

## Review Article

# A Critically Discussion and Evaluation of the Systemic and Local Complication of Exodontia

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## Introduction

Exodontia is a popular surgical procedure under Oral and Maxillofacial Surgery and like any other surgical operations, is not void of complications which are often unforeseen and unanticipated under normal, ordinary circumstances. Though dictums have been spelled out regarding the prevention of the occurrence of complications during and after tooth extraction, most dentists have not yet managed to avoid them, leaving the argument to the test of time. Thus, it is crucial and imperative for clinicians to be aware and be able to identify and recognize the spectrum of complications early and understand their implications in a timely manner as their occurrence results in prolonged treatment phases which may ultimately be cumbersome to both the patient and clinician [1]. Slight deviation from surgery's basic principles promotes relative chances of complications occurring significantly. Similarly, medical compromise by patients that fail to take due precautions after exodontia increase the likelihood of the precipitation of complications although they still can occur in spite of employing effective, medical precautions and care. For a clinician therefore, prior knowledge and exposure to the factors underlying exodontia complications will necessitate him or her to adopt comprehensive approaches towards the prevention, management and treatment of tooth extraction complications.

Complications can occur during anaesthesia and are referred to as anaesthetic complications while those occurring in the process of tooth extraction are regarded to as perioperative or intraoperative complications and those occurring after tooth extraction/ surgical process are known as post-operative complications. The complications are further categorized into local and systemic complications whereby the former entails immediate, delayed and late complications. This paper seeks to explore various systemic and local complications of tooth extractions and afterwards provide clinical strategies that ought to be utilized in assessing, managing or preventing the complications from occurring.

## Pre-Operative Complication

Before or during patient admission for tooth removal, assessment of the patient is vital. Patient history is paramount in order to plan

for the best procedure and to be prepared for any risks that may occur during tooth removal procedure. In addition it is of great important to know the patient bleeding history any severe reaction to anaesthetics. The main objective of pre-operative is to identify and correct any anomalies' that are correctable.

Complication arises when the patients are administered with anaesthesia without getting the clear history of the patients. Allergic reactions, dentition, the airway and concurrent illness. Preoperative complication are characterised by allergic reaction to anaesthesia, damage of teeth during instrumentation of the airwave. More also, respiratory and cardiac diseases condition usually worsen if not checked.

## Treatment and management

Evaluation and assessment of patient is vital in order to manage, treat and avert ant complication. Also, proper planning especially on patients with cardiovascular will minimize risks during surgery.

## Anaesthetic (Perioperative) Complications

Dental extraction entails the removal of a patient's tooth by cutting into one's oral tissue, a process that is often accompanied with excessive pain. To diminish the pain during the surgical process of extraction, clinicians use anesthetics, in which local agents are injected into the patient's tissue to numb the nerves. However, some dentists prefer to use nitrous oxide, a gas which diminishes the consciousness of the patient to reduce pain during the extraction process. Conceptually, the use of anesthetics is accompanied with various, occasional complications including failure to take effect, breaking of the needle, pain at injection, allergic reaction because of hypersensitivity, and over dosage resulting to high levels of toxicity. Breakage of the needle during anaesthesia has been experienced as a complication over time because of needle re-usage and utilization of very narrow needles with alloy weakness [2]. Clinical strategies to avoid the complication entail avoiding re-usage of needles, checking of needles for any deformations before use and localising a hypodermic needle piece by using metal detectors, ultrasonography, 3-D CT-scans and electromagnets along with general anaesthesia [3].

Pain at injection on the other hand can be cause by high injection pressure and fast injection which may result in tissue swelling and pain. Intraneural or intramuscular injection may also result in inadequate injection sites while pain preceding intramuscular injection is attributed to inflammation or fibrosis in the patient's muscles. To avoid injection pain, clinicians should embrace slower injection as aggressive needle insertion tears blood vessels, periosteum, soft tissues and nerves causing pain or post-operative complications [4].

Hypersensitivity and allergic reactions to local or general anaesthetics are quite rare with causal factors like presence of adrenaline or fear to dental extraction [5]. Intra-oral and skin tests

can be conducted to determine real allergens, helping patients avoid such agents [6].

