Fortune J Health Sci 2020; 3 (3): 135-147 *DOI: 10.26502/fjhs014*

Review Article

A General Overview of Post Extraction Complications-Prevention, Management and Importance of Post Extraction Advices

Ahana Goswami[1*], Tanmoy Ghorui[2], Rajarshi Bandyopadhyay[2], Anupam Sarkar[3], Amit Ray[4]

[1]Intern, Gurunanak Institute of Dental Sciences and Research, Kolkata, West Bengal, India

[2]Senior Lecturer, Department of Oral and Maxillofacial Surgery, Gurunanak Institute of Dental Sciences and Research, Kolkata, West Bengal, India

[3]Lecturer, Department of Oral and Maxillofacial Surgery, Gurunanak Institute of Dental Sciences and Research, Kolkata, West Bengal, India

[4]Professor and Head of the Department, Department of Oral and Maxillofacial Surgery, Gurunanak Institute of Dental Sciences and Research, Kolkata, West Bengal, India

***Corresponding Author:** Ahana Goswami, Intern, Gurunanak Institute of Dental Sciences and Research, Kolkata, West Bengal, India; E-mail: agoswami3108@gmail.com

Received: 05 October 2020; **Accepted:** 16 October 2020; **Published:** 22 October 2020

Citation: Ahana Goswami, Tanmoy Ghorui, Rajarshi Bandyopadhyay, Anupam Sarkar, Amit Ray. A General Overview of Post Extraction Complications-Prevention, Management and Importance of Post Extraction Advices. Fortune Journal of Health Sciences 3 (2020): 135-147.

Abstract

Exodontia is essentially a surgical procedure and warrants all the judicious precautions and the aseptic care to prevent complications. Whenever the basic principle of surgery is violated, the relative chances of developing complications are increased significantly. Complications are multifactorial and are correlated to either to the patient's health status or habits or to systemic and local factors. Post extraction complications can be delayed complications or late complications. A careful analysis of patient's medical history, proper surgical technique and the correct instructions in the post surgical behaviour prevent the insurgence of intra and post operative complications.

Keywords: Extraction; Haemorrhage; Swelling; Trismus; Dry socket; Oro-antral fistula; Paraesthesia

Introduction

Complications following extraction of teeth can be serious and sometimes fatal [1]. The surgeon should recognize these conditions early and treat them in their incipiency [1]. Post extraction complications can be immediate complications like failure to secure local anaesthesia, failure to remove the tooth, fracture of tooth or root, fracture of the alveolus (including maxillary tuberosity), oro-antral communication, displacement of tooth or a root into the adjacent tissues, aspiration of the tooth or part of a tooth into the pharynx, collateral damage to surrounding soft tissues, thermal injury, bleeding, dislocation of temporomandibular joint, fracture of mandible, damage to nerve; or delayed complications like excessive pain, swelling, trismus, localized alveolar osteitis, acute osteomyelitis, infection of soft tissues, oro-antral fistula, failure of the socket to heal; or late complications like chronic osteomyelitis, osteoradionecrosis, nerve damage, chronic pain [2]. After the surgical procedure has been completed, patients should be given proper instructions to manage and control the typical post operative sequel [3].

Discussion

Post Extraction Complications

Haemorrhage

Bleeding from an extraction socket is the most common post operative haemorrhage encountered by the dental surgeon [4]. Bleeding may be continuation of primary, reactionary (occurring within 48 hours of the operation when the effect of the vasoconstrictor in Local anaesthesia wears off and there is reactive hyperaemia) or secondary haemorrhage (a rare complication of tooth extraction which may be due to infection which destroys the blood clot. It starts about 7 days after operation) [5,4]. Bleeding may be due to some local causes like trauma, laceration, friable granulation tissue, clot dislodgement, infection, hemorrhagic lesions, violent exercise, application of heat, coughing or may be due to some systemic causes like coagulopathies, anticoagulant therapy, anti-platelet drugs, liver dysfunction, chronic liver failure, uraemia, Lupus Erythematosus, steroid therapy (prolonged), Multiple Myeloma, Leukaemia, Hypertension, Thrombocytopenia [2]. Proper pre operative measures like family history, past dental history like history of bleeding, past medical history like platelet disorders associated with liver disease or hypertension, drug history such as whether the patient is on oral anticoagulants are required [2,6]. Peri-operative measures like careful handling of the tissues to avoid unnecessary trauma are to be taken [2]. If a patient comes back with haemorrhage, his general condition is then rapidly assessed [5]. Monitor vitals for the sign of hypovolemia periodically [2]. The patient's mouth should be washed out with cold water and the adherent clot is to be removed with a gauze swab [4]. Generalized oozing from the soft tissues usually can be arrested by manual pressure or a gauze pack placed over the area [1]. Tannic acid powder can also be placed to control bleeding [6]. Sutures may be placed across the socket [5]. If such pressure fails to control the blood flow it is obvious that the source of haemorrhage originates within the bony cavity and some sort of socket pack is required like Whitehead's varnish on ribbon gauze or some absorbable haemostatic agents such as gelatin sponge or surgicel or bone wax may be applied over the site of

