International Journal of General Medicine and Pharmacy (IJGMP)
ISSN (P): 2319–3999; ISSN (E): 2319–4006
Vol. 10, Issue 2, Jul–Dec 2021; 109–122
© IASET

International Academy of Science, Engineering and Technology
Connecting Researchers; Nurturing Innovations

CAUSATIVE FACTORS TO POST-OPERATIVE COMPLICATIONS FOLLOWING TOOTH EXTRACTION: RETROSPECTIVE SURVEY AT SPECIALIZED DENTAL CENTRE, KFH, MADINAH, KSA

Ahmad Zakour, Ahmad Al Shehri, Mohammed Alkhathaami, Mohammad Al Rowias, Taha Shaqrun & Abrar Nahhas

Research Scholar, Specialized Dental Centre, KFH, Medina, KSA

ABSTRACT

Tooth extraction is one of the most common and oldest oral surgical procedures performed by dentists and oral surgeons. Extraction of teeth often leads to complications. A complication is possible in more than half of all tooth extraction instances. Complications can affect the surrounding bone, sinus, soft tissue (periodontium, vascular, nerves, and so on) as well as the tooth. An extraction, on the other hand, should include the following steps: pre surgical/extraction evaluation, treatment planning, contingency treatment planning, extraction, and (5) postsurgical/extraction evaluation.

Methods

The study was conducted at the specialized Dental Centre, KFH, Medina, KSA between January 1, 2019 and May 31, 2021. The study was conducted in accordance with the Declaration of Helsinki, and ethical approval was obtained. We reviewed patient records and analyzed the data of 1500 patients between January 1, 2019 and May 31. From a pooled sample size of 350 extractions done during this period, data of patients reporting for post-extraction complications were segregated and analyzed.

Results

A total of 1500 patients who had exodontia procedures. There were 870 males and 630 females among the patients, with an average age of 55.3± 19.9 years. In terms of medical history, more than a third of patients affected with hypertension, while diabetes afflicted more than 10%. Psoriasis, rheumatoid arthritis, pemphigus, pemphigoid, Stogner's syndrome, and erythematous systemic lupus were the most commonly reported autoimmune illnesses. In terms of infectious diseases, the most common was HCV (5 %).

Conclusion

Periodontal disease and caries were the most common causes of tooth extraction. dry socket was the most common post-operative complication. Surgical trauma should be minimized with an appropriate surgical technique

KEYWORDS: *Periodontal, Disease, Tooth, Extract, Surgery*

Article History

Received: *11 Dec 2021* | ***Revised:*** *24 Dec 2021* | ***Accepted:*** *24 Dec 2021*

INTRODUCTION

Tooth extraction is one of the most common and oldest oral surgical procedures performed by dentists and oral surgeons. Extraction of teeth often leads to complications. A complication is possible in more than half of all tooth extraction instances. [1,2] Complications can affect the surrounding bone, sinus, soft tissue (periodontium, vascular, nerves, and so on) as well as the tooth. An extraction, on the other hand, should include the following steps: (1) presurgical/extraction evaluation, (2) treatment planning, (3) contingency treatment planning, (4) extraction, and (5) postsurgical/extraction evaluation.

Advanced periodontal disease, abscess or phlegmon, non-restorable caries, residual roots, tooth fracture, unsuccessful endodontic treatments with the persistence of periapical granulomas or cysts, and third-molar impaction are all reasons for tooth extraction [1]. An orthodontic or prosthodontic treatment plan may include extraction. Alveolitis, swelling, pain, abscess, fever, a dry socket, oedema, and lockjaw are some of the consequences that might occur after surgery [2,3]. Other complications include bone spicules, post-operative hemorrhage, and paresthesia.

According to a Cochrane review of randomized controlled trials, the risk of postoperative infection after a third molar extraction is roughly 10% in young patients who are physically fit. Prior to the extraction, however, the risk is raised by up to 25% in individuals with a weakened immune system [4].

Complications are multifaceted, with links to the patient's health and lifestyle, as well as systemic and local variables. First, patients' lifespans are rising, and dentists are seeing an increasing number of medically impaired patients; second, patients' medical histories may impact some of the most prevalent surgical issues [4,5].

Many clinical conditions can affect wound healing, including diabetes mellitus (DM), which is characterized by a number of local cytokine and cellular abnormalities such as reduced angiogenesis and decreased collagen synthesis [6], HIV infection (HIV) because of the progressive destruction of the immune system [7], chronic obstructive pulmonary disease (COPD) because of reduced oxygen supply, Cushing's Syndrome, anemia, and malnutrition [8].Concurrent oncologic treatment (radiotherapy or chemotherapy), hepatic disease, renal failure, thyroid disease, immunosuppression, and extended corticosteroid therapy, as well as immunosuppression and prolonged corticosteroid medication, all have a deleterious impact on wound healing [9,10].The deposition and remodeling of the woven bone, which is aided by the blood filling of post-extraction sockets, is the final step in the healing process. Smoking is one factor that affects clot formation and, in general, has a negative impact on extraction wound healing. Nicotine has been shown in vitro to have a detrimental impact on osteoblasts, decrease fibroblast development, collagen and fibronectin formation, and promote collagen breakdown [11].

