



## Post extraction complications - An institution based retrospective study

Md Sohaib Shahzan<sup>1</sup>, Madhulaxmi Marimuthu<sup>\*2</sup><sup>1</sup>Saveetha dental college, Saveetha Institute of medical and Technical Sciences (SIMATS), Saveetha University, Chennai – 600 077, Tamil Nadu, India<sup>2</sup>Department of Oral Surgery, Saveetha Dental College, Saveetha Institute of Medical and Technical Sciences (SIMATS), Saveetha University, Chennai – 600 077, Tamil Nadu, India

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### ABSTRACT

Tooth extraction is one of the most common procedures undertaken in the dental clinic. As with any surgical procedure, even a simple tooth extraction can result in complications. Post extraction complications can be annoying to the patient, thereby causing mild morbidity and have an impact on their quality of life. Complications are wide starting from common ones like alveolitis and root fracture, dry socket, infection, halitosis, pain, trismus and uncommon ones like displacement of root fragments within the sinus and oral antral fistula. The aim of this study was to evaluate post-extraction complications among patients visiting saveetha dental college. This is a retrospective study. We reviewed patient records and analysed the data of 86000 patients between June 2019 and March 2020. From a pooled sample size of 23000 extractions done during this period, data of patients reporting for post-extraction complications were segregated and analysed. The statistical analysis was done using SPSS Version 20 by IBM. The results were analysed using the chi-square test. In this study, we observed that among a sample of 23000 simple extractions, only 42 patients had reported back with post-extraction complications (0.18%). These complications were more in males than in females. When compared between maxillary and mandibular arch, the mandible had more incidence with 54.16%. The most common complication was dry socket (58.34%). Pain as a complication was more in males than in females. Within the limits of the study, the incidence of post-extraction complication is more in males than females. Higher incidence of complication was seen in a mandibular arch (54.16%) than in maxillary arch (45.84%).

### \*Corresponding Author

Name: Madhulaxmi Marimuthu  
Phone: +91 7373814000  
Email: madhulaxmi@saveetha.com

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### INTRODUCTION

Tooth extraction is one among the common procedures undertaken in dental clinics (Jesudasan *et al.*, 2015; Pacheco-Vergara and Cartes-Velásquez, 2016; Patturaja and Pradeep, 2016). Post extraction complications generally don't occur. However, there are times when the dentist is faced with post-extraction complications. Complications are unforeseen events that tend to extend from a specific operative procedure under normal circumstances (Sheppard, 1997; Kumar and Rahman, 2017).

Though they are rare, their occurrences result in a protracted phase of treatment, which is cumbersome.

some to the patient and also to the clinician. Thus it becomes imperative that the clinician is aware and recognises the entire spectrum of complications and their implications. Complications are often wide, starting from common ones like alveolitis and root fracture to uncommon ones like displacement of a root fragment within the sinus and oro-antral fistula. Disturbed healing can also complicate or even jeopardize dental implant placement and other procedures (Giglio, 1993; Christabel, 2016). Alveolar osteitis (AO) is the most common and most widely discussed in the literature and is sometimes confused with other less common complications (Akota et al., 1998; Marimuthu, 2018). Pain is a natural bodily response to noxious stimuli (Cheung, 2001; Packiri, 2017). In post-extraction wound healing, pain is a key factor alerting patients to seek professional care out of concern for disturbing healing. Normal, uncomplicated alveolus healing has also been reported to cause moderate to severe pain (Cheung, 2001). The aim of this study was to analyze the incidence of post-extraction complication among patients visiting Saveetha Dental College in a period of 1 year.

**MATERIALS AND METHODS**

This is a retrospective study done among patients who visited Saveetha Dental College and Hospitals during the period of June 2019 to March 2020. From a pooled sample size of 23000 extractions done during this period, data of patients reporting for post-extraction complications were segregated and analysed. The approval for this university setting study was obtained from the Institution Ethics Board.

**Inclusion criteria** - Patients over 18 years, medically fit and healthy with no comorbidities, patients who reported with pain/swelling/open extraction wound/difficulty in mouth opening and any other complaints after simple dental extraction.

**Exclusion criteria** -Patients less than 18 years, medically compromised patients and patients who underwent trans alveolar extractions.

We reviewed patient records and analysed the data of 86000 patients between June 2019 and March 2020. The parameters studied and tabulated included age, gender, teeth extracted and type of complications. The data was reviewed by 2 reviewers.

