

## Peer Review File

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### **REVIEWER 1:**

#### **COMMENT 1:**

Major grammatical errors and misspelling all over the manuscript. Suggest seek for English manuscript revision service.

REPLY 1: Grammar checked and the manuscript revised

CHANGES IN THE TEXT: Grammar checked and the manuscript revised

#### **COMMENT 2:**

Please describe the process of randomization in detail. Was this a split mouth design? How were the teeth or individuals randomized? What was the control and what was the test group?

REPLY 2:

It is not a split mouth study. It is an in vivo, prospective, randomised, clinical study that is performed only on maxillary anterior teeth that include maxillary left and right central incisors, lateral incisors and canines. It is not a comparative study. It is solely performed to know the efficacy of the manual root extractor. Thus, there was no control group.

CHANGES IN THE TEXT:

A prospective, in-vivo, randomized clinical study was conducted to evaluate the efficacy of the manual root extractor. (Page- 4 , Line- 73,74 )

The sampling technique used was Convenience sampling with random allocation. (Page- 4, Line- 79)

#### **COMMENT 3:**

Please provide detail description of “failed to extract”

REPLY 3: In this study, out of 52 maxillary anterior teeth which were to be extracted, 44 extractions were successful and 8 (two central incisors and six canines) were unsuccessful. The reason is elaborated in this revised manuscript.

CHANGES IN THE TEXT:

Due to inadequate engagement of the manual root extractor with the root canal of the central incisors, the forces could not be transferred from the extractor to the root piece thereby leading to a failed extraction. While six canines failed due to splintering of the roots. This occurred due to the presence of an oval root canal in canines, unlike central and lateral canals with conical canals. (Page- 5, Line- 105-109 )

The canal is ovoid labio-palatally in cervical 3<sup>rd</sup> of the root and round in the middle and apical third. Accessory canals are seen more frequently in maxillary lateral incisors than in maxillary central incisors<sup>16, 17</sup>. Thus, no difficulty was faced during the extraction of central and lateral incisors as the conical head of the device fits snugly into the conical canal. (Page- 7, Line- 154-158 )

**COMMENT 4:**

Since this is a product which engage the canal space as purchase for extraction, please compare multiple alternatives with similar concept. Only H file is mentioned yet there are many available instruments with similar mechanism. The surgical techniques, periotome and other mentioned techniques are not in the same category and thus not comparable.

REPLY 4: Instruments other than the H files have been mentioned in this new revised manuscript

**CHANGES IN THE TEXT:**

Studies show use of various instruments for removing broken root pieces by introducing it into the root canal viz. endodontic H-file, K-file, reamers, syringe needle, straight bur and straight probe. (Page- 3, Line- 52-54 )

Other instruments like straight probe, reamer, endodontic K-file, syringe needle and straight bur can be used for retrieving broken root pieces. Straight probe, though longer than H-file can cause difficulty in delivering adequate forces and movement for extraction. Since, the working tip it has an angle of 90 degrees to the shank, the straight probe tends to lose its bend on movement. While files, reamers and burs are thinner as compared to the manual root extractor thereby causing difficulty in engaging the instrument into the canal. Also, the length of the working tip is shorter than the extractor thus there are high chances of slippage of the instrument due to inadequate anchorage. Nevertheless, short handle of files, reamers and bur leads to inadequate delivery of the forces to the root pieces. (Page- 6 , Line- 132-140 )

Unlike straight probe, the manual root extractor allows uninterrupted and free movement of the extractor. (Page- 7 , Line- 134-144 )

**REVIEWER 2:****COMMENT 5:**

It is a good idea to introduce newer techniques for anterior extraction. Please add some evidential proof of the ability to preserve bone compare to conventional methods.

**REPLY 5:**

Preservation of the soft tissue is noted as minimal reflection is needed. Also, no splintering or fracture of the cortices were noted clinically. This study was based on clinical evaluation only. Radiographs were taken pre-operative to check for any dilaceration or pathology. As radiographs (IOPA / RVG) cannot adequately determine the preservation of cortices, they were not included in our study. For thorough examination of the preservation of the bone a CONE BEAM COMPUTED TOMOGRAPHY (CBCT) was needed. Patients were not advised CBCT due to monetary issues.

**CHANGES IN THE TEXT:**

This device is not designed to perforate the bone. Hence its action is limited to the root itself. Thus, even when splintered or fractured, it causes no trauma to the cortices or interdental bone. (Page- 8 , Line- 171-172)

**REVIEWER 3:**

**COMMENT 6:**

What is the novel point of this manual root extractor? This point is critical, and the authors should be described it compared with other root extractors.

**REPLY 6:**

Necessary information about the novelty of this device has been stated in the new revised manuscript. Also, its supremacy over other devices is stated. However, no comparative studies done so far with the manual root extractor.