Drug use may potentially impact the beginning of intra- and/or postoperative problems, such as bleeding induced by anticoagulant or antiplatelet therapy, platelet abnormalities associated with liver illness, or hypertension-related bleeding [12,13].

Complications are also more likely to develop in the case of complicated/multiple extractions or unusual anatomic problems, which may or may not be related to the surgical site. For example, when the root apices of maxillary teeth are attached to the maxillary sinus, maxillary tuberosity fracture or oro-antral fistulae might occur. [14] or, in the mandible, the closeness of the inferior alveolar nerve. Because impacted/decayed/fractured teeth often necessitate a more thorough

operation, post-operative problems such as swelling, infection of the surgical site, and post-operative bleeding may be linked to surgical intervention [15].

The use of antibiotics before or after tooth extractions to avoid problems after tooth extraction is still debatable. In the literature, there is no consensus on the effectiveness and appropriateness of antibiotic prescription in preventing surgical site infections like alveolitis [16,17,18].

Even while some dentists prescribe antibiotics to prevent postoperative infections after tooth extractions, the problem continues to be a source of debate in clinical practice because the risk of patients contracting an infection after extraction can be caused by a variety of circumstances. Antibiotic use, patient gender, age, presence of systemic disease, smoking, extraction complexity, length of operation, surgical technique, and surgical expertise are all factors that influence the occurrence of infection after extraction [5–8]. Studies on the effects of antibiotic use following extractions have yielded inconsistent results, leaving the question of whether antibiotics are necessary post-extraction unanswered. While some researchers have found antibiotics to be effective in preventing infections after third molar extractions [9–11], other studies have found antibiotics to be ineffective in preventing post extraction infections [4, 12–18].

Although different antibiotics have been shown to reduce the risk of postoperative infections after third molar extractions, there is no consensus on the type of antibiotic to use or the appropriateness of antibiotic prescription [19]. Furthermore, a low infection rate (5%) following third molar surgeries, as well as the global issue of antibiotic resistance, discourage the routine use of antibiotics when they are not required [11]. Dental practitioners can use a more evidence-based approach in their practice if they have a good awareness of the effectiveness of antibiotics in the prevention of postoperative infection and the factors that contribute to infection.

Retrospective studies of adequately documented health data have been demonstrated to have particular advantages in assessing low-incidence outcomes, discovering multiple outcomes, and lowering study cost and time [20]. The goal of this study was to determine the frequency of postoperative complication following tooth extractions performed at specialized dental center at king Fahad hospital, Madinah, Saudi Arabia between January 1, 2019 and May 31, 2021, to estimate the prevalence of postoperative complication, and to identify factors linked to postoperative complication.

METHODS

The study was conducted at the specialized Dental Centre, KFH, Medina, KSA between January 1, 2019 and May 31, 2021. The study was conducted in accordance with the Declaration of Helsinki, and ethical approval was obtained. We reviewed patient records and analyzed the data of 1500 patients between January 1, 2019 and May 31. From a pooled sample size of 350 extractions done during this period, data of patients reporting for post-extraction complications were segregated and analyzed. The study included all patients who had a single or multiple teeth extracted within the specified time period between January 1, 2019 and May 31, 2021. Individuals who had periodontal surgery or extensive oral surgery were excluded, as well as patients who did not specify which antibiotic was prescribed following extraction.

Patient demographic data, medical history, onset of intra-operative complications and the onset of post-operative complications were collected from the patient's files. The statistical analysis was done using SPSS Version 20 by IBM.

RESULTS

A total of 1500 patients who had exodontia procedures. There were 870 males and 630 females among the patients, with an average age of 55.3± 19.9years.In terms of medical history, more than a third of patients affected with hypertension, while diabetes afflicted more than 10%. Psoriasis, rheumatoid arthritis, pemphigus, pemphigoid, Sjogren's syndrome, and erythematous systemic lupus were the most commonly reported autoimmune illnesses. In terms of infectious diseases, the most common was HCV (5 %), however HIV and HBV were also discovered. Only 661 individuals (38.86%) were found to be taking no drugs, whereas more than 60% were being treated with one or more chronic therapies. Nearly a third of the patients were smokers. Periodontitis, caries, dysodontiasis, fracture, and abscess or phlegmon were the most common reasons for extraction, with periodontitis, caries, dysodontiasis, fracture, and abscess or phlegmon being virtually evenly distributed between the maxillary and mandibular regions. Exodontic surgery in both jaws was performed on a small number of patients. A permanent tooth was extracted in 57% of instances, a remnant root in 33.45% of cases, and a totally or partially impacted tooth in nearly 10% of cases. In 15.70 % of extractions, a flap was used to facilitate extraction procedures and main intention healing, however in 15.64 % of instances, osteoplasty was required during intervention.

DISCUSSION

When the patient's age is taken into account for each reason for tooth extraction, interesting findings are achieved. Periodontal disease causes tooth loss in the elderly, who have an average age of 67.6± 11.5 years. Caries is more common in a little younger population, with a mean age of 63.0± 14.9 for patients requiring tooth extraction, whereas endodontic difficulties leading to extraction are more common in a population even younger, with a mean age of 61.8 ± 12.2.