Lack of anaesthetic effect is due to pathological, anatomical, psychological reasons as well as poor injection techniques and this can be managed or prevented by using sedatives like benzodiazepines, avoiding inferior injection of mandibular foramen and the use of direct needle insertion techniques that entails inserting the needle medially to the patient's pterygomandibular raphe [7].

## Local (Post-Operative) Complications

Under local complications, immediate, delayed and late complications are outlined as indicated below:

### Immediate complications

**Fracture of the mandible:** A fracture can be defined as a break in a bone's continuity. This complication is not common but it occurs in few cases. The above fracture occurs in the jaw's angle as well as in the premolar region.

Fracture of the mandible is commonly caused by:

1. Osteomyelitis
2. Unerupted teeth
3. Irradiated mandible
4. Fibrous dysplasia
5. Use of excessive force during teeth extraction
6. Atrophic mandible
7. Senile osteoporosis

The above complication can be managed by:

Referring the cases to specialists in oral surgery centre and not attempting the surgeries in dental clinics.

Extraction and bandage should be applied.

Avoid use of excessive force during teeth extraction by first examining the reason why it is resistant and come up with remedies.

**Loosening or extraction of adjacent teeth:** This form of complication though common it is an avoidable one, provided enough and sufficient care is upheld in the use of elevator and forceps. This mostly occurs when a tooth is manipulated or utilized as the fulcrum during the application of the elevator as well as poor visibility which comes as a result of accumulation of blood. As a result of this accident, the tooth undergoes luxation forcing it to be fitted back into its normal position and tied using a strong wire to its adjacent teeth.

The above complication can be managed by:

Forcing the luxated tooth back to its original position by applying heavy thumb pressure.

Ligating the tooth into its normal position.

In case the tooth has been completely extracted, it should be replanted immediately and splinted to the adjacent tooth. In addition, the replanted tooth should be relieved from biting function to avoid opposing teeth grinding each other. Finally, there should be adequate

postoperative instructions as well as a daily follow up

**Dislocation of the mandible:** This refers to the dislodgement between the glenoid fossa and the condyloid process leading to dislocation of both joints because of the much pressure applied. Symptoms of this complication include inability of the patient to close her/his mouth as well as a visible depression in the anterior region of the ear. Treatment of this complication entails reducing the dislocation by the specialist wrapping his thumbs round the gauze as a protection against any injury that may come up as a result of quick closure of the mouth. Thumbs should be placed on the occlusal region of the mandibular molar while applying backward and downward pressure.

**Fracture of the tuberosity of the maxilla:** This usually occurs when attempting to extract the third maxillary molars and in most cases when such tooth is firmly attached to the bone. The operator finds himself holding a large part of that bone which is in most cases attached to the mucoperiosteum. This complication can be caused by isolated tooth. Malposed tooth as well as ankylosed tooth.

The complication can be managed by removing the bone fragment and the tooth after conducting fragment excision, more especially if the tooth is small. Additionally, drainage should be facilitated especially if the maxillary sinus is exposed, flaps trimmed as well as sutured and reopposed. In case the fragment is large and accommodates more than a single tooth, reposition and fixation using a suitable splint as well as the tooth which ought to be removed later by dissection of the tooth.

**Gingival laceration:** This result from misapplication or slipping of the instruments used during extraction as well as the gum remaining attached to the tooth during its delivery from its respective socket. In such cases the tooth is carefully dissected and the gum carefully attached with a scalpel before making any more efforts to return the tooth. The lacerated gum if not sutured back to place, it is likely to cause haemorrhage.

### Delayed complications

**Hemorrhage:** Hemostasis and excessive bleeding during tooth extraction frequently occurs in patients who may have no pathology in hemorrhage tendencies. Bleeding is often experienced at the time of surgery or primary hemorrhage that occurs within few hours after surgery. This is normally caused by the vasoconstriction of the blood vessels that are damaged before surgery the patient information about any blood history of bleeding excessively, should be obtained especially on previous bleeding incidences during tooth extraction [8]. If the patient is suspected to have hemorrhagic diathesis, they should be further investigated by the hematologist. Excessive bleeding is majorly caused by the following diseases:

Platelet deficiency; this is caused by rapid platelet destruction, or failure of production. Secondly, blood clotting abnormally, for example hemophilia, which is caused by complication of coagulation of blood. Lastly, blood vessels abnormally may lead to excessive bleeding.

