

# Do Using Dental Elevators Increase the Chance of Complications in Undergraduate Exodontia Clinic?

Mazen Almasri\*

Oral Maxillofacial Surgery Department, Faculty of Dentistry, King Abdulaziz University, Jeddah, Saudi Arabia

\*Corresponding author: [malmasri@kau.edu.sa](mailto:malmasri@kau.edu.sa)

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**Abstract Objective:** To evaluate if using dental elevators increase the chances of immediate intraoperative complications (IOC) in undergraduate exodontia clinic. **Materials and Methods:** A prospective cross sectional study was conducted to evaluate the patients enrolled randomly into the 6<sup>th</sup> year exodontia clinic at the Faculty of Dentistry Health center in King Abdulaziz University (KAUFD) from the period of October to December 2017. A total of 330 cases were recorded at that period, aged from 23-71 years old, and the IOC that took place during the dental extractions were recorded and managed immediately. The pertinent information was collected and all the data obtained were tabulated and statistically analyzed using the Spearman's rank correlation coefficient / 2-Tailed test at the SPSS statistical software. **Results:** The incidence of IOC was found to be low, that represented 29 cases (8.8%) out of the 330, and all of them were in the form of minor incidents that were managed immediately. Although the incident sample was small, it was found that using forceps for dental extraction lead to significantly higher complication rate than using the elevators ( $P < 0.001$  and a Correlation of 0.813). Among the complications, gingival laceration (16 cases) were found to be the most to occur using both instruments and was found at the maxillary posterior region to be significantly higher than other complications recorded ( $P < 0.001$ , and a correlation of 0.933). **Conclusion:** The IOC rate at KAUFD undergraduate exodontia clinic is considered very low and minor in nature that were all managed conservatively in the office. The fear of using dental elevators is proven in our study to be a myth while a special care should be taken while extracting maxillary posterior teeth, is worthier. The compromised visibility and accessibility do contribute to the findings and hence the higher chances of minor gingival laceration to take place.

**Keywords:** *exodontia, dental extractions, elevators, forceps, complications, dental school*

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## 1. Introduction

Complications are not uncommon in any exodontia clinic not to mention in undergraduate dental clinics. Such complications can be categorized as immediate intraoperative (IOC), or delayed complications. The immediate ones can be in the form of major complications such as jaw fracture, severe bleeding, severe dental displacement, and damage to the neighboring tissues. While minor complications can be in the form of immediate root fracture, gingival laceration, minor alveolar bone fracture, and immediate root displacement. On the other hand, delayed complications can be in the form of bleeding, pain, dry socket, infected socket, osteomyelitis, or further delayed damage to the neighboring tissue. [1]

Oral and Maxillofacial Surgeons are the staff taking care of dental extraction (exodontia) including training dental undergraduates, postgraduates, running research projects, and conducting further related oral maxillofacial surgical patient care. In order to go through the proper

training in exodontia; the didactic line is always the starting point including anatomy, pain control, pharmacology, and oral surgical exodontia clinic management. Afterword, a stepwise clinical application comes gradually within the training exposure. [1,2]

Hence, the staff at the Oral Maxillofacial Surgery (OMFS) department in King Abdulaziz University (KAUFD) are keen to categorize the cases based on the difficulty levels among the senior dental undergrad levels (5<sup>th</sup> and 6<sup>th</sup> years, in KAUFD). All the cases are booked at the specialized OMFS clinic time and a close clinical supervision takes place throughout the procedure. In the literature, IOC can occur by using forceps or elevators without clear records about the incidence and the possible variables.

The myth and the exaggerated intimidation about using dental elevators in the undergraduate clinic has been challenged in our study, especially that no evidence lays behind it, and seems to be originated based on an anecdotal opinion that has been running in dental education for a while.

The study of medical morbidities and mortalities (AKA, M and Ms) in hospital and medical practice has been

always a successful way in transparent medical education and improving the health care practice. Understanding the reasoning, prevention strategies, and the way of management will improve the medical practice surely. [2]

The myth that directs using dental extraction forceps to be a safer technique while avoiding dental elevators lacks an evidence-based proof and is unrealistic. In our study, that myth has been investigated to show the complication rate and the related variables, for the first time in the region.

