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Non-Root Canal Treated Teeth with Chronic Fatigue Root Fracture: Incidence and Contributing Factors: A Study of Cross-Sections

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Abstract

The goal of root canal therapy is to get rid of the bacteria that are growing in a tooth's root canals. An instrument is inserted into the root canals in many conventional methods of root canal irrigation. However, the treatment carries clinical risks, such as instrument fracture and irrigation liquid extrusion through the apex of the canal, and bacteria removal is frequently incomplete in the apical region of the root canal. We propose a novel high-intensity ultrasound irrigation system that is remotely generated, has improved irrigation performance, and reduces clinical risk. A transducer positioned outside of the target tooth generates the powerful ultrasonic waves used in our device. In order for the generated ultrasonic waves to enter the root canals, they are directed. Acoustic cavitation and vapor bubble formation occur in the targe: system can completely remove bio f lm from the root canal models' apical regions. While using the proposed system, we also measured pressure at the apex of an extracted tooth's root canals. The fact that our system had a lower pressure than the syringe irrigation method suggests that the risk of the irrigation liquid extruding from the apex is lower. The proposed system can clean multiple root canals in a tooth simultaneously with a single treatment because it does not require instruments to be inserted into the canal. In terms of irrigation performance, clinical safety, and ease of treatment, the proposed device would represent a breakthrough in root canal treatment.

K **:** Morphology of the coronal root canal; First maxillary molar; Anatomy of a root canal; Recon guration in three dimensions

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One of the most undesirable conditions in a dental practice is root fracture (RF), which typically results in tooth loss [1]. A longitudinal tooth fracture known as a vertical root fracture (VRF) can be either a complete or incomplete fracture that originates from the root at any level. e fracture line runs parallel to the root canal and connects the root's external surface to the wall of the canal. With or without post-placement, root canal-treated (RCT) teeth are more likely to develop VRF. Between 4% and 13% of extracted RCT teeth contain VRFs. VRF is caused by a number of multifactorial predisposing factors, including occlusal forces and stresses, excessive root canal preparation, instrumentation- or obturation-induced dentinal defects, post-space preparation and cementation, and root anatomy [2]. e maxillary central incisor is the tooth most frequently a ected by horizontal root fracture (HRF), which occurs in the middle third of the root and is more frequently associated with traumatic injuries (0.5–7% of injuries). e HRF's fracture line can cross the root's long axis either perpendicularly or obliquely. In the literature, HRF in posterior teeth that have not been impacted has rarely been reported. Seventy-nine percent of the posterior teeth with HRFs in a Taiwanese population were non-root canal treated and had no previous history of accidental trauma.

e term "fatigue root fracture" was rst used to describe a non-endodontically treated tooth with a root fracture that was caused by a lot of heavy, repetitive, and excessive masticatory stress. Depending on the orientation of the fracture line, chronic fatigue root fracture can be further divided into four categories: vertical, horizontal, oblique, and laminar [3]. Asians and Caucasians have reported this phenomenon more frequently than Caucasians. VRF was found in the mesial root of two mandibular rst molars that were not treated with endodontics and in the mesiobuccal root of one maxillary rst molar. ey proposed that harmful chewing habits and special diets, such as chewing on meat cartilage, crab shells, ice cubes, sugar canes, etc., were factors that predispose to fatigue VRFs.

How common are non-RCT teeth with chronic fatigue root fracture in the Taiwanese population? ere hasn't been a study on it, and there hasn't been a comparison of the clinical factors of fatigue HRFs and VRFs in teeth that haven't had endodontic treatment [4]. Hence, the motivation behind this study was to examine the frequency and clinical qualities of persistent weakness root break in teeth separated at a short term oral and maxillofacial medical procedure facility in a medical clinic in Taipei during a one-year perception period.

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is study was carried out at the Taipei Veterans General Hospital.

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e following were the exclusion criteria: 1) Foreigners, regardless of whether they have national health insurance; 2) Supernumerary or deciduous teeth; 3) Cases with inadequate clinical or radiographic documentation; 4) Individuals under the age of twenty-one; 5) Extracted teeth that have extensive caries and may be at risk of tooth fracture during extraction.

e purposes behind tooth extraction were characterized into ve classi cations, in particular non-restorable carious teeth, periodontal illness, tooth break, impaction and pericoronitis, and others (for example pre-prosthetic or orthodontic reasons, or because of injury) - a characterization changed e classi cation of tooth break was sub-delegated crown-beginning crack and root break. A split, cracked, and fractured cusp were among the crown-originating fractures [6]. VRF and HRF were the root fractures. A fracture line that runs either perpendicularly or obliquely across the root's long axis was referred to as an HRF. Root canal-treated teeth were identi ed by the radiograph as having radiopaque llings in the canals. Non-RCT teeth were those that were prepared for root canal treatment but had no access cavity. e presence of a distinct fracture line along the root canals, presenting radiographically as apical root canal space widening or displacement of fractured root fragments, was typically used to diagnose VRF in non-RCT teeth. e tooth with its remaining so tissue was stored in a thymol solution and included in this study if it was a non-RCT tooth with radiographic features of VRF or HRF and no history of accidental trauma. Using a microscope (OPMI Pico), an endodontist con rmed the location and extension of the fracture line, as well as the diagnosis of VRF or HRF. Zeiss, Oberkochen, Germany), which was stained with methylene blue.