haemorrhage, or the bleeding vessel can be compressed by crushing the overlying bone with a blunt instrument [1,4,6]. If a large vessel is involved, vessel ligation is required [1]. The patient should receive supportive treatment including warmth, administration of fluids by mouth, drugs to relieve anxiety and pain, Intravenous (IV) administration of crystalloids (Ringer's lactate), colloids (Hexastarch solution as plasma expander), IV calcium gluconate injection, and Vitamin K and C [2,5].

Hematoma and Ecchymosis

Postoperative hematoma formation is due to inadequate postoperative haemostasis or lack of drainage [4]. It may be due to over-tight suturing of the wound which may result in a considerable facial swelling which is tender on palpation [4]. The condition is usually present on the first post operative day [4]. Hematoma is treated by removal of one or more sutures and evacuation by aspiration with a sterile wide bore needle along with prescription of hot saline mouth bath and suitable antibiotic therapy [4]. Mild ecchymosis will be seen after most surgical extractions, especially in elderly patients with increased capillary fragility and poor tissue elasticity [1]. Ecchymosis and hematoma are treated with intermittent ice packs (30 minutes per hour) for the first 24 hours after surgery, followed by intermittent hot moist packs [1]. Patient should be informed that the discolouration is from the accumulated red blood cells and the subsequent breakdown of the haemoglobin may take several weeks to disappear completely [1].

Post Operative Pain

Post extraction pain may result from incomplete extraction of the tooth, laceration of the soft tissues, exposed bone, infected sockets or damage to adjacent nerves [5]. Treatment is by eliminating the cause and by prescribing analgesic drugs [5]. Some avoidable causes of postoperative pain are swelling, trismus and trauma [6].

Swelling

Swelling is caused by poor surgical technique, use of blunt instruments, pulling on the flaps to gain access and inadequate drainage, entangled burs in the soft tissues, tightly placed sutures or surgical trauma [1,5]. If the patient describes rapid onset of swelling that is hard, then this is usually a hematoma [1]. 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 [1,7]. Inflammatory oedema can be minimized by following the aseptic principles, gentle tissue handling, judicious bone cutting and use of coolant, proper irrigation and removal of necrotic debris and food particles, loosely placed sutures, application of external hot moist packs for 30 minutes per hour, use of warm isotonic saline mouth rinses every 3 to 4 hours, and antibiotics [2]. If fluctuation is present, then pus should be evacuated prior to the institution of antibiotic [6]. Paracetamol and Nonsteroidal anti-inflammatory drugs (NSAIDS) are prescribed for pain control which may be used in combination with opioids or corticosteroids [8]. Corticosteroids, antibiotics, antibacterial mouthwashes like Chlorhexidine, topical gels containing antimicrobial agents, and cold application are preferred treatment options [8]. Reduced temperature causes vasoconstriction and reduces post operative swelling [8]. It can also reduce nerve conduction velocity resulting in an analgesic

effect [8]. Pressure dressings are also beneficial in limiting post operative swelling [1]. Once swelling has reached its maximum (usually after 24 to 48 hours), heat, in the form of moist compresses, should be applied [1]. This leads to vasodilatation with increased circulation which causes more rapid removal of tissue breakdown products, and greater influx of defensive cells and antibodies [1]. Various enzyme and hormone preparations have been suggested for the treatment of postoperative swelling [1].

Trismus

Trismus or inability to open the mouth due to muscle spasms may complicate oral surgical procedures, particularly difficult dental extractions [6]. It may be caused by postoperative oedema, hematoma formation, or inflammation of the soft tissues [6]. Trismus can also be caused due to needle injury to the sphenomandibular ligament during the pterygomandibular block [2]. An inferior dental block injection may be followed by a painless, severe and progressive trismus without swelling, due to either hematoma formation (which may undergo fibrosis), caused by penetration of a small blood vessel or introduction of infection, or due to trauma to the medial pterygoid muscle causing spasm [2,5,6]. 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 submasseteric space can also lead to trismus [2,5]. Intra-oral application of heat by the use of short wave diathermy or the use of hot saline mouth baths, analgesics, antibiotics, muscle relaxants, application of glycerine magnesuium sulphate dressing, physiotherapy or surgical decompression are few methods to improve trismus [2,5,6]. It will recover with time, usually 6 weeks but may be improved more quickly by gently opening the mouth under general anaesthesia [5].