## 2. Materials and Methods

After getting an ethical approval from the KAUFU Research units, A prospective observational study took place at the final dental training level in KAUFU (6th year), exodontia clinic. A-330 patients were admitted into the exodontia clinic from October to December 2017. All the cases were carefully examined by the staff of the OMFS department and approved for the procedures. The students were instructed to go over the treatment plan before commencing any surgical intervention to assure safe and predictable surgical interventions. The IOCs that happened during the extraction were examined, and managed by the supervising staff safely.

All the variables were recorded including the instruments used and the location of extracted teeth. The population age varied from 23 to 71 years old, and all the patients were medically competent for the procedures.

All the data were tabulated, categorized, and analyzed using the SPSS statistics software.

## 3. Results

Looking at the frequencies and the Spearman's rank correlation coefficient/2-Tailed test at the SPSS statistical

software, there were 29 cases (8.8%) out of 330 teeth suffered from IOC. (Figure 1)

Most complications that occurred were gingival lacerations (n=16; 55.17%) followed by root fractures (n=10; 34.48%), and we found that most of the former were caused by elevators and most of latter were due to forceps. (Figure 2).

Although the incidental sample is small, Forceps extraction IOC were found to be significantly higher than elevators (P< 0.001 and a Correlation of 0.813). Such might be due to the more frequent use of forceps over starting the extraction cases using elevators.

Among the complication items and the location correlation; gingival laceration (16 cases, 55.17%) were found to be most commonly to occur using either instruments with slight predilection toward elevators. It was found that IOC at the maxillary posterior region is significantly higher than any other locations recorded (P<0.001, and a correlation of 0.933), followed by the location at the mandibular posterior region (P<0.001, correlation 0.705). The maxillary anterior region had very few incidents and non-was recorded at the anterior mandibular region. (Figure 2)

Luckily, the incident of the other IOC such as dental displacements and alveolar bone fractures were significantly low. (Figure 2)

