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ORIGINAL RESEARCH

Physics Forceps: A New Sensation in Exodontia?

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ABSTRACT

The study was conducted to investigate and compare the prevalence of complication (laceration of soft tissue) and time taken for a simple tooth extraction with the help of a universal extraction forceps and a physics forceps for mandibular single-rooted tooth. We organized a double-blind, randomized trial to compare the outcome of two groups (n = 50 mandibular single-rooted teeth). The physics forceps group had lower time coefficient (mean ± standard deviation of 1.868 ± 1.503), and when laceration was compared among the two groups, the p value came to be 0.032.

Aim: To evaluate and determine the efficacy of the physics forceps in nonsurgical mandibular single-rooted tooth extraction.

Keywords: Atraumatic extraction, Extraction forceps, Newer advancements, Operative complication, Physics forceps.

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INTRODUCTION

The use of a physics forceps is a revolutionary concept that enable to extract teeth more quickly, more efficiently, more predictably, and with less trauma for the patient.[1] They dramatically reduce the amount of time required to extract teeth and make the whole procedure more comfortable and pleasant for both the operator and the patient. The physics forceps (Fig. 1) is a device that uses a first-class lever mechanism for atraumatic extraction of a tooth from its socket.[2] There are two handles, one of which is connected to a bumper that functions as the fulcrum during extraction. It is applied to the buccolabial aspect, usually at the mucogingival junction. The other beak is applied to the palatolingual aspect of the tooth into the gingival sulcus, at a lower level than the bumper.[3] This "beak and bumper" design aids the extraction without the use of excessive force.

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MATERIALS AND METHODS

Fifty patients took part in this double-blind, randomized clinical trial**.** They had been referred to the Department of Oral and Maxillofacial Surgery, DJ College of Dental Sciences and Research, Modinagar, for extraction of mandibular single-rooted tooth. All were fully informed about the research and the patients or their parents gave their written consent.

Inclusion Criteria

Patients above 14 years of age who required extraction of mandibular single-rooted tooth were included in the study.

Exclusion Criteria

Medically compromised patients, those with periodontally weak teeth, were excluded.

Randomization

Randomization was done with a computer software www.randomization.com; after the procedure had been explained to the patient, the teeth were anesthetized using lignocaine 2% plus epinephrine 1:200,000 units as lignocaine 1.8 ml local anesthesia solution. In one group, mandibular single-rooted tooth as indicated for extraction were pulled out with a conventional forceps and in the other group with a physic forceps. The operating time was noted from the beginning of the extraction till the completion of the extraction and laceration was noted if present. Postoperative instructions were given after adequate hemostasis was ensured. Operative complications other

than laceration were noted, such as cortical plate fracture and tooth fracture. A simple yes/no format was used for the assessment.

RESULTS

The data were collected and evaluated in a computer-controlled Statistical Package for the Social Sciences (SPSS) program and using Pearson's chi-square, arithmetic mean, and standard mean. The p value came to be statistically significant.

Table 1 shows the comparison between the mean time taken for the extraction of a single-rooted tooth with a physics forceps and a conventional forceps, which was 1.868 minute with a physics forceps with a standard deviation of 1.503 minutes whereas with a conventional forceps the mean time was 2.584 minutes with a standard deviation of 1.831 minutes.

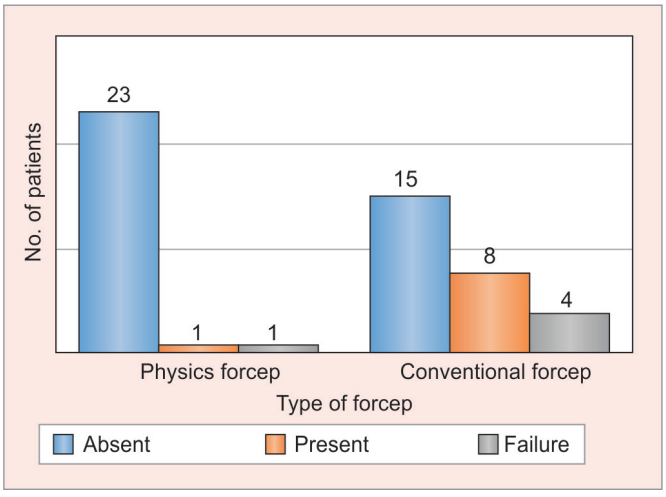
Table 2 and Graph 1 show the comparison between the test group and the control group based on the laceration of gingival tissue of the subjects who underwent single-rooted tooth extraction; less number of subjects reported laceration with the use of a physics forceps (test group); 23 out of 25 subjects reported no laceration whereas in 1 subject laceration was present, and in the control group (conventional forceps), 8 subjects reported the presence of laceration out of 25 patients and 2 subjects were reported as failure. A significant association was found in the laceration of gingival tissue between the two groups; $p \leq 0.032$.