Trauma

Post operative pain may be caused by avoidable trauma during oral surgical procedures [6]. Bone may be bruised by clumsy instrumentation or damaged by overheated burs during bone removal [6]. Faulty or careless handling of instruments may result in damage to other organs [5]. Careful avoidance of these errors in technique combined with meticulous attention to smoothening of sharp bone edges and socket toilet may eliminate the cause of after pain [6]. Oral antibiotics and analgesics are prescribed to control the acute phase of the condition [9].

Dry Socket or Alveolar Osteitis

It is defined as postoperative pain at the extraction site increasing in severity at any time between 1 and 3 days after extraction accompanied by a totally or partially disintegrated clot of blood within the alveolar socket with or without halitosis [10]. It is the most common local complication after surgical removal of tooth and often multifactorial [10]. The frequency of dry socket varies between 1 and 4% of all tooth extractions and can reach up to 20 to 30% in third molar surgeries [10]. Clinically, there is necrosis and disintegration of the originally formed blood clot, empty alveolus, covered by greyish yellow layer of detritus and necrotic tissues and very sensitive bone surfaces [10]. There is severe, persistent throbbing pain in and around the extraction socket radiating in different adjacent parts and organs which usually occurs 2-3 days after tooth extraction and can last several days to weeks that is not easily relieved by

analgesics [10,11]. The exact etiology is not well understood [12]. Birn suggested that the etiology of dry socket is increased local fibrinolysis leading to disintegration of the clot [12]. Birn hypothesized that trauma during an extraction or the presence of a bacterial infection somehow facilitates the release of plasminogen tissue activators in the post extraction socket, resulting in the plasmin induction of fibrinolysis that dislodges the blood clot that is formed after the extraction and causing a dry socket lesion [13]. Risk factors associated with dry socket can be advanced age, female gender, usage of oral contraceptives, increased surgical time, smoking, traumatic tooth extraction, increased dose of anaesthesia, medical history like diabetes mellitus, operator experience, difficult and prolonged extraction, previous infection of the surgical site, poor oral hygiene, excessive repeated irrigation of alveolus, lack of compliance with post extraction instructions, gingivitis, periodontitis, site and number of extractions, bone or root fragments and debris remnants, vasoconstrictors in local anaesthetic solutions, drugs like antipsychotic and antidepressant drugs, design of flap, food particles and bacterial bio film [6,12-19]. Use of 0.2% bio adhesive chlorhexidine gel reduces incidence of alveolar osteitis [12]. 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 [11]. Systemic antibiotics like penicillin, clindamycin, erythromycin and metronidazole are effective in preventing alveolar osteitis [12]. Local application of tetracycline in the form of powder or aqueous suspension, gauze drain and gel foam sponges, clindamycin impregnated gelfoam, lincomycin in gelfoam also reduces incidence of dry socket [12]. Other methods include use of platelet rich plasma (PRP) and platelet rich fibrin (PRF), vitamin C along with curettage and irrigation, topical application of hydrocortisone, antifibrinolytics like tranexamic acids, low level laser therapy (LLLT), biodegradable polymers, topical haemostatics, oxidised cellulose foam, dextranomer granule, some topical antiseptic combinations capable of releasing great amount of oxygen like combinations of sodium iodide and hydrogen peroxide, polylactic acid, and topical application of an emulsion of hydrocortisone and oxytetracycline [12,18-20]. If a dry socket appears, then the socket should be irrigated with warm normal saline and all degenerating blood clot is removed [6]. Sharp bony spurs should be either excised with rongeur forceps or smoothened with wheel stone [6]. A loose dressing, composed of zinc oxide and oil of cloves on cotton wool, is stuffed into the socket [6]. It must not be packed tightly or it may set hard and be very difficult to remove [6]. A pack, composed of Whitehead's varnish on ribbon gauze can also be used [6]. Analgesics like NSAIDS or narcotic based preparations such as acetaminophen with codeine, hydroxycodone or oxycodone and hot saline mouth baths are prescribed and arrangements are made to see the patient again in 3 days [6,12].

