If the tooth can be readily separated from the bone it may be appropriate to do so – unless it would form an essential part of

a splint. If the tooth cannot be readily separated from the bone, reposition and splint, either with composite and wire or with a suck down splint. Larger fractures involving the body of the tuberosity should be splinted and allowed to heal before the tooth is surgically removed, at a later date (>6 weeks later, often by a specialist). If you are unsure as to how to proceed, you should seek urgent advice from your local oral surgery team (Fig. 2).

Mucosal tears should be sutured and haemostasis ensured. If the fracture involves the antrum then an antral care plan should be followed (no nose blowing/sneeze with mouth open for two weeks, antibiotics, ephedrine). The patient should receive adequate analgesia and a follow up appointment.

Post-operative bleeding

Bleeding is often, although not always, predictable. Careful assessment and management will allow most bleeding to be readily controlled with simple measures. For those where bleeding is predictable due to medication, such as Direct Oral Anticoagulants ('DOACs'), and other antiplatelet or anticoagulant medications, follow appropriate guidance such as that issued by SDCEP.⁵

Bleeding is classified as primary (intra-operative), reactionary (within 24 hours, usually as the vasoconstrictor effect in the local anaesthetic is wearing off) and secondary (7–10 days post-operatively, often associated with infection).

Should a patient present with a post-operative bleed, it is therefore helpful to determine when the surgery took place and when they started to bleed.

Risk factors include anticoagulant or antiplatelet drugs, haemophilia, thrombocytopaenia, underlying bone marrow disease and severe liver disease (deranged clotting), injury to tissues and vessels intraoperatively.

Management: Hopefully at-risk patients will be identified preoperatively via a targeted history and appropriate measures can be taken to reduce the risk of significant bleeds. However, should a patient present with a post-operative bleed, the following is helpful:

1. Under good light and suction, identify the bleeding site, evacuating any large clots if necessary. Apply firm pressure to the bleeding site with damp gauze for at least ten minutes as timed by a clock. In the meantime, set up local anaesthetic with a vasoconstrictor (eg 2% ▶▶

4. lidocaine with 1: 80,000 adrenaline) for local infiltration, a suture set with 3/0 or 4/0 resorbable suture (eg Vicryl Rapide™), haemostatic agent (eg Surgicel, Gelatamp, or Hemocollagene, and many more).
2. If the socket is still bleeding, administer local anaesthetic, identify the bleeding site (bone/mucosa/vessel), place the haemostatic material of choice, and place one or more sutures (eg mattress suture) to constrict the mucosa over the bone margins and to hold the haemostatic agent *in situ*. Reapply a damp swab with firm pressure. It may be helpful to hold it yourself to ensure that consistent, firm pressure is applied. Re-check the socket after at least ten minutes. If bleeding has arrested, monitor the patient for at least another ten minutes to ensure satisfactory haemostasis.
3. If the bleeding is still not settling, call the local oral surgery or oral and maxillofacial surgery department for further advice. The patient may require further investigations and advanced support.

Post-operative pain

All patients should be advised regarding appropriate and adequate post-operative analgesia. Most simple extractions and paediatric patients can be managed with simple analgesia such as paracetamol and ibuprofen.⁶ These work well together when given at therapeutic doses. Post-operative pain is best controlled by administering analgesia before the local anaesthetic wears off and if taken regularly for the first 48 hours.

Options for analgesia in primary care include: paracetamol, NSAIDs such as ibuprofen, opioids (dihydrocodeine) or over the counter co-codamol. Patients requiring high or increasing levels of analgesia should be re-assessed clinically to determine the cause of pain (swelling, infection, alveolar osteitis). In secondary care codeine or tramadol may be prescribed for those undergoing more extensive procedures, in addition to appropriate simple analgesia.

Never underestimate the power and relief to the patient of providing a local anaesthetic block +/- infiltration, especially of one of the longer acting local anaesthetics (eg bupivacaine 0.5%), to help break the pain cycle and allow time for the oral analgesics to take effect.

Pre-warn patients with known TMD or chronic pain syndromes that symptoms may worsen for a period post-operatively but should settle with time. This will alleviate worry for the patient and reduce the demand for additional appointments.

Alveolar osteitis (dry socket)

Dry socket is an all too familiar complication and, whilst often predictable, all patients should be warned of this risk, including those who are at higher risk of developing it.

Risk factors: Surgical extraction, mandibular extraction, difficult or traumatic extraction, smokers, female.

Management: Patients tend to present 3–4 days post-operatively with a history of worsening, severe, aching/throbbing pain that may radiate along the jaw. Analgesia may provide limited relief. The peri-socket mucosa may be inflamed and the socket devoid of coagulum. There is often food debris in the socket.

1. Offer local anaesthetic, many patients are happy to proceed without
2. Under good light irrigate the socket with sterile saline or water. A wide bore needle on a 20 ml syringe is effective, as is a Monoject type curved-tip plastic syringe. Continue to flush the socket until all debris is removed
3. Gently place a small volume of Alveogyl⁷ in the socket. Never pack it in

4. Re-discuss the post-operative care instructions, including analgesia, smoking cessation and emergency contact details. It is also not uncommon, with a severe dry socket, to need to re-irrigate the socket within a few days and reapply a dressing.

Conclusions

Complications following oral surgery procedures are regularly encountered, no matter your level of experience. Following these tips will hopefully assist clinicians in reducing the risk and managing such complications effectively in a primary care setting. However, always remember that you can stop and seek advice if you are encountering a situation beyond your clinical comfort zone. ■

Top tips are intended as a series of experiential tips, rather than a compendium of the evidence.

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