Many articles show a similar correlation with overlapping results: periodontal disease is most common in elderly populations in Italy, Norway, Greece, England and Wales, Kuwait, and Japan, while caries is the leading cause of extraction and affects many people, and is related to not only age but also education and socioeconomic status [4,5,7,26,27,28,29,30].

During extraction treatments, an average of 4.6 - 4.7 teeth per patient were lost. This number is much higher than the mean number of extracted teeth in Italy recorded by Angelillo et al. [5] (1.77 for patients >65 years old) [5,7,9,28,30]. It is also much higher than the mean number of extracted teeth in other studies in Japan (1.53 teeth per patient), Canada (2.3 teeth per patient), Kuwait (1.73 teeth per patient), and Norway (1.3 teeth per patient). The results could be explained by the fact that many of the patients treated at the hospital are from low-income families

Periodontal difficulties were the most common reason for extraction (48 % of all extracted incisors), likely because they are less prone to cavities and are most commonly lost by elderly patients with periodontal disease [6].

Caries was the most common reason for molar extraction (54.6 % of all molar extractions), with periodontal disease accounting for only one-third of all molar extractions. Because of its architecture, which includes pits and grooves, molars are more likely to develop cavities. The early loss of first and second molars is caused by poor dental hygiene.

Males were more prone to repeated extractions than females, with (55.8%) of the reviewed data being male. (71.1%) of teeth extraction were extracted from male patients, indicating that males were more prone to multiple extractions than females. Males are less interested in reconstructive therapy than females, according to some authors [6].

Dry socket is the most common complication following tooth extraction; the exact cause of this issue is unknown, however an increase in fibrinolytic activity is commonly thought to be the main etiologic component that causes the blood clot to dissolve. Dry socket was minimized when anti-fibrinolytic drugs were administered at the site of tooth extraction, according to Momeni H. et al. [20].

Furthermore, some studies have shown a link between dry socket and smoking [21,22]; cigarette smoking lowers post-operative socket filling with blood, which slows wound healing [23]. Furthermore, nicotine, which is a cytotoxic agent [24], interferes with the expression of a number of genes that are important for the development of new capillaries and bone healing, resulting in an enhanced catabolic response that may be detrimental to new bone production and wound healing [25].Nonetheless, some writers claim that dry socket is more common following traumatic tooth extractions (e.g., surgical extractions), but not in smokers [26].

Almost all surgical sites were sutured in this study, and the number of post-operative problems was relatively low. According to the literature, after a tooth extraction, the socket heals with the creation of a stable clot, migration of epithelium onto the clot, and remodeling of the alveolar bone; as a result, sutures placed over the site may help to maintain the clot and aid socket recovery [27].

According to the literature, the rate of post-surgical complications after oral surgery in patients with head and neck cancer ranged from 10% to 45 % [28]; however, the %age of all post-surgical difficulties in our group was only 3.17 %. The coat's stability is assured by stitches, which could explain this finding. The use of local hemostatic agents, sutures, and tranexamic acid reduced the incidence of postoperative bleeding after tooth removal in patients receiving anticoagulant therapy, according to Svensson R et al. [29,30].

The efficacy of tranexamic acid application after tooth extraction to promote wound healing and prevent post-surgical complications such as alveolitis was reported by Anaand KP et al. [31], which is consistent with the correlation between the presence of coagulopathy and the development of alveolitis found in this study. Coagulation disorders prevent the creation of a stable blood clot, and because the initial blood clot formed inside the alveolar socket disintegrates, the socket fails to repair, dry socket develops.

The multiple backward logistic regression model 2 shows a link between polypharmacological treatment, concurrent chemotherapy, and osteoplasty execution and the occurrence of post-operative problems (including alveolitis).Pharmacologic therapies such as antiplatelet/anticoagulant/antihypertensive drugs can affect bleeding after dental extractions; literature reports show that dental extractions can be performed safely in patients on antiplatelet therapy [32] without withdrawal therapy because stopping antiplatelet therapy puts the patient at a higher risk of cardiovascular events [33,34] than the intervention itself. Patients taking antiplatelet or anticoagulant medicines or suffering from hypertension made up 18.1 %, 7.9 %, and 33.8 % of the study participants, respectively, with a reported bleeding rate of 0.4 %.

Before conducting the extraction, the International Normalized Ratio (INR) was assessed for each patient who was starting anticoagulant treatment, and if it was higher than 3.5, the procedure was postponed. The results show that dental extractions can be performed safely in these individuals [35], as none of the patients had ceased antiplatelet or anticoagulant therapy before the procedure.

In their systematic review, Tarakji B et al. [30] identified a number of risk factors associated with the development of alveolitis after exodontia alone, including surgical trauma, anaesthesia dose, extraction site and number, age, sex, medical history and systemic disorders, operator experience and difficulty of the surgery, antibiotics use prior to surgery, previous infection of the surgical site in addition to oral contraceptives, menstrual cycle, and the immediate post-extodontia period."Presence of coagulopathy," "smoking habit," "surgical trauma" (where the reason for extraction was tooth fracture), and "prior odontogenic abscess" were the only factors linked to the development of alveolitis in this study [36].

Chemotherapy-induced adverse effects are not rare [37], thus it is easy to deduce that patients who have teeth extracted during chemotherapy are more likely to experience difficulties during socket repair.