Delayed Healing of Wound

Systemic disease like anaemia, diabetes and long standing debilitating disease, wound infection, hypoxia, advanced age, drugs like antineoplastic drugs, chemotherapeutic drugs, anticoagulant, and glucocorticosteroid agents, malnutrition, foreign bodies like enamel, calculus, amalgam and bone fragments in the socket can cause a delay in tissue repair [1,21]. Suturing can reduce the healing time of extraction wounds [1]. Proper nutrition, fluid and

electrolyte balance, minimising excessive trauma, removal of foreign bodies like loose bone fragments, proper oral hygiene and protection of wound from mechanical and chemical irritants facilitates uncomplicated healing [1].

Sharp Bony Irregularities [22]

It is a less common post operative complication after extraction of lower third molar. It occurs mainly on the lingual aspect of the socket that can cause discomfort to the patient. Such an area is usually painful on palpation and may perforate the overlying mucosa. The bucco-lingual movement used to expand the tooth socket could cause the thin plate to fracture. The reduced bone elasticity in older patients, could lead to a greater incidence of bone plate fractures. This complication is treated by conservative approach. If the cortical plate is not loose, but causes pain, its removal is advised. The fragment may be trimmed using the existing perforation of the mucosa, or the mucoperiosteal flap is raised and the bony irregularity is removed using a surgical bur or a bone file. Asymptomatic bony irregularities should be left alone until spontaneous resolution occurs.

Acute Osteomyelitis of the Mandible

Osteomyelitis is an inflammation of the bone cortex and marrow that develops in the jaw usually after a chronic infection [23]. Extractions done in presence of acute infection (eg. Pericoronitis or acute ulcerative gingivitis) predisposes to acute osteomyelitis of mandible [6]. Most cases are seen in alcoholics, drug addicts, diabetes, in immunosuppresion due to steroids or cytotoxic drug intake, malignancies, malnutrition and AIDS [4]. In order to treat this complication, the cause is to be eliminated [23]. Treatment methods can be incision and drainage, sequestrectomy, saucerisation, decortication, resection of the jaw, hyperbaric oxygen therapy and broad spectrum bactericidal antibiotic like amoxicillin (500 mg, 8 hourly) and flucloxacillin (250 mg, 6 hourly) may be preferred [4,23]. Some clinicians advocate the use of clindamycin (300 mg, 6 hourly) because of its ability to diffuse widely in bone [4].

Dislocation of the Temporomandibular Joint

This complication occurs as a result of failure to support the mandible during forceps extraction [2]. To avoid this complication, the operator's left hand should ideally stabilize the jaw during this manoeuvre or a rubber bite block is used, which enables the patient in mandibular stabilization during tooth extraction [1,2]. 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]. Downward pressure with the thumbs and upward pressure with the fingers reduce the dislocation [6]. If treatment is delayed, muscle spasm may render reduction impossible except under general anaesthesia [6]. The patient should be warned not to open his mouth too widely or to yawn for a few days postoperatively, and an extra support for the joint should be applied until tenderness in the affected joint subsides [6].

Paraesthesia

Mental nerve is damaged by overextension of relieving incisions in the depth of the buccal sulcus in the lower premolar region [2]. Inferior Alveolar nerve injury is an uncommon occurrence in the extraction

of erupted mandibular teeth [1]. The roots of the third molars are in close proximity of the inferior alveolar nerve [2]. Thus there are chances of damage to the nerve during extraction [2]. Instrumentation like injudicious curettage or improper use of elevators to remove root apices, can also lead to damage to the nerve [1,2]. Such injuries result in paraesthesia and sometimes anaesthesia of half of the lower lip and chin [1]. In some cases, lip sensation is normal immediately after recovery from the anaesthesia, but sensory impairment develops over the next 24 hours due to a rise in pressure within the inferior dental canal as a result of postoperative oedema [4]. Lingual nerve is at risk of crush injury during periosteal elevation lingual to the lower third molar for the nerve runs very superficially on the lingual aspect of the mandible in this area [2,4]. It may also be damaged either during a traumatic extraction of a lower molar in which the lingual soft tissues are trapped in the forceps, or by being caught up with the bur during the removal of bone [6]. If the lingual nerve is severed there is loss of sensation in the anterior two- thirds of the tongue [4]. In most cases the nerve regenerates in 6 weeks to 6 months [1]. Vitamins (vitamin B_1, B_6, B_{12}) are to be given [2]. If dental treatment is to be continued, avoid re-administration of the local anaesthetic agent into the same region of the traumatized nerve [2]. If the nerve does not regenerate, the bony walls of the mandibular canal may have been displaced, impinging on it which is prevented by a decompression operation [1].