Hemorrhage may become a problem during tooth extraction thus it is important to have suction apparatus that are in good condition in order to clear operative field and enhance clear vision during extraction [9]. Control of soft tissues from bleeding can

also be achieved through injecting anesthetic solution which has vasoconstrictor that significantly reduce tissue bleeding in addition placing a small oxidized cellulose gauze in the superficial area of the socket stabilizes the formation of blood clot in the site. Bone wax can also be smeared in the bone marrow spaces if the cancellous bone persist in oozing blood is persistent [10].

**Management of hemorrhage after teeth extraction:** Treatment and prevention of psychogenic shock, which is caused by fear, is essential. The dentist should practice calm attitude when receiving a patient. This can be done by constantly assuring the patient that the condition is under control [8]. Placing of the patient in apposition that facilitates cerebral circulation is crucial in reducing hemorrhage thus quick recovery.

Diagnosis and finding the causes of hemorrhage; the cause of the bleeding should be known and examining the tendency of blood to clot. Examining the patient to determine the actual source of bleeding should be done by clearing the mouth and checking of the bony sockets, lacerated tissues, or inferior dental canal.

Patients who exhibit coagulation disorders should be hospitalized for treatment. Suturing of soft tissue laceration should be done if bleeding is from soft tissues, if caused by interference of formed clot use of pressure packs should be employed in addition to post-operative measures.

**Localized osteitis (dry socket):** Localized osteitis or dry socket describes faulty healing of the socket. This condition is characterized by painful sockets with bare bone and broken blood clot [10]. This is normally caused by infection on the apex of the tooth or trauma to the socket that surround the soft tissues and the bone. Excessive and early use of mouthwash can also cause dry socket. Patients having systemic diseases such as diabetes and leukemia are prone to dry socket.

**Treatment:** Irrigation of dry socket with warm saline and removal of degenerated blood clots. The sharp bones should be smoothed using a bone file or using rongeur forceps to excise them. Zinc oxide and olive cloves can be used as loose dressing for dry socket in addition to the prescriptions of antibiotics and sedatives [8].

**Trismus:** Trismus is the inability of a patient to open the mouth due to mouth spasm. This condition is caused by inflammation of the soft tissues, formation of hematoma, or post-operative edema. The treatment is usually done by hot saline mouthwash and administration of antibiotics [10].

### Late complications

**Acute osteomyelitis:** This is an infection that is intense on the bone, bone marrow and periosteum, which affects large bone area. It is often characterized by swelling, severe pain, tenderness pus may appear [11].

**Treatment:** The intra bone drainage is vital in its management. The sequestra removal should also be done in the treatment in addition to analgesic [1].

**Nerve damage:** Nerve damage usually affects three areas: the mental nerve, which is normally caused by overextension of relieving incisions. Secondly, the inferior dental nerve that comprises the roots

of the third molar, which may be damaged during posterior extraction and lastly the lingual nerve, which may be damaged during elevation to the lower third molar [8].

**Treatment and management:** Assurance and calming patient is vital in managing nerve damage. Administration of vitamins, for example vitamins B1 and B12. Nerve decompression can also be done where necessary [12-15].

### Conclusion

In conclusion, Exodontia is not void of complications often unforeseen and unanticipated under normal, ordinary circumstances. It is crucial and imperative for clinicians to be aware and be able to identify and recognize the spectrum of complications early and understand their implications in a timely manner as their occurrence results in prolonged treatment phases which may ultimately be cumbersome to both the patient and clinician. For a clinician therefore, prior knowledge and exposure to the factors underlying exodontia complications will necessitate him or her to adopt comprehensive approaches towards the prevention, management and treatment of tooth extraction complications.

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