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Collate On the Ability of Physics Forceps V/S Conventional Forceps in Multirooted Mandibular Tooth Extractions

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Abstract: *Can physics forcep replace conventional forcep in non- surgical mandibular dental extraction?? To authenticate this query we compared outcome variables (laceration, cortical plate fracture, post-operative pain and complication) in patients being treated for their multirooted tooth extraction with the physics forcep and the conventional forcep. We organised a double blind, randomized controlled trial in which p value came to be statistically significant in support of physics forcep. (**p value** Laceration of gingival tissue 0.032, cortical plate fracture 0.001, post-operative pain 0.035 and average time taken for extraction was 2.33 with a standard deviation of ±1.588)*

Aim and Objective: *To evaluate efficacy of physics forcep in non-surgical mandibular multirooted tooth extractions.*

Keywords: *Physics Forceps, Atraumatic Extraction, Extraction Forceps, Recent advancement in extraction forcep*

I. Introduction

The history of dental extractions dates back to the days of Aristotle (384 to 322 BC), in which he described the mechanics of extraction forceps, including the advantages of "two levers acting in contrary sense having a single fulcrum.[1]

In the process of a simple extraction, surgeons must exercise a great deal of fineness and a certain degree of controlled force to deliver a simple tooth extraction.[2] Traditional extraction techniques use a combination of severing the periodontal attachment, luxation with an elevator, and removal with forceps. If the elevator fails to cause noticeable separation of the tooth from the socket, the forceps accomplish the work through intermittent apical and lateral forces. If the tooth is already weakened from endodontic treatment or decay, or if the roots are long and/or dilacerated, then traditional extraction forceps often cause fracture of the tooth, surrounding bone, or both. This can lead to a more involved surgical approach, accompanied by corresponding undesirable postoperative sequelae.[3] Biomechanical aspects of force have been applied to tooth extraction for centuries. However, the mechanical advantages available to extract the teeth were primarily applied to hold the crown of the tooth, rather than help extract it.[1]

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

II. Material And Methods

A prospective Double Blind, Randomized Controlled Trial was conducted in Department of Oral and Maxillofacial Surgery in DivyaJyoti College of Dental Sciences and Research (DJCDS&R), Niwari Road, Modinagar from Febuary 2014 to September 2014. 50 subjects were enrolled for the study consecutively who met inclusion and exclusion criteria. Written informed consent was obtained from all the subjects and the study received ethical clearance from the institution's (DJCDS&R) ETHICAL BOARD.

Inclusion Criteria:

- Subjects of both the gender
- Above 14 years of age
- Multirooted mandibular firm tooth

Exclusion criteria:

- Refused to sign the informed consent
- Existing moderate-severe infections
- Root stump
- Surgical extraction
- Periodontallyweak- grade II- III mobile

Subjects were randomized to two groups, **Test group (Physics forceps) and Control group (Conventional forceps**) using Computer Generated Randomized process with the help ofwww.randomization.com. Extraction was carried out under aseptic condition using localanaesthesia, 2% lignocaine with adrenaline and post-operative instructions were given to eachsubjects. Subjects were followed for a period of 3rd day and 7th day for evaluation of woundand pain score

III. Result

The Data was collected and was evaluated in a computer controlled programme SPSS and using Pearson's Chi Square, Arithmetic Mean and Standard Mean. p value came to be statistically significant. TABLE I represents the mean time taken for extraction of multirooted tooth with physics forceps and conventional forcep which comes to be 2.33 minute with physics forceps with a standard deviation of 1.588 minutes whereas with conventional forceps mean time came to be 3.94 minutes with a standard deviation of 2.145 minutes. TABLE II AND GRAPH I shows the comparison between the test group (physic forcep) and the control group (conventional forcep) for extraction of multirooted tooth on basis of laceration of gingival tissue. Lesser number of subjects reported laceration with the use of physics forcep (test group). Of the total 25 subjects in the test group, 18 subjects did not report any laceration, 3 subjects reported laceration in the test group as compared to 11 subjects of the total 25 subjects in the control group. 4 subjects were reported as failure. A significant association was found between the physcics forceps and conventional forecep. **p=<0.05.** TABLE III AND GRAPH II shows the comparison between test group (physics forcep) and the control group (conventional forcep) for extraction of multirooted tooth on basis of cortical plate fracture. In the test group 21 of the total 25 subjects did not report cortical plate fracture compared to 12 subjects reported with a cortical plate fracture out of 25 subjects who were in the control group. 4 subjects each in both the groups were not included in the study due to failure. A significant association was found. **P=<0.05.** TABLE IV AND GRAPH III shows the comparison of pain on the basis of FACIAL PAIN SCALE REVISED between test group (physics forcep) and the control group (conventional forcep) for multirooted tooth extraction for the postoperative pain after 3 days. It was seen that of the total 25 subjects in the test group (physics forcep) 17 reported no hurt whereas 8 subjects from control group reported no hurt, on comparing test group with control group on basis on little bit hurt result came to be that out of 25 subjects 6 subjects reported little bit hurt but in control group there were more number of subjects with a complain of little bit hurt. A significant relation was seen. **p =< 0.035**

IV. Tables And Graphs

GROUPS	MEAN±STANDARD DEVIATION
Physics Forceps	2.33±1.588
Conventional Forceps	3.94±2.145

Table I: Mean and standard deviation of study subject according to time taken for extraction of multirooted tooth.