Oro-antral Fistula [24]

Oro-antral fistula (OAF) is an epithelialized pathological communication between oral cavity and maxillary sinus. It develops when the oro-antral communication fails to close spontaneously, remains patent and gets epithelialized. There is migration of oral epithelium into the defect. This epithelialisation usually occurs when the perforation persists for at least 48-72 hrs. This complication occurs most commonly during extraction of upper molar and premolar teeth (48%). The major reason is the anatomic proximity or projection of the roots within the maxillary sinus. The most common methods used for closure of OAF are the buccal flap and the palatal pedicled flap techniques. Successful closure of the oro-antral fistula should be preceded by the complete elimination of any sinus pathology, the fistulous tract, sinus infection, degenerated mucosa and diseased bone. The success rate of immediate closure of acute oro-antral defects has been reported to be as high as 95% but secondary closure of OAF has low success rate of 67%. Other methods that can be used to treat OAF are bone autografts, auricular cartilage, maxillary sinus lift surgery, 3rd molar transplantation technique, sandwich technique for the closure of oro-antral defects, guided tissue regeneration (GTR) technique, nonporous hydroxylapatite blocks, gold foil or gold plate or aluminium foil and laser light in low doses. The patient should be instructed to eat soft food by the opposite side to avoid trauma to the operation site. Strenuous physical activity which can increase the intra-sinusoidal pressure should be avoided. Nose blowing, sneezing or coughing with a closed mouth is prohibited for 2 weeks. Patient should not roll tongue over suture line or the flap for 7 days after surgery. The wound should be kept clean with warm saline mouth rinses and steam inhalation should be done. Use of straw or smoking is prohibited. Antibiotics like amoxycillin and clavulinic acid or clindamycin for at least 5 days, decongestant nasal drops and NSAIDS for pain control should be prescribed.

Apthous Ulcer [25]

Iatrogenic trauma has been implicated as a predisposing factor for minor Apthous ulcer. Apthous ulcer presents as painful lesions, lasts for several days or weeks, heal, and then after a variable interval recur. The cause of apthous ulcer is unknown but, it is thought to be due to manifestation of auto immunity, local trauma, hormonal changes, stress, iron deficiency anaemia, or nutritional deficiency such as folic acid and vitamin B_{12}. Painful cases are treated by topical anaesthetics, antimicrobials, or corticosteroid preparation.

Surgical Emphysema [5]

It is a collection of air which has been forced into the tissue spaces through the extraction wound and forms a swelling which characteristically crackles on palpation, which gives rise to discomfort. It results from increased air pressure in the mouth from using an air spray, or blowing a trumpet or a balloon. The condition settles without treatment as the air is slowly absorbed.

Osteoradionecrosis

Osteoradionecrosis (ORN) was first described by Marx in 1983 as hypovascularity, hypocellularity and local tissue hypoxia [2]. Post radiation tooth extraction plays a crucial role in the pathogenesis of ORN [26]. All teeth in the anticipated radiation field that may require extraction should ideally be removed before the patient undergoes radiotherapy treatment [2]. Thorough aseptic care during extraction prevents ORN [2]. The condition is treated by conservative treatment methods like improvement of oral hygiene, antibiotics, analgesics, use of hyperbaric oxygen therapy or by surgical treatment like segmental resection of the bone [2,26].

Post Extracion Advices

Along with post operative medications proper post operative instructions play important role to prevent post surgical complications.

Significance of Post Extraction Advices

1) Application of Moist Gauze

After extracting teeth, haemorrhage is arrested by asking the patient to bite gently, but, firmly on the rolled up moist gauze swab placed over the socket [5]. The pressure pack is given post operatively, which should be maintained for about an hour to achieve adequate hemostasis [2]. Talking should be minimum for 3-4 hours [3]. The gauze should be moistened so that the oozing blood does not coagulate in the gauze and then dislodge the clot when the gauze is removed [3].

2) Avoidance of Spitting [3]

The patient should be advised not to spit during the first 12 hours after surgery. The process of spitting involves negative pressure, which may prolong bleeding.

3) Avoidance of Use of Straw [12]

Physical dislodgement of blood clot can be caused by manipulation or negative pressure created via sucking on a straw which could be major contributor of alveolar osteitis.