We discovered that simultaneous chemotherapy is likely to have a huge impact on the occurrence of post-operative problems using backward multiple logistic regression (including alveolitis). This data is bolstered when we examine the large number of cases.

Diabetes is another illness that puts patients at a higher risk of delayed healing and wound infection after surgery [38]. However, it is uncertain if diabetes patients are more likely than non-diabetic patients to acquire surgical infection after tooth extractions [39,40]. Diabetes did not appear to affect the post-operative outcome in this investigation.

Difficulties following oral surgery can occur for a variety of reasons, including medical history and pharmacological therapies; however, there are also complications related to the surgical site, such as wisdom teeth extraction and its proximity to the inferior alveolar nerve.

An effective diagnostic tool is required to avoid iatrogenic consequences such as inferior alveolar nerve paresthesia, root fractures, or severe hemorrhage during invasive surgical operations.

For a more exact study of the link between the third molar and noble structures like the inferior alveolar nerve, Pathak S et al. [2] proposed either a computed tomography (CT) or a Cone Beam Computed Tomography (CBCT). Panoramic radiography, in fact, is not always accurate [41]. Although this could be of great interest for additional research, the number of post-operative paresthesia in this study was too high to assess the usefulness of prescribing second level imaging scans for pre-operative surgical site evaluation.

According to the findings of this study, antibiotic medication given before to tooth extraction had no effect on the recurrence of post-exodontic infections. Antibiotic therapy prior to oral surgery did not diminish the incidence of post-operative alveolitis (p-value > 0.05), according to the multivariate analysis.

Antibiotic therapy after exodontia for the prevention of post-operative infection is not well-defined in the literature, and many studies disagree about the usefulness of antibiotic treatment before and after dental procedures like tooth extraction.

In a double-blind placebo-controlled clinical trial, Arteagoitia I et al. [42] found no statistical significance in the insurgence of post-operative infections in patients treated with antibiotic therapy after surgical extraction of completely bone-impacted third molars versus patients who were not treated. In addition, Luaces-Rey R et al. [43] discovered that amoxicillin should not be used following exodontia. They discovered a non-statistically significant difference between individuals who were given antibiotics after surgery and those who were not.

However, it has been well established that bacteremia can arise during tooth extractions. In their systematic review and meta-analysis, Moreno-Drada JA et al. [44] discovered that bacteremia was reported in 100 % of patients who underwent dental extraction, although the %age was lower after other dental treatments such as endodontic treatment or implant implantation. Antibiotic prophylaxis reduced the prevalence of bacteremia, and it may also lower the occurrence of infections after surgery, according to this study.As the problem of drug-resistant bacteria has grown in recent years, the medical community has attempted to limit antibiotic use, including after dental treatments. Antibiotic medication in healthy patients does not lower the incidence of post-operative problems, according to numerous studies [45], hence prescriptions should be directed at reducing the likelihood of antibiotic resistance.

Some authors, however, disagree that antibiotic therapy after third molar surgery is beneficial to post-operative recovery; for example, López-Cedrn et al. [46] compared two antibiotic therapy regimens in patients undergoing third molar surgery before and after surgery in a double blind controlled study. Amoxicillin medication after surgery had a statistically significant positive influence on post-operative healing, according to the findings.

Antibiotic administration to prevent post-extraction complications is controversial at the moment; the decision on whether or not to prescribe antibiotics after dental extraction is based on a risk assessment, with experts approaching the factors involved in the risk-benefit analysis differently. As a result, doctors must carefully address the potential benefits and risks of prescribing antibiotics with their patients.

Only 1.4 % (25 patients) had a postoperative infection after tooth extraction, according to the records, while 31.8 % (579 patients) had no complications after extraction and 66.8% (1217 patients) had no records of a follow-up appointment for problems related to the tooth extraction and were thus coded as having no infections. Simple extractions accounted for 12 cases, while complex extractions accounted for 13. This is in line with prospective research that found that in regular extractions of erupted teeth, the rate of postoperative infection, such as infection in the alveolar bone, dry socket, and postoperative pain, is low [21].Furthermore, infection rates after third molar extractions were reported to be negligible in a recent 5-year retrospective research [11]. However, more than half of the extraction patient instances (up to 66.8% of the total extraction cases) had no records of a follow-up. As a result, it's probable that some of these patients had a postoperative infection but did not seek treatment at IMU-OHC. Nonetheless, the need for antibiotics prescription for the goal of preventing infection after tooth extractions is debatable, given the overall low rates of postoperative infection after tooth extractions in both our study and previous published studies.

Antibiotic prescription following a dental extraction was not found to be common practise in IMU-OHC, with just 12.4 % of patients receiving antibiotics. In addition, only 1% of patients who did not receive an antibiotic prescription developed a postoperative infection, but 3.6 % of patients who received an antibiotic prescription developed an infection after extraction. Antibiotics are not recommended in the prevention of postoperative infections following extractions, according to several research [4, 12–18], because their effects in reducing the risk of infection are not significant.However, antibiotics have been used successfully to prevent postoperative infections after third molar extractions [9, 10]. Nonetheless, given the low overall incidence of postoperative infection in our study (1.4%), the low incidence of postoperative infection without antibiotic prescription (1%), and the occurrence of infection after extraction despite antibiotic prescription (3.6%), antibiotic prescription after extractions remains debatable.