Table 1: The mean and standard deviation of study subjects according to the time taken for the extraction of a single-rooted tooth

Groups	*Mean ± standard deviation*
Physics forceps	1.868 ± 1.503
Conventional forceps	2.584 ± 1.831

Table 2: Comparison of test group (physics forceps) and control group (conventional forceps) based on the laceration of gingival tissue

Laceration of gingival tissue	*Physics forceps*	*Conventional forceps*	*Chi-square value*	*p-value*
Absent	23	15	7.462	0.032
Present	1	8		0.01 < p ≤ 0.05
Failure	1	2		
Total	25	25		



Graph 1: Comparison of test group (physics forceps) and control group (conventional forceps) of patients who underwent single-rooted tooth extraction based on the laceration of gingival tissue

DISCUSSION

Over the last decade there has been an increased interest in atraumatic tooth extraction in order to maintain bone for implant insertion.[4] Recently, a revolutionary new concept and tooling in exodontia, the physics forceps (Fig. 1) from GOLDEN/MISCH, has been developed, which primarily uses the biomechanical advantages of a first-class lever, creep, and stress distribution without the squeezing, grasping, twisting, and pulling forces.[5]

Some of the many advantages of utilizing this technique and the physics forceps include[6]:

- Predictable and efficient extractions typically in less than 4 minutes
- Preserving the buccal bone and cortical plate
- Preventing having to lay flaps and removing bone to access roots
- Virtually eliminating root tip fractures
- Assisting with efficient full-mouth reconstructive extractions
- Supporting immediate implant placement.

Use of Innovative Physics Forceps for Extractions in Preparation for Dental Implants

Immediate placement of a dental implant following the extraction is primarily possible when the tooth is removed without complication or damage of the facial plate of the bone.[7]

The extractions using the physics forceps (Fig. 1) are predictable in time commitment, faster, and most assuredly, less traumatic physically and psychologically to the patient.[8]

The physics forceps has a definite learning curve because the method of delivering the tooth from the alveolus is so different.[9] Unlike the more conventional forceps, which is used for teaching in dental schools, the physics forceps is new, having only recently been introduced in the market; however, once the operator is familiar with the movement of the wrist and the direction of application of force, the process of extraction is simple. Other studies that have mentioned the physics forceps

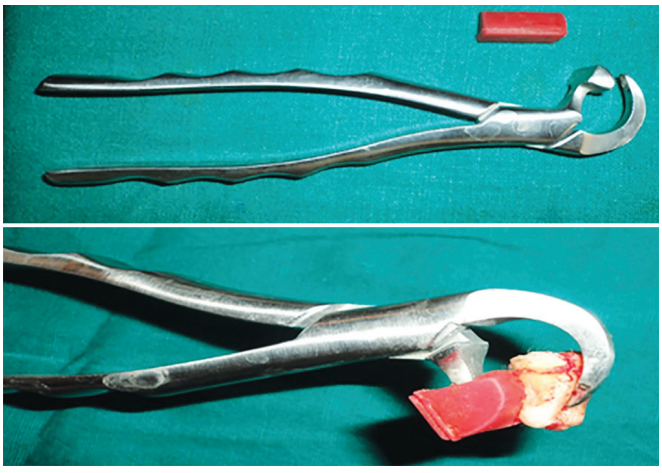


Fig. 1: Extraction of tooth using physics forceps

have been review studies and we know of no other comparative clinical studies, so there is a need for more prospective studies with larger number.

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