**CHANGES IN THE TEXT:**

Other instruments like a straight probe, reamer, endodontic K file, needle and straight bur can be used for retrieving broken root pieces. Straight probe, though longer than H-file can cause difficulty in delivering adequate forces and movement for extraction. Since, the working tip it has an angle of 90 degree to the shank, the straight probe tends to lose its bend on movement. While files, reamers and burs are thinner as compared to the manual root extractor thereby causing difficulty in engaging the instrument into the canal. Also, the length of the working tip is shorter than the extractor thus there are high chances of slippage of the instrument due to inadequate anchorage. Nevertheless, short handle of files, reamers and bur leads to inadequate delivery of the forces to the root pieces. (Page- 6 , Line- 132-148 )

Unlike straight probes, the manual root extractor allows uninterrupted and free movement of the extractor. (Page- 7 , Line- 143-144 )

It is made of stainless steel, thus serving good strength and is autoclavable. It does not require any extra armamentarium and is cost effective. However, even if the working end breaks due to manufacturing defect or instrument fatigue, it breaks into the canal itself. Hence, there is no damage to the surrounding soft tissues and retrieval of the broken piece is easy as it is done along with the root itself. (Page- 8 , Line- 177-181 )

**COMMENT 7:**

No control procedure was compared with the Author's manual root extractor procedure.

**REPLY 7:**

The study was not formulated for comparison with a control group. It was solely done to know the efficacy of the manual root extractor.

**CHANGES IN THE TEXT:**

Further studies are required to compare its efficacy with other atraumatic extraction techniques and in root canal treated teeth. (Page- 9 , Line- 195-196 )

**COMMENT 8:**

Didn't the authors' extractor show any bone damage to the adjacent alveolar bone?

**REPLY 8:** The device is designed such that it cannot perforate the bone. It can penetrate only through a hollow space like a root canal. Calcified canals also do not allow its penetration.

**CHANGES IN THE TEXT:**

The tip is strong enough for penetration into the canal but penetration into the cortices or alveolar bone was not possible. (Page- 6 , Line- 123-125 )

This device is not designed to perforate the bone. Hence its action is limited to the root itself. Thus, even when splintered or fractured, it causes no trauma to the cortices or interdental bone. It is a very operator-friendly device as it is light in weight and easy to use. It provides a good tactile sensation. Unlike elevators, it does not take support from adjacent interdental bone. Hence, it does not damage or luxate adjacent teeth or roots. Also, it is less time-consuming as compared to other atraumatic extraction techniques.(Page- 8 , Line- 171-176)

**COMMENT 9:**

In Lines 135-136, "Soft tissue attachments were separated from the neck of the tooth with the help of Moon's probe." This procedure step is essential to achieve successful root extraction. Inadequate soft tissue separation makes root extraction difficult. How do the authors standardize this procedure?

REPLY 9: Necessary changes made in the new revised manuscript.

**CHANGES IN THE TEXT:**

The gingiva around the neck of the root pieces to be extracted was reflected with the help of Moon's probe. (Page- 4 , Line- 88-89 )

Need of minimal soft tissue reflection in this technique helps in preservation of the surrounding soft tissue (Figure 3). Deeper reflection of the gingiva, application of forceps over the buccal and palatal cortices and slippage of the beaks of the forceps can cause inadvertent trauma to the surrounding soft tissue and can also cause alveolar bone damage or fracture. (Page- 8 , Line- 162-165)

**COMMENT 10:**

Line 180: there was no Figure 2c in this manuscript. Also, there was no indication of Figure 2" a" and "b" in the figure and figure caption.

REPLY 10: Necessary changes made.

**CHANGES IN THE TEXT:**

The canal orifice was located, manual root extractor was introduced into the canal and slowly turned in a clockwise manner till the operator felt some resistance (Figure 1). (Page- 4 , Line- 89-91)

It has a narrow long shank that is parallel to the handle. The working tip of the extractor is conical and pointed for its penetration into the root canal (Figure 2a). (Page- 6 , Line- 122-123)

There are two variations in the tip viz., one tip is long and broad with a smaller number of flutes placed 1mm apart (Figure 2b) while the other type has shorter length of tip with a greater number of flutes placed 0.5mm apart (Figure 2c). (Page- 7 , Line- 147-149)

The need of minimal soft tissue reflection in this technique helps in the preservation of the surrounding soft tissue (Figure 3). (Page- 8, Line- 162-163 )

**COMMENT 11:**

Authors described that "it (this device) causes no trauma to the cortices or interdental bone. (Figure 3). And Figure 3 caption showed "Atraumatic extraction with preservation of the cortices". I could not observe "preservation of the bone cortices" from this intraoral photo.

**REPLY 11:**

Apologies for the overstated sentence. Necessary changes made in the new revised manuscript.

**CHANGES IN THE TEXT:**

Need of minimal soft tissue reflection in this technique helps in preservation of the surrounding soft tissue (Figure 3). Deeper reflection of the gingiva, application of forceps over the buccal and palatal cortices and slippage of the beaks of the forceps can cause inadvertent trauma to the surrounding soft tissue and can also cause alveolar bone damage or fracture. (Page- 8, Line- 162-165)