Antibiotic resistance is a global problem that has become a hazard in the prevention and treatment of numerous illnesses [11]. As a result, antibiotics should be provided with caution. In our study, amoxicillin was the most commonly

given antibiotic following extraction in 61.6 % of the patients who received antibiotics. All eight patients who developed a postoperative infection despite receiving antibiotics were given amoxicillin or one of its combinations; five were given amoxicillin, two were given amoxicillin plus metronidazole, and one was given prophylactic amoxicillin. The widespread use of amoxicillin reveals dentists' predilection for prescribing this antibiotic to prevent infections following extractions [11, 22–27]. However, a recent study found that common medicines like amoxicillin were ineffective in preventing postoperative infections after extractions, probably due to antibiotic resistance [11].

Patients less than 30 years old had the highest rate of postoperative infection (3.5%), while those between 30–60 years and above 60 years had rates of 1.2 % and 0.4 %, respectively. This contradicts earlier clinical study, which found that advanced age and comorbidity raise the likelihood of problems following extractions [28].According to certain research, the peak age range for a higher incidence of dry socket is around 20 to 40 years old [29]. This could be owing to the fact that third molar extraction operations are typically performed on young individuals.

Of the 25 instances with a postoperative infection, 22 (88%) were performed by dental students, while just 3 (12%) were performed by dentists and none were performed by oral surgeons. When compared to a dentist or an oral surgeon, the operation time for students may be greater, perhaps increasing the risk of infection after extraction. Prolonged procedure time has been identified as a significant risk factor for the development of postoperative problems during oral surgery [30].

The most common reason for extraction was pericoronitis, which had the highest rate of postoperative infection (13.3 %). This could be the result of an infection that existed prior to the extraction. An increased risk of postoperative inflammatory problems following third molar operations has been linked to preexisting infection and pathology [13, 28].

In this study, we also discovered that the incidence of postoperative infection was nearly identical in both genders. However, according to prior studies, women are eight times more likely than males to experience a dry socket [31]. Furthermore, patients in good health and those with pre-existing medical conditions like hypertension or diabetes had the same postoperative infection rate. Despite the fact that significant medical history has been shown to increase the risk of infection [13, 29], we considered the possibility that the medically compromised patients in our study had their medical conditions under control on the day of their extraction and thus presented as complication-free during their follow-up appointment.

Only one factor, "complexity of extractions," was related with a significantly elevated risk of postoperative infection (OR = 2.03, p = 0.004) among the factors for which data were retrieved. We found no significant link between the occurrence of postoperative infection and the remaining parameters of age, sex, operator, and the indication for the extraction or antibiotic therapy ($p>0.05$).This could be owing to the procedure's increased difficulty, which includes a flap incision, bone removal, and tooth sectioning. According to several studies, longer procedures result in more painful sockets [5, 32–34]. Other studies, on the other hand, found that age was the only relevant predictor, with older patients having the highest rate of infection after tooth extractions [11, 35]. This disparity could be explained by the fact that our study looked at all types of extractions, whereas the 2016 study only looked at third molar procedures (complex extractions).

Dry socket is the most common complication following tooth extraction; the exact cause of this issue is unknown, however an increase in fibrinolytic activity is widely thought to be the key etiologic component that causes the blood clot to dissolve. Dry socket was minimised when anti-fibrinolytic drugs were administered at the site of tooth extraction, according to Momeni H. et al. [20].

Furthermore, some studies have shown a link between dry socket and smoking [21,22]; cigarette smoking lowers post-operative socket filling with blood, which slows wound healing [23]. Furthermore, nicotine, which is a cytotoxic agent [24], interferes with the expression of a number of genes that are important for the development of new capillaries and bone healing, resulting in an enhanced catabolic response that may be detrimental to new bone production and wound healing [25].

The % age of persons who smoked was 29.7 % in this retrospective analysis, but if we just include patients who had post-surgical problems, the rate of smokers is much higher (52 %).

Nonetheless, some writers claim that dry socket is more common following traumatic tooth extractions (e.g., surgical extractions), but not in smokers [26].

The presence of coagulopathy, smoking habit, and the reason for extraction, in particular periodontitis, caries, fracture, and abscess, were all linked to the development of post-operative complications and alveolitis, according to the results of the multiple backward logistic regressions presented in this study.

Almost all surgical sites were sutured in this study, and the number of post-operative problems was relatively low. According to the literature, after a tooth extraction, the socket heals with the creation of a stable clot, migration of epithelium onto the clot, and remodelling of the alveolar bone; as a result, sutures placed over the site may help to maintain the clot and aid socket recovery [27].

According to the literature, the rate of post-surgical complications after oral surgery in patients with head and neck cancer ranged from 10% to 45 % [28]; however, the %age of all post-surgical difficulties in our group was only 3.17 %. The coat's stability is assured by stitches, which could explain this finding. The use of local hemostatic agents, sutures, and tranexamic acid reduced the incidence of postoperative bleeding after tooth removal in patients receiving anticoagulant therapy, according to Svensson R et al. [29,30].

