



Review Article

Complications in exodontia

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ABSTRACT

All surgical procedures pose risk of complications. Exodontia, essentially being one, comes with the need to judiciously practise all precautions and carry out proper aseptic measures to reduce the risk of complications. The aetiology of postextraction complications can be vastly correlated to patient's medical history, habits, type of intervention and surgical site. This article aims to study few of the common complications of exodontia and the possible treatment and prevention of the same.

Literature was selected through search of literature reviews, case reports and standard books for oral and maxillofacial surgery. No restrictions were posed regarding year of publication.

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1. Introduction

Exodontia is one of the oldest and common surgical procedure that dentists and oral surgeons carry out. The indication for extraction may include cysts, granulomas, failed Endodontic treatment, non-restorable caries, residual roots, periodontal disease, systemic disease having periodontal/ oral manifestations, phlegmon etc. Extractions can also be a part of orthodontic and prosthodontics treatment plan. Although being a common procedure, extractions if done incorrectly or with disregard to the basic principles can lead to a wide range of complications which can become difficult to manage or possibly fatal.¹ These should be recognised by the surgeon early on and treated in their incipency.^{2–4}

There can be immediate complications such as failure to secure local anaesthesia, thermal injury, fracture of mandible, dislocation of temporomandibular joint, fracture of tooth root, slipping of tooth into the maxillary sinus, collateral damage to surrounding soft tissues, aspiration

of tooth or lodgment of tooth into the pharynx., or late complications like osteoradionecrosis, osteomyelitis, chronic pain, trismus and alveolar osteitis.

Prevention is possible by following basic principles of extractions, proper aseptic measures and sterilisation, proper pre-surgical and post-surgical instructions given and the same followed by patient.

2. Discussion

2.1. Classification

2.1.1. Preoperative

1. Difficulty in achieving anaesthesia
2. Complications associated with medical history
3. Difficulty in access

2.1.2. Intraoperative

These can include

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2.1.3. Postoperative

Dry socket/alveolar osteitis: Alveolar osteitis or dry socket is the most common postoperative complication following extraction of teeth. This term was first described by CRAWFORD in 1986.⁵ Several other terms have been used for this condition such as localized osteitis, postoperative alveolitis, alveolalgia, alveolitis sicca dolorosa, septic socket, necrotic socket, localized alveolitis and fibrinolytic alveolitis. It can be associated with foul taste and halitosis. The pain is described to be severe, debilitating and persistent and reaching peak post 72 hours. The incidence of alveolar osteitis is seen to be more with mandibular teeth extractions than maxillary. AO may affect women in ratio of 5:1 with respect to males.⁵ AO is developed 1 to 3 days after tooth extraction and lasts for about 5-10 days.

Several contributing factors may include: age, surgical trauma, smoking, oral contraceptives, lack of post-operative care, systemic disease, dislodgement of the clot, root fragment remaining in the socket, vasoconstrictor in LA, excessive irrigation/ curettage etc.

Prevention and treatment includes: Antibiotics such as erythromycin, clindamycin, metronidazole and penicillin, chlorhexidine mouth rinse, eugenol based packs/dressings, topical steroids (hydrocortisone + tetracycline), low level laser therapy (LLLT), oxidised cellulose foam (OCF) and topical haemostats. It is found that immediate packing of extraction socket with filament gauze that contained 9% eugenol, 6% balsam of Peru, and 55% petroleum jelly reduces the incidence of dry socket.⁶ Studies reported substantial reduction in the incidence of AO following treatment of the extraction site with PRP and or combination of PRF and gelatin sponge.^{5,7-9}

Haemorrhage: days post-op, rare, caused due to infection which destroys the blood clot). It may have local aetiologies like trauma, infection, laceration, clot dislodgement, application of heat, friable granulation tissue etc. or systemic aetiologies like coagulopathies, hypertension, leukemia, anti platelet drugs, uraemia, kidney dysfunction, multiple myeloma, lupus erythematosus etc. A proper record of medical history will reduce the chances of haemorrhage greatly. If a patient comes back with haemorrhage, his general conditions and vitals are then efficiently assessed. Generalised oozing can be managed by applying pressure. Operative measures like careful handling of the tissues to avoid unnecessary trauma are to be taken.³ Monitor vitals for the sign of hypovolemia periodically.³ The patient's mouth should be washed out with cold water and the adherent clot is to be removed with a gauze swab.³ If manual pressure fails to control bleeding, it is to be assumed that the bleeding is originating from the bony cavity and is to be managed with a haemostatic agent or a socket pack like whitehead varnish on gauze. If a large vessel is involved, it is to be managed by ligation.⁵⁻¹⁰

Trismus: Trismus can be a common preoperative complication which makes surgery effectively difficult to perform due to very limited access to surgical site. Post-op, it can be due to post-op oedema, inflammation of soft tissues or hematoma formation. It can also be caused due to trauma to medial pterygoid or needle injury to spenomandibular ligament during pterygomandibular block. Damage to temporomandibular joint due to excessive downward pressure or keeping the patient's mouth wide open for a longer period, or infection in pterygomandibular space and or in sub-masseteric space can also lead to trismus.² It usually recovers with time (6-8 weeks). However, physiotherapy, heat application, short wave diathermy, muscle relaxants etc., can prove to be helpful.