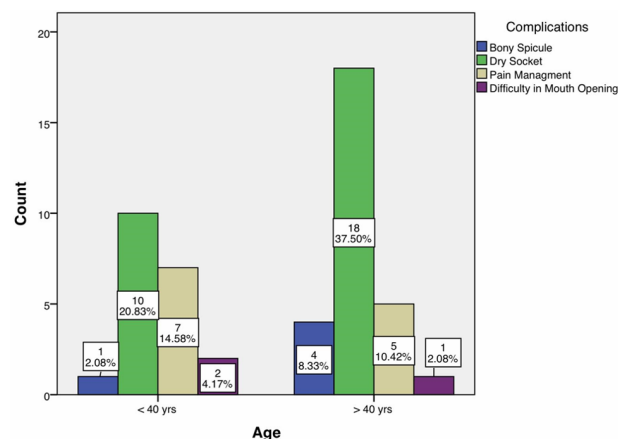
**Statistical analysis**

After further verification by an external reviewer, it was imported to the SPSS Version 20 by IBM for statistical analysis. Percentages, mean, standard deviation, frequency of parameter were employed in the

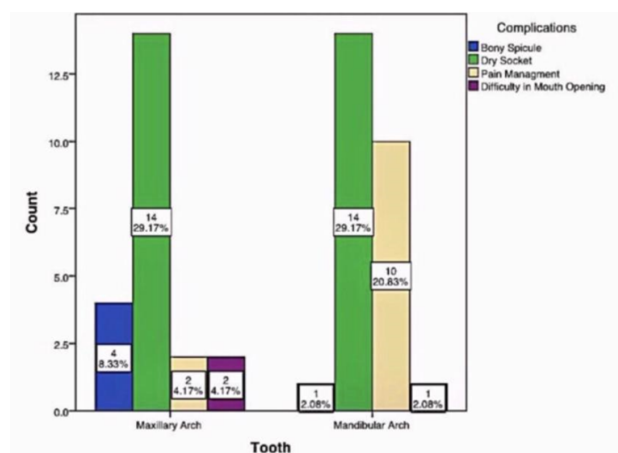
analysis. Chi-square test was used to detect the significance between age, gender, site and various complications.

**RESULTS AND DISCUSSION**

Post extraction complications were more in the age group above 40 years. Bony spicules, pain management and dry socket were seen more in this age group. The most common complication in both age group was the dry socket. There were 2 cases of trismus reported in the age group below 40 years and 1 case in the age group above 40 years (Graph 1).

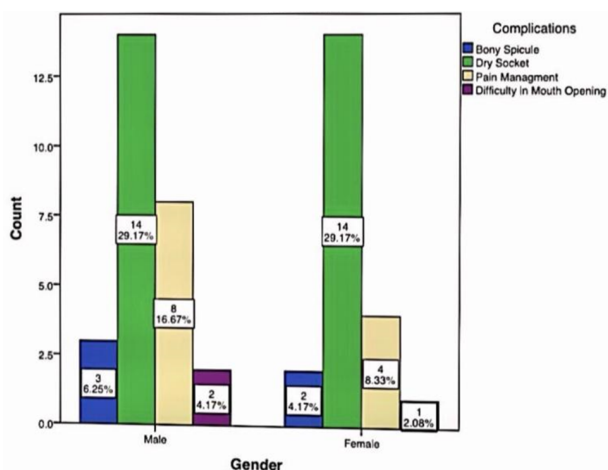


Graph 1: Bar chart depicting the post-extraction complications in different age groups



Graph 2: Bar chart depicting the distribution of post-extraction complications in the maxillary and mandibular arch

Most complications were in mandibular arch than in maxillary arch (Graph 2). This can be attributed to the anatomical blood supply to maxilla vs the mandible. It can also be due to more extractions done in mandibular arch than the maxillary arch. Though this observation can be of clinical significance, there was no statistically significant differ-



Graph 3: Bar chart depicting the post-extraction complications in male and female patients

ence in complications occurring in maxillary vs the mandibular.

Prevalence of complications was more in males than in females. Two cases of trismus were reported in males and one case in females. 3 cases of bony spicules were reported in males and 2 cases in females. The same number of cases of the dry socket was reported in males and females (Graph 3).

Surgery and complications go hand in hand. A dental extraction is a minor surgical procedure which can lead to complications. However, careful attention to surgical details, including proper patient preparation, asepsis and meticulous management of hard and soft tissue, controlled force when applying surgical instruments, hemostatis and adequate post-operative instruction may help to reduce the rate of complications, though it has not been found to eliminate it (?).