The efficacy of tranexamic acid application after tooth extraction to promote wound healing and prevent post-surgical complications such as alveolitis was reported by Anaand KP et al. [31], which is consistent with the correlation between the presence of coagulopathy and the development of alveolitis found in this study. Coagulation disorders prevent the creation of a stable blood clot, and because the initial blood clot formed inside the alveolar socket disintegrates, the socket fails to repair, dry socket develops.

Model 2 of the multiple backward logistic regression shows a link between polypharmacological treatment, concurrent chemotherapy, and the execution of osteoplasty and the occurrence of post-operative problems (including alveolitis).

Pharmacologic therapies such as antiplatelet/anticoagulant/antihypertensive drugs can affect bleeding after dental extractions; literature reports show that dental extractions can be performed safely in patients on antiplatelet therapy [32] without withdrawal therapy because stopping antiplatelet therapy puts the patient at a higher risk of cardiovascular events [33,34] than the intervention itself. Patients taking antiplatelet or anticoagulant medicines or suffering from hypertension made up 18.1 %, 7.9 %, and 33.8 % of the study participants, respectively, with a reported bleeding rate of 0.4 %.Before conducting the extraction, the International Normalized Ratio (INR) was assessed for each patient who was starting anticoagulant treatment, and if it was higher than 3.5, the procedure was postponed.

The results show that dental extractions can be performed safely in these individuals [35], as none of the patients had ceased antiplatelet or anticoagulant therapy before the procedure.

Surgical trauma, dose of anaesthesia, site and number of extractions, age, sex, medical history and systemic disorders, operator experience and difficulty of the surgery, antibiotics use prior to surgery, previous infection of the surgical site in addition to oral contraceptives, menstrual cycle, and immediate post-exodontia were among the risk factors identified by Tarakji B et al. [30] in their systematic review."Presence of coagulopathy," "smoking habit," "surgical trauma" (where the reason for extraction was tooth fracture), and "prior odontogenic abscess" were the only factors linked to the development of alveolitis in this study [36].

CONCLUSION

Periodontal disease and caries were the most common causes of tooth extraction. dry socket was the most common post-operative complication. Surgical trauma should be minimized with an appropriate surgical technique. Patients follow post-operative instructions such as quitting smoking and avoiding mouth rinses, complications can be avoided. Antibiotics, whether given before or after a tooth extraction, do not appear to be useful in avoiding post-surgical problems, according to our findings.

REFERENCES

1. *Kawachi I., Kennedy B.P. Income inequality and health: Pathways and mechanisms. Health Serv. Res. 1999;34:215–227.*
2. *Neto J.M.S., Nadanovsky P. Social inequality in tooth extraction in a Brazilian insured working population. Community Dent. Oral Epidemiol. 2007;35:331–336. doi: 10.1111/j.1600-0528.2006.00335.x.*
3. *Slade G.D., Gansky S., Spencer J. Two-year incidence of tooth loss among South Australians aged 60+ years. Community Dent. Oral Epidemiol. 1997;25:429–437. doi: 10.1111/j.1600-0528.1997.tb01734.x.*
4. *Chrysanthakopoulos N.A. Reasons for extraction of permanent teeth in Greece: A five-year follow-up study. Int. Dent. J. 2011;61:19–24. doi: 10.1111/j.1875-595X.2011.00004.x.*
5. *Angelillo I.F., Nobile C.G., Pavia M. Survey of reasons for extraction of permanent teeth in Italy. Community Dent. Oral Epidemiol. 1996;24:336–340. doi: 10.1111/j.1600-0528.1996.tb00872.x.*
6. *Jafarian M., Etebarian A. Reasons for extraction of permanent teeth in general dental practices in Tehran, Iran. Med. Princ. Pract. 2013;22:239–244. doi: 10.1159/000345979.*
7. *Morita M., Kimura T., Kanegae M., Ishikawa A., Watanabe T. Reasons for extraction of permanent teeth in Japan. Community Dent. Oral Epidemiol. 1994;22:303–306. doi: 10.1111/j.1600-0528.1994.tb02056.x.*
8. *McCaul L.K., Jenkins W.M., Kay E.J. The reasons for extraction of permanent teeth in Scotland: A 15-year follow-up study. Br. Dent. J. 2001;190:658–662. doi: 10.1038/sj.bdj.4801068.*
9. *Klock K.S., Haugejorden O. Primary reasons for extraction of permanent teeth in Norway: Changes from 1968 to 1988. Community Dent. Oral Epidemiol. 1991;19:336–341. doi: 10.1111/j.1600-0528.1991.tb00183.x.*