4) Rest [3]

No strenuous exercise should be performed for the first 12-24 hours after extraction. The increased circulation may result in bleeding.

5) Soft Diet

Only liquids and soft solids, warm or cold food should be eaten on the first day [1]. If the extraction is limited to one side, chewing can be done on the un-operated side, but when local anaesthesia has been used, chewing should be avoided until sensation has returned [1]. Cool and cold food help keep the local area comfortable [3].

6) Oral Hygiene

No cleansing of the mouth is advised for the first 24 hours after operation which causes harm by starting haemorrhage [5]. Thereafter, mucous membrane and teeth may be cleaned with a soft tooth brush or foam pads attached to orange sticks, and mouth irrigated with 0.2% aqueous chlorhexidine after every meal [5]. Patient should be advised that keeping the teeth and mouth reasonably clean results in a more rapid healing of their surgical wounds [3].

7) Cold Application

To prevent excessive oedema formation, cold compressions are advisable, intermittently for first 24 hours [2]. The application of cold induces vasoconstriction which reduces exudation of fluid and blood into the tissue spaces and prevents excessive oedema [2]. This agent should be used intermittently, because prolonged use of cold leads to compensatory vasodilatation [1]. Cold is applied for 30 minutes each hour [1]. Once swelling has reached its maximum (usually after 24 to 48 hours), cold is no longer effective, and heat, in the form of moist compresses, should be applied [1].

8) Warm Saline Mouth Rinse

Use of a warm saline mouthwash at least twice daily significantly reduces the incidence of alveolar osteitis and reduces postoperative facial oedema [27,28]. No cleansing of the mouth is advised for the first 24 hours after operation as it may start hemorrhage [5]. This should be done after 24 hours as it causes vasodilatation which may aggravate oedema [1]. Warm saline gargle should be done after 48 hours, as by this time the vascular stage of inflammation settles and cellular stage starts which is important to prevent infection and promote healing [1]. Warm saline gargle improves the circulation by inducing vasodilatation and facilitate the re-absorption of the interstitial fluid, thus reducing interstitial fluid pressure, enhances migration of phagocytes to the extraction site, reduces stasis, mucosal congestion, improves drug delivery and ensures that humoral factor, necessary to promote healing, reach the site [1,2,29]. The hypertonic nature of the solution is believed to inhibit bacterial activity [29].

9) Smoking

Heat released from cigarette smoke and toxic by-products of tobacco such as nicotine, hydrogen cyanide and carbon monoxide could be risk factors affecting success of dental procedures [30]. Smoking affects the pharmacokinetics of numerous drugs, for example, local anaesthetics (LA) [31]. In a study it is found that more anaesthetic solution is needed to achieve anaesthesia in smokers than in non-smokers [31]. This constitutes the peri-operative complication of smoking. LA binds to the sodium channel, thus making it impermeable to sodium [31]. LA stop creation and transmission of electrical impulses in neurons by interfering the sodium ion channel within the neural cell membrane [31]. Nicotine in tobacco selectively attaches to “nicotinic cholinergic

receptor" [31]. After binding to the channel, it is opened allowing the entrance of cations, sodium and calcium [31]. Thus, the mechanism of action of LA and nicotine is paradoxical, while lidocaine closes the channel and prevents entry of sodium, nicotine makes the channel open to entry of sodium [31]. Results from studies indicate post operative incidence of pain, reduced bleeding, increased risk of trismus and increased postoperative infection in smokers [14,32,33]. The suction associated with cigarette smoking might dislodge the clot from alveolus and interrupt healing [14]. Heat released from burning tobacco may act as contaminant in the surgical site [30]. Smoking impairs gingival fibroblast's ability to adhere, inhibits fibroblast proliferation and collagen and fibronectin synthesis, and promotes collagen breakdown, thus, interfering with wound healing [30,34,35]. Release of catecholamines inhibits epithelialization [30]. Nicotine, carbon monoxide and hydrogen cyanide are cytotoxic to cells [15,30,35]. Fibrinolytic activity reduces alveolar blood supply and reduces post operative socket filling after dental extraction, leading to dry socket [14,34]. Nicotine has a negative effect on bone healing by diminishing osteoblast function and stimulates osteoclast activity [14,35]. Smoking leads to compromised polymorphonuclear leukocyte function, impaired humoral and cell mediated immunity and decreased immunoglobin activity [34,36]. Stopping smoking, 2 months before surgery provides maximum benefit [36]. Abstinence of at least 3-4 weeks is needed to reduce complications related to effective wound healing [36]. However, to reduce the volume of sputum production, one needs to quit smoking for at least 1-2 weeks [36]. Stopping smoking even 1 day before surgery help in improving tissue oxygen delivery by reducing the carboxyhemoglobin levels [36]. The half life of nicotine and carboxyhemoglobin are 30-60 minutes and 4-6 hours respectively [36]. Therefore abstinence for 12-14 hrs brings down the nicotine level to normal [36].