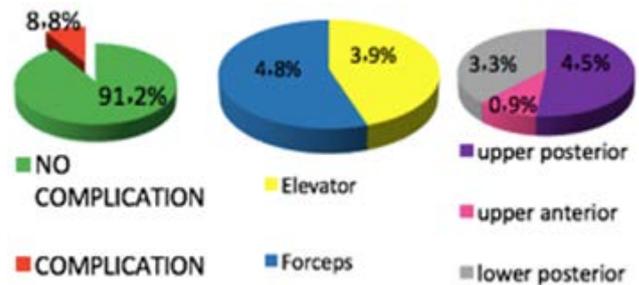


Figure 1. The complication rate that took place in the study

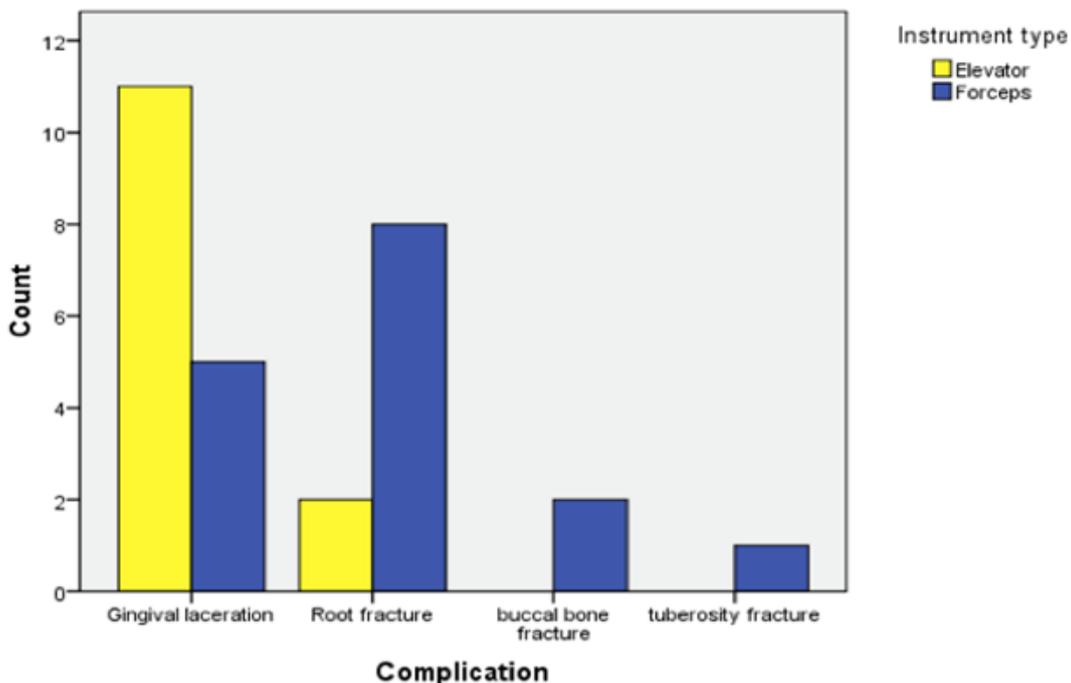


Figure 2. The incidents of complication types and the correlation with the instruments used, forceps or elevators

## 4. Discussion

In undergraduate exodontia training clinic, safe practice has been always the most important factor to consider, however, complications might still arise. Complications in exodontia clinic can have a wide range of subcategories based on the severity, region, and timing. The aim of this study was to clearly evaluate the immediate local complication that might arise due to the application of dental elevators by students. [1,2]

After looking in the literature under the designated keywords in pubmed, 96 reports were published only. It was found that most of the reports discussed delayed complications such as systemic complications, third molar extractions, dry sockets, healing of compromised sites, and bleeding tendencies in healthy and medically compromised patients. All the formers were ruled out in our study as we have been focusing on investigating the immediate complications in dental schools. Hence, few studies were revealed from different regions around the world.

It is well known among Oral Maxillofacial Surgeons, that the use of dental elevators is very practical and important to execute extraction procedures, just like if not more than using forceps [3]. Furthermore, dental graduates will be facing a lot of extraction cases especially if assigned in primary health care centers. Most of which might be in the form of multiple remaining roots that can be executed easily, safely, and quickly, using elevators. Therefore, emphasizing the necessity of training students to use elevators and forceps efficiently and safely.

The literature had discussed thoroughly the delayed complications of exodontia, such as pain, dry sockets, infected sockets, and bleeding [4]. However, the immediate intraoperative complications, or as might be considered as intraoperative incidents, have not been discussed in depth. It was revealed in our study, that most of the cases went through the clinical exodontia practice safely without apparent problems. Few cases only showed minor intraoperative pitfalls. The rate of complications in our series is 29 cases only out of the 330 (8.8%), which were found to be lower than other studies in the literature, reaching up to 64% in some dental schools. [5]

Most of the complications that took place in our undergraduate clinic are gingival laceration (55.17%), followed by root fracture (34.38%). This might be referred to the hesitation of students to elevate better gingival flaps. And such can be an area of training focus in the future. Especially after understanding that the expertise in oral surgical specialty is inversely related to the degree of possible complications. [4]

Most of the IOC took place at the maxillary posterior region. This was seen too at another school in Indonesia, Padjadjaran University, and might be due to the challenging visibility, accessibility, and the posture control [5]. Hence,

considering this fact while categorizing the case difficulty levels for training different student levels.

## 5. Conclusion and Recommendations

- It was revealed that intimidating students from using elevators should be abandoned and must be replaced with clear training in exodontia practice. Such can lead to better outcomes and time efficiency during oral surgical clinics.
- It is recommended to re-emphasize the factors that contribute to the exodontia difficulty levels and to teach some pertinent techniques to overcome such challenges.
- More emphasis in using conservative flap reflection to avoid traumatizing the gingival envelop in undergraduate clinics. In addition, the dental student should master the basics of suturing and the methods of reaching a stable postoperative hemostasis.
- The recommended stepwise training in undergraduate exodontia clinic should start with mandibular anterior teeth, maxillary anterior teeth, premolar teeth, mandibular posterior teeth, and finally the maxillary posterior teeth.

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