10. *Christian L.M., Iams J., Porter K., Leblebicioglu B. Self-rated health among pregnant women: Associations with objective health indicators, psychological functioning, and serum inflammatory markers. Ann. Behav. Med. 2013;46:295–309. doi: 10.1007/s12160-013-9521-7.*
11. *Azzolino D., Passarelli P.C., De Angelis P., Piccirillo G.B., D'Addona A., Cesari M. Poor Oral Health as a Determinant of Malnutrition and Sarcopenia. Nutrients. 2019;11:2898. doi: 10.3390/nu11122898.*
12. *Papi P., Letizia C., Pilloni A., Petramala L., Saracino V., Rosella D., Pompa G. Peri-implant diseases and metabolic syndrome components: A systematic review. Eur. Rev. Med. Pharmacol. Sci. 2018;22:866–875. doi: 10.26355/eurrev_201802_14364.*
13. *Passarelli P.C., Pasquantonio G., Manicone P.F., Cerroni L., Condo R., Mancini M., D'Addona A. Orofacial signs and dental abnormalities in patients with Mulvihill-Smith syndrome: A literature review on this rare progeroid pathology. Medicine (Baltimore) 2018;97:0656. doi: 10.1097/MD.0000000000010656.*
14. *Bollero P., Passarelli P.C., D'Addona A., Pasquantonio G., Mancini M., Condò R., Cerroni L. Oral management of adult patients undergoing hematopoietic stem cell transplantation. Eur. Rev. Med. Pharmacol. Sci. 2018;22:876–887. doi: 10.26355/eurrev_201802_14365.*
15. *Olley R.C., Renton T., Frost P.M. Observational study investigating tooth extraction and the shortened dental arch approach. J. Oral Rehabil. 2017;44:610–616. doi: 10.1111/joor.12523.*
16. *Giannobile W.V., Braun T.M., Caplis A.K., Doucette-Stamm L., Duff G.W., Kornman K.S. Patient stratification for preventive care in dentistry. J. Dent. Res. 2013;92:694–701. doi: 10.1177/0022034513492336.*
17. *Lalla E., Papapanou P.N. Diabetes mellitus and periodontitis: A tale of two common interrelated diseases. Nat. Rev. Endocrinol. 2011; 7:738–748. doi: 10.1038/nrendo.2011.106.*
18. *De Angelis P., Passarelli P.C., Gasparini G., Boniello R., D'Amato G., De Angelis S. Monolithic CAD-CAM lithium disilicate versus monolithic CAD-CAM zirconia for single implant-supported posterior crowns using a digital workflow: A 3-year cross-sectional retrospective study. J. Prosthet. Dent. 2020;123:252–256. doi: 10.1016/j.prosdent.2018.11.016.*
19. *Kisely S., Sawyer E., Siskind D., Lalloo R. The oral health of people with anxiety and depressive disorders—A systematic review and meta-analysis. J. Affect. Disord. 2016;200:119–132. doi: 10.1016/j.jad.2016.04.040.*
20. *Moro A., De Angelis P., Pelo S., Gasparini G., D'Amato G., Passarelli P.C., Saponaro G. Alveolar ridge augmentation with maxillary sinus elevation and split crest: Comparison of 2 surgical procedures. Medicine (Baltimore) 2018;97:11029. doi: 10.1097/MD.0000000000011029.*
21. *Saccomanno S., Passarelli P.C., Oliva B., Grippaudo C. Comparison between Two Radiological Methods for Assessment of Tooth Root Resorption: An In Vitro Study. Biomed. Res. Int. 2018;2018:5152172. doi: 10.1155/2018/5152172.*
22. *Da'ameh D. Reasons for permanent tooth extraction in the North of Afghanistan. J. Dent. 2006;34:48–51. doi: 10.1016/j.jdent.2005.02.009.*

23. *Miller E.L. Systems for classifying dentulous arches. J. Prosthet. Dent. 1970;24:25–40. doi: 10.1016/0022-3913(70)90271-4.*

24. *Passarelli P.C., De Angelis P., Pasquantonio G., Manicone P.F., Verdugo F., D'Addona A. Management of Single Uncomplicated Dental Extractions and Postoperative Bleeding Evaluation in Patients With Factor V Deficiency: A Local Antihemorrhagic Approach. J. Oral Maxillofac. Surg. 2018;76:2280–2283. doi: 10.1016/j.joms.2018.06.022.*

25. *Passarelli P.C., Pasquantonio G., D'Addona A. Management of Surgical Third Lower Molar Extraction and Postoperative Progress in Patients with Factor VII Deficiency: A Clinical Protocol and Focus on This Rare Pathologic Entity. J. Oral Maxillofac. Surg. 2017;75:e1–e4. doi: 10.1016/j.joms.2017.06.010.*

26. *Passarelli P.C., Lajolo C., Pasquantonio G., D'Amato G., Docimo R., Verdugo F., D'Addona A. Influence of mandibular third molar surgical extraction on the periodontal status of adjacent second molars. J. Periodontol. 2019;90:847–855. doi: 10.1002/JPER.18-0415.*

27. *Trovik T.A., Klock K.S., Haugejorden O. Trends in reasons for tooth extractions in Norway from 1968 to 1998. ActaOdontol. Scand. 2000;58:89–96. doi: 10.1080/000163500429343.*

28. *Agerholm D. Reasons for extraction by dental practitioners in England and Wales: A comparison with 1986 and variations between regions. J. Dent. 2001;29:237–241. doi: 10.1016/S0300-5712(01)00013-6.*

29. *Al-Shammari K.F., Al-Ansari J.M., Al-Melh M.A., Al-Khabbaz A.K. Reasons for tooth extraction in Kuwait. Med. Princ. Pract. 2006;15:417–422. doi: 10.1159/000095486.*