10) Alcohol Consumption

Patient is to be advised to avoid drinking alcohol as it dilates blood vessels and may cause post extraction bleeding [1]. Alcohol impairs wound healing by interfering with protein metabolism and increases the incidence of infection [26]. Chronic alcoholism can cause thrombocytopenia (low platelet numbers) and thrombocytopathy (impaired platelet function) [37]. MCV (Mean corpuscular volume) in a full blood count increases (macrocytosis) within 4-8 weeks on the onset of heavy drinking [37]. In alcoholic liver disease, the coagulation profile [PT (Prothrombin time), APTT (Activated Partial Thromboplastin Time)] is altered [37]. Other complications due to alcoholism includes poor oral hygiene and malnutrition [38]. NSAIDS should be avoided or used with extreme caution in the cirrhotic patient, as it increases the risk of gastrointestinal bleeding [39]. Patient should be warned to avoid drinking alcohol whilst metronidazole is being taken and for 3 days after completing the course of treatment [6]. Disulfiram like reactions (i.e. flushing, nausea, sweating) occurs after alcohol consumption [40].

Conclusion

Complications are common following any tooth extraction. The dental surgeon should always aim to prevent their insurgence. If complications arise then the surgeon should be aware of how to manage these post extraction complications. As per the significance of the post extraction advices, patients should also

thoroughly follow these to prevent emergence of complications.

References

1. Laskin DM. Oral and maxillofacial surgery. Mosby (1980).
2. Borle RM. Textbook of oral and maxillofacial surgery. JP Medical Ltd (2014).
3. Peterson LJ, Ellis E, Hupp JR, et al. Contemporary Oral and Maxillofacial Surgery. 4th Edition (2003).
4. Killey and Kay's Outline of Oral Surgery, Part I and Part II.
5. Moore UJ. Principles of Oral and Maxillofacial Surgery. 5th Edition (2001).
6. Howe GL. Minor Oral Surgery. 3rd Edition.
7. Mitchell D. An introduction to oral and maxillofacial surgery. CRC Press (2014).
8. Cho H, Lynham AJ, Hsu E. Postoperative interventions to reduce inflammatory complications after third molar surgery: review of the current evidence. Australian Dental Journal 62 (2017): 412-419.
9. Alkhabuli J, Kokovic V, Emad A. Post extraction lingual mucosal ulceration with bone necrosis. The Saudi Journal for Dental Research 7 (2016): 34-37.
10. Purohit JN. Incidence of dry socket after surgical removal of the third molar: a retrospective study. Sch J Dent Sci 3 (2016): 287-289.
11. Jesudasan JS, Wahab PA, Sekhar MM. Effectiveness of 0.2% chlorhexidine gel and a eugenol-based paste on postoperative alveolar osteitis in patients having third molars extracted: a randomised controlled clinical trial. British Journal of Oral and Maxillofacial Surgery 53 (2015): 826-830.
12. Gowda GG, Viswanath D, Kumar M, et al. Dry socket (alveolar osteitis): Incidence, pathogenesis, prevention and management. J Indian Acad Oral Med Radiol 25 (2013): 196-199.
13. Mamoun J. Dry socket etiology, diagnosis, and clinical treatment techniques. Journal of the Korean Association of Oral and Maxillofacial Surgeons 44 (2018): 52-58.
14. Balaji SM. Tobacco smoking and surgical healing of oral tissues: a review. Indian Journal of Dental Research 19 (2008): 344.
15. Vettori E, Costantinides F, Nicolin V, et al. Factors Influencing the Onset of Intra-and Post-Operative Complications Following Tooth Exodontia: Retrospective Survey on 1701 Patients. Antibiotics 8 (2019): 264.
16. Khan AH. Prevalence and association of dry socket in oral health and dental management. Oral Health Dent Manag 16 (2017): 1-6.
17. Noroozi AR, Philbert RF. Modern concepts in understanding and management of the "dry socket" syndrome: comprehensive review of the literature. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology 107 (2009): 30-35.
18. Taberner-Vallverdú M, Sánchez-Garcés MÁ, Gay-Escoda C. Efficacy of different methods used for dry socket prevention and risk factor analysis: A systematic review. Medicina Oral, Patologia Oral y Cirugia Bucal 22 (2017): e750.
19. Kolokythas A, Olech E, Miloro M. Alveolar osteitis: a comprehensive review of concepts

and controversies. International Journal of Dentistry (2010).