Laceration of Gingival Tissue	Physics Forcep	Conventional Forcep	Chi SquareValue	P Value
Absent	18	10	6.857	0.032
Present	3	11		
Failure	4	4		**0.01<p □0.05**
Total	25	25		

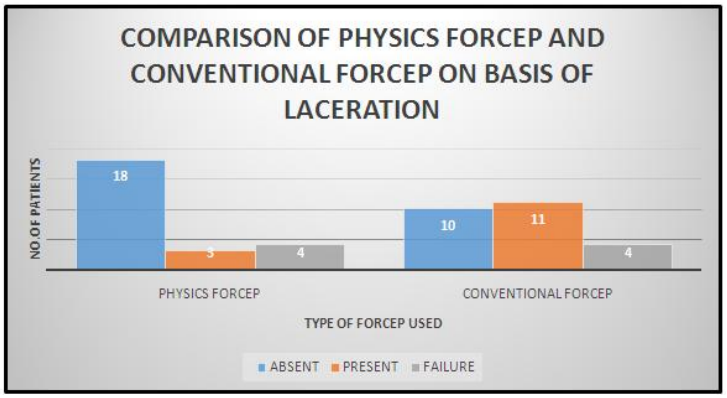
Table II: Comparison of Test Group (Physics Forcep) with Control Group (Conventional Forcep) of patients who underwent multiplerooted tooth extraction on Basis of Laceration of Gingival Tissue

CorticalPlate Fracture	Physics Forcep	Conventional Forcep	Chi SquareValue	P Value
Absent	21	9	16.800	0.001
Present	0	12		
Failure	4	4		**p □0.01**
Total	25	25		

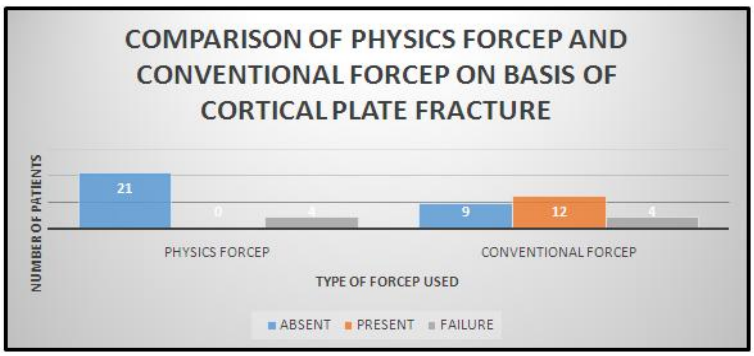
Table III: Comparison of Test group (Physics Forcep) and Control group (Conventional Forcep) on Basis of Cortical Plate Fracture of Patients who underwent Multirooted Tooth Extraction

F.P.S(R)	Physics Forcep	Conventional Forcep	Chi SquareValue	P Value
NO HURT	17	8	6.711	0.035
HURTS LITTLEBIT	6	11		
HURTS LITTLEMORE	2	6		**0.01<p □0.05**
Total	25	25		

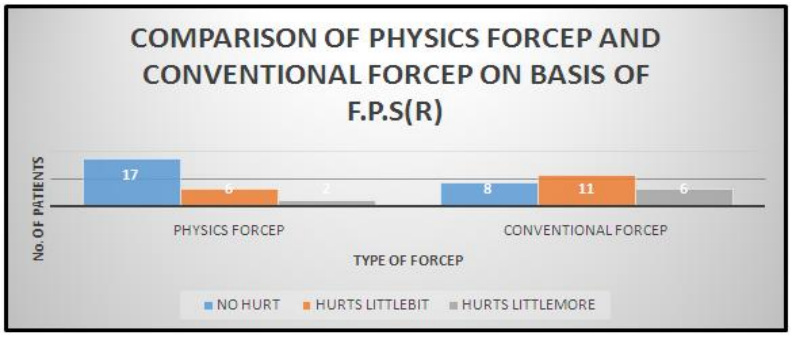
Table IV: Comparison of Test Group (Physics Forcep) and Control Group (Conventional Forcep) of patients who underwent Multirooted Tooth Extraction on Basis of F.P.S(R)



Graph I: Comparison Of Test Group (Physics Forcep) With Control Group (Conventional Forcep) Of Patients Who Underwent Multiplerooted Tooth Extraction On Basis Of Laceration Of Gingival Tissue



Graph II: Comparison Of Test Group (Physics Forcep) And Control Group (Conventional Forcep) On Basis Of Cortical Plate Fracture Of Patients Who Underwent Multirooted Tooth Extraction



GraphIII: Comparison Of Test Group (Physics Forcep) And Control Group (Conventional Forcep) Of Patients Who Underwent Multirooted Tooth Extraction On Basis Of Facial Pain Scale (Revised)