30. *Hull P.S., Worthington H.V., Clerehugh V., Tsirba R., Davies R.M., Clarkson J.E. The reasons for tooth extractions in adults and their validation. J. Dent. 1997;25:233–237. doi: 10.1016/S0300-5712(96)00029-2.*

31. *Murray H., Locker D., Kay E.J. Patterns of and reasons for tooth extractions in general dental practice in Ontario, Canada. Community Dent. Oral Epidemiol. 1996;24:196–200. doi: 10.1111/j.1600-0528.1996.tb00841.x.*

32. *Haddad I., Haddadin K., Jebrin S., Ma'Ani M., Yassin O. Reasons for extraction of permanent teeth in Jordan. Int. Dent. J. 1999;49:343–346. doi: 10.1111/j.1875-595X.1999.tb00535.x.*

33. *Ong G., Yeo J.F., Bhole S. A survey of reasons for extraction of permanent teeth in Singapore. Community Dent. Oral Epidemiol. 1996;24:124–127. doi: 10.1111/j.1600-0528.1996.tb00828.x.*

34. *Chestnutt I.G., Binnie V.I., Taylor M.M. Reasons for tooth extraction in Scotland. J. Dent. 2000;28:295–297. doi: 10.1016/S0300-5712(99)00069-X.*

35. *Reich E., Hiller K.A. Reasons for tooth extraction in the western states of Germany. Community Dent. Oral Epidemiol. 1993;21:379–383. doi: 10.1111/j.1600-0528.1993.tb01103.x*

36. *Grossi S., Genco R.J., Machtei E.E., Ho A.W., Koch G., Dunford R., Zambon J.J., Hausmann E. Assessment of risk for periodontal disease. II. Risk indicators for alveolar bone loss. J. Periodontol. 1995;66:23–29. doi: 10.1902/jop.1995.66.1.23.*

FIGURES

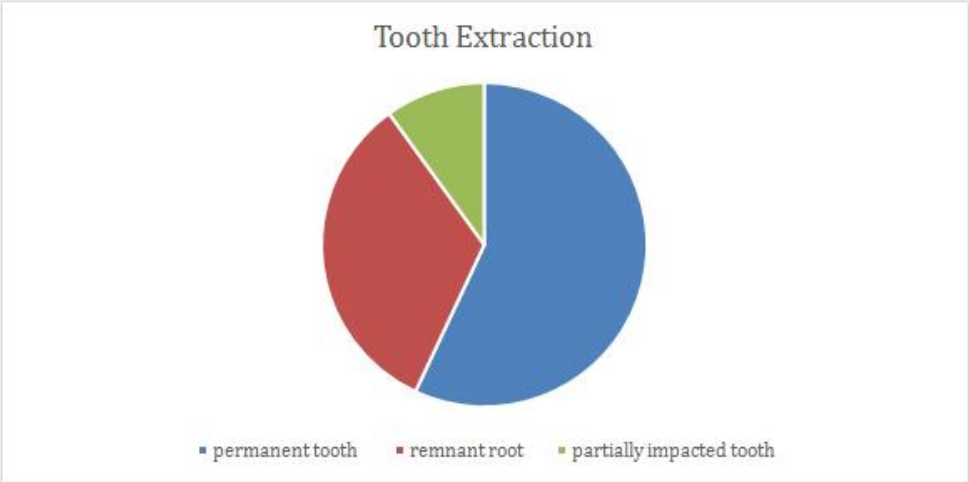

Figure 1: Tooth Extraction.

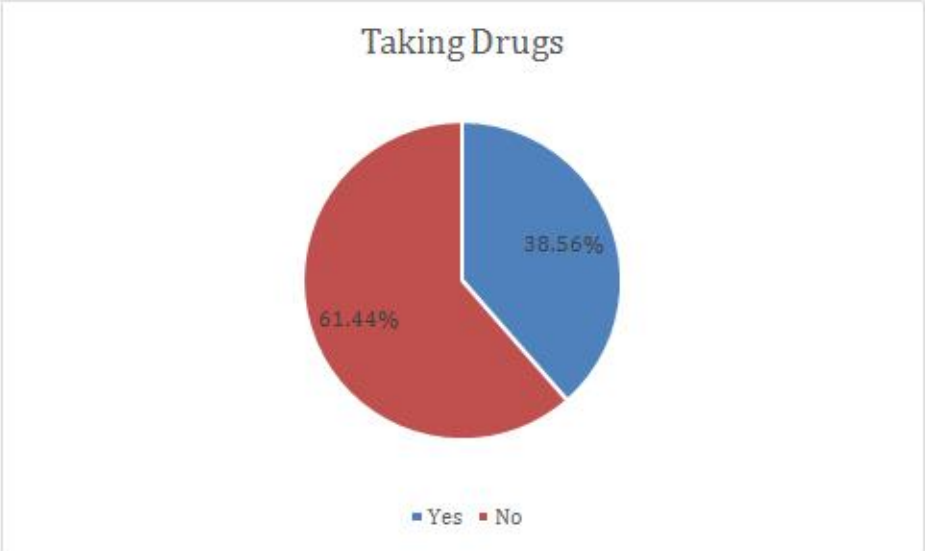

Figure 2: Taking Drugs.