Non-RCT teeth with VRF and HRF were considered to have "chronic fatigue root fracture [7]. In all extracted teeth, the prevalence of chronic fatigue root fractures, including fatigue VRFs and HRFs in non-RCT teeth, was determined.

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e age, gender, type of tooth fracture, tooth position, fractured root morphology in cross-section (slight round or long oval in cross-section), with or without restoration, attrition (severe or not severe), a terminal tooth (yes or no), and missing 1 (at least one) adjacent tooth (yes or no) were all recorded in the clinical data of the non-RCT teeth in this study. As to root morphology, the mesial or distal root or the C-molded foundation of a mandibular molar, the mesiobuccal root or an intertwined buccal (mesiobuccal or distobuccal) and palatal foundations of a maxillary molar, the underlying foundations of a maxillary premolar, and the base of a mandibular incisor were named roots with a long oval cross-segment [8]. e remaining roots were all classi ed as having a slight round cross-section. Two endodontists independently evaluated the severity of attrition based on the clinical photograph and radiograph of the tooth. According to Smith & Knight, attrition indexes of 0 (no loss of enamel surface characteristics, no change in contour), 2 (loss of enamel characteristics, minimal loss of contour), and 3 (loss of enamel exposing dentine for more than 1/3) were considered to be moderate, while attrition indexes of 4 (complete loss of enamel, or pulp exposure) were considered to be severe. In order to reach a nal agreement, any di erences in how the attrition index was assigned to the two readers were discussed.

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Two endodontists independently interpreted the radiographic ndings of the chronic fatigue root fracture in non-RCT teeth and the bony destruction patterns surrounding them [9]. A distinct fracture line or the presence of a displaced root fragment were recorded as evidence of the root condition. e radiographic widening of the root canal space typically served as an illustration or characterization of the vertical fracture line in fatigue VRF. Each periradicular area's radiographic appearance was broken down into seven categories.

e chi-square test or the Fisher exact test, as appropriate, was used to conduct statistical analysis on the clinical factors that were compared between HRF and VRF teeth [10]. e signi cance level was deemed to be below 0.05.

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All extracted teeth in a teaching hospital in Taiwan were found to have non-RCT teeth with chronic fatigue root fractures, according to this cross-sectional study (32/4207). Due to the di culty in making an accurate diagnosis of chronic fatigue root fracture at an early stage, the actual prevalence of this condition in the Asian population as a whole may be underestimated. e failure to identify chronic fatigue root fracture early is caused by the following factors: First and foremost, the majority of these teeth may be mistaken for periodontal disease, hypersensitivity due to severe attrition, or cracked tooth syndrome. is is because, in addition to the fact that the crowns of these teeth with chronic fatigue root fracture have little or no restoration, these patients may also initially exhibit non-speci c symptoms of thermal sensitivity or discomfort when biting. Second, because the radiograph must be taken at the correct angulation of the X-ray beam, with the X-ray passing the fracture line within a range of 15°-20° from the buccal to the lingual surface, diagnosing chronic fatigue root fracture in its early stages is di cult [11]. e dental specialist, thusly, should be know about and experienced in persistent exhaustion root crack when deciphering the radiographs, and all the clinical data, as well as the radiographic discoveries of the patient, should be dissected and assessed all in all. Cone-beam computerized tomography (CT) images with a voxel size of 0.125 mm have been shown to have signi cantly higher sensitivities in detecting simulated HRF than intraoral radiographs. As a result, chronic fatigue root fracture is most commonly diagnosed in the late stage, when the fracture line was more distinguishable and the symptoms were more obvious [12]. e absence of cone-beam CT images for the detection of chronic fatigue root fracture is one of the limitations of this clinical study.

In this study, 4207 extracted permanent teeth were looked at. 263 (6.25%) of the 4207 teeth were extracted due to tooth fracture, and their clinical information was gathered. e types of tooth fractures as well as the numbers of the fractured teeth in teeth with root fractures and crown-originating fractures are listed [13]. 125 (47.53 percent) of the 263 extracted teeth had root fractures, while 138 (52.47 percent) had crown-originating fractures. e root fracture mostly a ected RCT teeth, while the crown-originating fracture mostly a ected non-RCT teeth. VRF and HRF were present in 16 of the 32 non-RCT teeth with chronic fatigue root fracture. e rate of constant weariness root crack in undeniably separated teeth was 0.76% (32/4207) during this one-year perception period.

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In conclusion, 0.76 percent of extracted teeth in this one-year study were found to have chronic fatigue root fracture, making this the rst study to report this phenomenon in non-RCT teeth. ere was a

distinct fracture line or displacement of the fractured root fragment in all extracted teeth with chronic fatigue root fracture. Normal, halo, or vertical bone loss patterns were the patterns of bone destruction. e frequency of the fatigue VRF and fatigue HRF was similar, and they mostly a ected older men, teeth with a lot of decay, and posterior teeth that had little or no restoration. In comparison to the fatigue HRF, the fatigue VRF was more prevalent in molars, teeth with long oval roots, and terminal teeth. For a better understanding of the nature of chronic fatigue root fracture, additional clinical and fundamental research should be carried out because prevention is superior to treatment.

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None

References

1. Plog J, Wu J, Dias YJ, Mashayek F, Cooper LF, et al. (2020) Reopening dentistry after COVID-19: complete suppression of aerosolization in dental procedures by viscoelastic Medusa Gorgo. Phys Fluids (1994) 32: 083111.
2. Marui VC, Souto MLS, Rovai ES, Romito GA, Chambrone L, et al. (2019)