Fig.1

V. Discussion

It had been long since the traditional methods of extraction is to atraumatically loosen and dislodge the tooth without damaging the alveolar bone or supporting tissue. Abulkasim gave the concept of elevator by being first to apply a single lever under the tooth to force it from its bed.[1]

Traditional methods often result in damage ranging from mild gingival tissue laceration to complete loss of the buccal bony plate and interdentally bone crest.[5] Some of the other complications involves trismus, dry socket, post-operative pain and if a bony dehiscence exists apical to free gingival margin, or the labial bone is very thin, it may undergo significant resorption during natural healing process of socket.[6]

All these complication not only cause post-operative discomfort to the patient but also lead to difficulty in prosthetic replacement. Even the oral health related quality of life following nonsurgical routine tooth extraction is deteriorated.[7] Recently, a revolutionary new concept and tooling in exodontia the Physics forceps is developed which primarily uses the biomechanical advantages of a first-class lever, creep, and stress distribution without the squeezing, grasping, twisting and pulling forces,4 the extractions using the Physics Forceps are predictable in time commitment, faster procedures, and most assuredly, less traumatic physically and psychologically to the patient.[7] Principles of biomechanics were the basis for the development of the physics forceps, implementation of Ist class lever, creep and the type of force provides the mechanical advantages necessary to make this dental extraction device more efficient, the physics forceps is really a dental extractor rather than a forceps, one handle of the device is connected to a "bumper" which acts as a fulcrum during the extraction the beak of the extractor is positioned most often on the lingual or palatal root of the tooth and into the gingival sulcus, the bumper is most often placed on the facial aspect of the dental alveolus typically at the mucogingival junction. The handle are rotated as one unit for a few degrees and then the action is stopped for one minute. This process allows the tooth socket to expand and permits the tooth to exit the socket, when a rotating force is applied to the physics forceps on the tooth, the stress to the tooth and periodontal complex is a shear component of force. The force applied to the gum and bone by the bumper is over a greater surface area and is a compressive force, thus bracing the buccal bone, this permits the lingual plate to expand more and protects the facial plate from fracture.

We are of the opinion that physics forceps can be used as a helpful aid in atraumatic extraction of mandibular tooth, it not only reduces patient's post-operative discomfort but also maintain the socket integrity by not disturbing the soft tissue and hard tissue architecture and thus making future prosthesis replacement easier. There is still a need to conduct a trial with a greater number of patients and maxillary tooth extraction with physics forceps and associate the consequences with physics forceps.

References

[1]. Misch C, Perez H. Dentistry Today. August 2008; 27(8): 1-3.
[2]. Dym H, Weiss A. Exodontia: Tips and Techniques for Better Outcome. Dent Clin N Am. 2012; 56: 245-266.
[3]. Feck A. Predictable atraumatic dental extractions. Dental Economics. October 2010; 1-4
[4]. Misch G. Physics forceps. Dental product. 2009
[5]. Al-Khateeb TH. Pain Experience after Simple Tooth Extraction. Journal of Oral and Maxillofacial Surgery, Volume 66, Issue 5, Page 911-917, May 2008
[6]. Vankateshwar PG, Padhye NM, Khosla RA, Kakkar TS, Complications Of Exodontia: A Retrospective Study. Indian Journal Of Dental Research.2011; 22(5)
[7]. Wasiu L. Adeyemo, Olanrewaju A. Taiwo, Olabisi H. Oderinu, Moshood F. Adeyemi, Akinola L. Ladeinde And Mobolanle O. Ogunlewe. Oral Health Related Quality Of Life Following No- Surgical (Routine) Tooth Extraction:A Pilot Study. ContempClin Dent. Oct-Dec 2012; 3(4): 427-432
[8]. Golden R. Less than four minute extraction of any tooth. Dentistry Today. August 2011; 30(8)
[9]. Kosinski T. Use of Innovative Physics Forceps for Extraction in Preparation for Dental Implants. Implant News and Views. March / April 2012; 14(2): 1-9.
[10]. Scull P. Beak and Bumper. The Dentist. March 2010; 56-61.
[11]. Perkins NJ, Perez MH, Misch EC, Golden R, The Physics Forceps-A Breakthrough In Dental Extraction Technology. Posters/Br J Maxillofac Surg. 2010; 48: S25-S55.
[12]. Melville AN, Physics Forceps Take The Trauma Out Of Tooth Extractions. Dr.Bicuspid.Com, 2011 March 15, last accessed 10-11-2014.
[13]. Hariharan S, Vinod N, Soh LC, Split-Mouth Comparison Of Physics Forceps And
[14]. Extraction Forceps In Orthodontic Extraction Of Upper Premolars. Br J Oral and
[15]. Maxillofac Surg. 2014; 52: 137-140.
[16]. Miller SC. Textbook of Periodontia.3rd Edition Philadelphia: The Blakeston Co. 1950.
[17]. Huang LTKO, Wino C, Vreeman CR, Hagembe M, Njuguna F, R Matthew, Strother MR, Gramelspacher PG, Assessment Of The Face Validity Of Two Pain Scales In Kenya: A Validation Study Using Cognitive Interviewing. BMC Palliative Care. 2012; 11: 5.