The factors that contribute to such complications are numerous and include the patient's compliance and general medical and oral health, the difficulty of extraction, surgeons operative experience, etc. (Sisk *et al.*, 1986; Sheppard, 1997; Kumar and Sneha, 2016). Other factors found to affect the complication rate include age and gender of the patient (Lyons, 1980; Capuzzi *et al.*, 1994).

The study sample included were patients mostly treated by dental graduate students. As the study was done in a university setting, materials used for extraction, technique and post-operative medications were standardised. The study shows higher incidence of dry socket (58.34%), pain management (25%), bony spicules (10.41), trismus (6.25%).

The dry socket was the most common complication (Adeyemo *et al.*, 2006; Abhinav *et al.*, 2019).

Similar results were observed in a study by Adeyemo *et al.* (Adeyemo *et al.*, 2006). In a histological study, Amler reported AO results from disturbances in the progression of healing from blood clot to granulation tissue. Failure or interference in the mechanism of the granulation tissue development to replace the clots results in the disintegration of the blood clot by putrefaction rather than by orderly resorption, giving rise to the well-known symptoms of dry socket (Amler, 1999).

Postoperative pain management was more in males than in females. This may be due to various habits like smoking, alcohol, tobacco, which are more common in males than in females (Abhinav *et al.*, 2019; Kumar, 2017b,c). And, also pain tolerance is generally said to be more in females than in males. And, there are many studies which show that men more often complained of postoperative pain than women (Ahuja, 2017; Cohen and Simecek, 1995). The proper analgesic protocol can be taken to reduce pain (Kumar and Sneha, 2016; Kumar, 2017a; Rao and Kumar, 2018). Regardless of pain severity, one should seek to optimize "around-the-clock" dosages of these agents and then, if necessary, add an opioid to the regimen as needed for breakthrough pain (Becker, 2010).

The percentage of bony spicules was found to be 10.41%. After tooth extraction, bone spicules should be removed, because they may result in an obstruction in placing a prosthetic restorative appliance. Alveoloplasty can be done to remove bony spicules prior to prosthetic rehabilitation (Devaki, 2012; Jain, 2019).

Incidence of trismus was found to be 6.25%. The factors contributing to trismus are Low-grade infection post administration of local anesthetic agents. Multiple needle penetrations correlate with a greater incidence of post-injection trismus. This complication is especially noted when injections were given using a barbed needle. The most commonly involved muscle is medial pterygoid during an inferior alveolar nerve (IAN) block (Balakrishnan, 2017). It has been hypothesised that trauma to this muscle, can cause micro bleeding, hematoma formation and trismus. Elevation of flap beyond the external oblique ridge can also result in postoperative edema and thereby pain and difficulty while opening the mouth (Patil, 2017).

At times, the patient hurts his/her own tongue or cheek under the effect of anesthesia resulting in reflex trismus (Balakrishnan, 2017). Physiotherapy treatments may be required to establish normal function (exercises will include neck stretching, chin tuck, massaging of masticatory muscles, and

other jaw stretching). Mandibular opening devices might be considered in some cases, but most likely provided by a physiotherapist or dental specialist (American Academy of Orofacial Pain, 2013).

Complications were more in the age group above 40 the older adults than in the age group below 40 the younger adults (Ahuja, 2017). The possible reasons might be due to decreased healing potential and dense bone (Phillips *et al.*, 2003). Increase in neurosensory problems in patients above 24 years was reported in a study (Blondeau and Daniel, 2007). Post extraction complications were more prevalent in males than in females. As mentioned earlier, this may be due to various habits in males. However, there are studies which show that complications are more in females than in males (Anyanechi and Saheeb, 2016).

A higher incidence of complication was seen in extraction carried out in mandible (54.16%) as compared to the maxilla (45.84%). This may be due to anatomical factors, including dense cortical bone and comparatively lesser vascularity in the mandible as compared to the maxilla, which has a good blood supply (Khosla *et al.*, 2011).

## CONCLUSION

Within the limits of the study, the overall percentage of post-extraction complications are significantly very minimal (0.18%). Among those reported, post-extraction complications are more in older males and affecting the mandibular arch (54.16%). From this study, it can be inferred that proper surgical technique and protocols; post-extraction instructions; patient compliance and motivation with good analgesics prescribed postoperatively, complications can be avoided to a great extent in simple extractions.

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## Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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