Postoperative swelling and pain: Swelling is generally caused by poor operative techniques, trauma to soft tissue by burs, blunt instruments, tightly placed sutures or surgical trauma.

If the patient describes rapid onset of swelling that is hard, then this is usually a hematoma. If swelling is of delayed onset, but is persistent, hard and painful, then there is often a collection of pus, which can be very painful with raised skin temperature along with redness of the overlying tissues and presence of fever.⁶

Non-steroidal anti-inflammatory drugs (NSAIDs) and paracetamol (acetaminophen) are used for pain management along with cold compress for swelling. Cold compress can reduce swelling by facilitating vasoconstriction and ease the pain.

When swelling has reached its maximum (usually after 24 to 48 hours), heat, in the form of moist compresses, should be applied. This leads to vasodilatation with increased circulation which causes rapid removal of tissue breakdown products, and greater influx of defensive cells and antibodies.^{6,10-19}

Dislocation of temporomandibular joint: This is usually caused by lack of support to mandible during extractions. To minimise this complication, the operators non-dominant hand should ideally stabilise the jaw during instrumentation. If dislocation occurs it should be reduced immediately.² To reduce the dislocation, the operator stands in front of the patient and places his thumbs intra orally on the external oblique ridges lateral to any mandibular molars which are present and his fingers extra orally under the lower border of the mandible.² The patient is to be advised to not open their mouth wide or avoid yawning to whatever extent possible for a few days until recovery.

Acute osteomyelitis of jaw: Osteomyelitis is inflammation of the marrow and bone cortex caused usually after a chronic infection. Extractions done in the presence of infections like pericoronitis can lead to osteomyelitis. Patients with habits like alcohol, tobacco, drug addicts are greatly susceptible. Malignancies, malnutrition, use of corticosteroids, cytotoxic drugs, immunosuppressive

drugs can also predispose to osteomyelitis of jaw post extraction. Treatment methods can be incision and drainage, hyperbaric oxygen therapy, decortication, saucerisation, sequestrectomy, resection of the jaw and broad-spectrum bactericidal antibiotic like amoxicillin (500 mg, 8 hourly) and flucloxacillin (250 mg, 6 hourly) may be preferred.² Some clinicians advocate the use of clindamycin (300 mg, 6 hourly) because of its ability to diffuse widely in bone.^{2–10}

Surgical emphysema: It is entrapment of air in the tissue spaces through extraction spaces which forms a swelling and has a characteristic crackling on palpation. It is caused by increased air pressure in the oral cavity. Trumpet players are largely susceptible. The condition usually settles on its own without treatment as the air is slowly absorbed.

Osteoradionecrosis of jaw: Osteoradionecrosis (ORN) was first described by Marx in 1983 as hypovascularity, hypocellularity and local tissue hypoxia.³ Patients with history of head and neck irradiation are susceptible to osteoradionecrosis. The prevalence of ORN ranges from 0.9% to 35% among head and neck irradiated patients and is 3 times more frequent in men than in women. When bone exposure is evident, and the clinical presentation is consistent with ORN, imaging is warranted to assess the extent of the disease and its impact on the surrounding vital structures, and on the integrity of the jaw.¹⁹ Careful panoramic or IOPA evaluation of the site in question is advised to avoid occurrence of ORN. Notably, widening of the periodontal ligament space along the mandibular tooth roots is a common finding in the irradiated mandible, and in the absence of adjacent bone destruction, it requires no management.¹⁹ The condition is treated by hyperbaric oxygen therapy (The Marx's protocol for ORN is a 90-minute session at 2.4 atmospheres, once a day for 30 days pre-op and 10 days post-op. For prevention, the protocol is daily sessions for 20 days pre-op and 10 days post-op). It is also treated with antibiotics, analgesics and by surgical approaches like segmental resection of bone.¹⁰

3. Post Operative Advices

1. (a) Application of saline soaked gauze is placed in the patients mouth and asked to bite on for approximately an hour to achieve adequate haemostasis.
- (b) Application of cold compress post removal of gauze, intermittently for the first 24 hours is advised. This induces vasoconstriction and prevents formation of oedema.
- (c) The patient is advised against spitting for minimum of 12 hours post surgery as it creates negative pressure and may prolong bleeding.
- (d) Soft diet is advised to avoid trauma to the site. If the procedure is limited to one side, the patient is advised to chew on the non-operated site.
- (e) Chewing is preferably avoided until action LA subsides.

- (f) The patient is advised against brushing only for the first 24 hours as it may induce haemorrhage. Post 24 hours proper oral hygiene practices with soft brush or foam pads is advised along with chlorhexidine mouth rinse. Good oral hygiene promotes rapid healing.
- (g) Patient is advised against use of smoke/smokeless tobacco which interferes with wound healing. Patient is also advised against alcohol as it dilates blood vessels and interfere with protein metabolism which may cause post-op bleeding and increased chances of infection respectively.
- (h) The patient is advised to take adequate rest and avoid strenuous exercise for the first 12-24 hours to avoid increased circulation which may result in bleeding.⁶

4. Conclusion

The occurrence of complications in exodontia from time to time is common and sometimes inevitable. However, with proper armamentarium and technique, as well as with adherence to proper instructions given to patients, they can be avoided or reduced largely. The clinician must possess the clinical acumen to recognize impending complications and manage them accordingly.

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6. Conflict of Interest

None.

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