20. Cardoso CL, Ferreira Júnior O, Carvalho PS, et al. Experimental dry socket: microscopic and molecular evaluation of two treatment modalities. Acta Cirurgica Brasileira 26 (2011): 365-372.
21. Kaban LB, Pogrel MA, Perrott DH. Complications in oral and maxillofacial surgery. WB Saunders Co (1997).
22. Alves-Pereira D, Figueiredo R, Valmaseda-Castellón E, et al. Sharp mandibular bone irregularities after lower third molar extraction: Incidence, clinical features and risk factors. Medicina Oral, Patologia Oral y Cirugia Bucal 18 (2013): e455.
23. Nezafati S, Ghavimi MA, Yavari AS. Localized osteomyelitis of the mandible secondary to dental treatment: report of a case. Journal of Dental Research, Dental Clinics, Dental Prospects 3 (2009): 67.
24. Khandelwal P, Hajira N. Management of oro-antral communication and fistula: various surgical options. World Journal of Plastic Surgery 6 (2017): 3.
25. Azodo CC, Erhabor P. Aphthous ulcer following forceps extraction: A complication or coincidental event. Indian Journal of Multidisciplinary Dentistry 8 (2018): 52.
26. Chronopoulos A, Zarra T, Tröltzsch M, et al. Osteoradionecrosis of the mandible: a ten year single-center retrospective study. Journal of Cranio-Maxillofacial Surgery 43 (2015): 837-846.
27. Osunde OD, Adebola RA, Adeoye JB, et al. Comparative study of the effect of warm saline mouth rinse on complications after dental extractions. International Journal of Oral and Maxillofacial Surgery 43 (2014): 649-653.
28. Naik C. Efficacy of Warm Saline and Chlorhexidine Mouth Rinses in the Prevention of Alveolar Osteitis after Third Molar Surgery: A Comparative Study. International Journal of Oral Care and Research 5 (2017): 270-273.
29. Osunde OD, Anyanechi CE, Bassey GO. Prevention of alveolar osteitis after third molar surgery: Comparative study of the effect of warm saline and chlorhexidine mouth rinses. Nigerian Journal of Clinical Practice 20 (2017): 470-473.
30. Soodan KS, Priyadarshni P, KAur K. An effect of smoking on wound healing following extraction: A critical study. IOSR Journal of Dental and Medical Sciences 14 (2015): 66-70.
31. Al-Noori NM, Ibraheem NS, Abdulmunem MM. The impact of cigarette smoking on the efficiency of local anesthesia during simple tooth extraction. The Saudi Dental Journal (2020).
32. Sanari AA, Alsolami BA, Abdel-Alim HM, et al. Effect of smoking on patient-reported postoperative complications following minor oral surgical procedures. The Saudi Dental Journal. (2019).
33. Ra'ed M. The effect of cigarette smoking on the severity of pain, swelling and trismus after the surgical extraction of impacted mandibular third molar. Journal of Clinical and Experimental Dentistry 5 (2013): e117.

34. Kasat V, Ladda R. Smoking and dental implants. Journal of International Society of Preventive & Community Dentistry 2 (2012): 38.
35. Giorgetti AP, César Neto JB, Casati MZ, et al. Cigarette smoke inhalation influences bone healing of post-extraction tooth socket: a histometric study in rats. Brazilian Dental Journal 23 (2012): 228-234.
36. Samantaray A. Smoking and Anaesthesia: Implications during perioperative period. Journal of Clinical and Scientific Research 7 (2018): 75.
37. Quach S, Brooke AE, Clark A, et al. Blood investigations prior to oral surgery for suspected alcohol-induced coagulopathy. Are they necessary?. British Dental Journal 219 (2015): 121-123.
38. Khairnar MR, Wadgave U, Khairnar SM. Effect of alcoholism on Oral health: a review. J Alcohol Drug Depend 5 (2017): 1-4.
39. Martínez SR, Serna JT, Silvestre FJ. Dental management in patients with cirrhosis. Gastroenterología y Hepatología (English Edition) 39 (2016): 224-232.
40. Weathermon R, Crabb DW. Alcohol and medication interactions. Alcohol Research & Health 23 (1999): 40.