

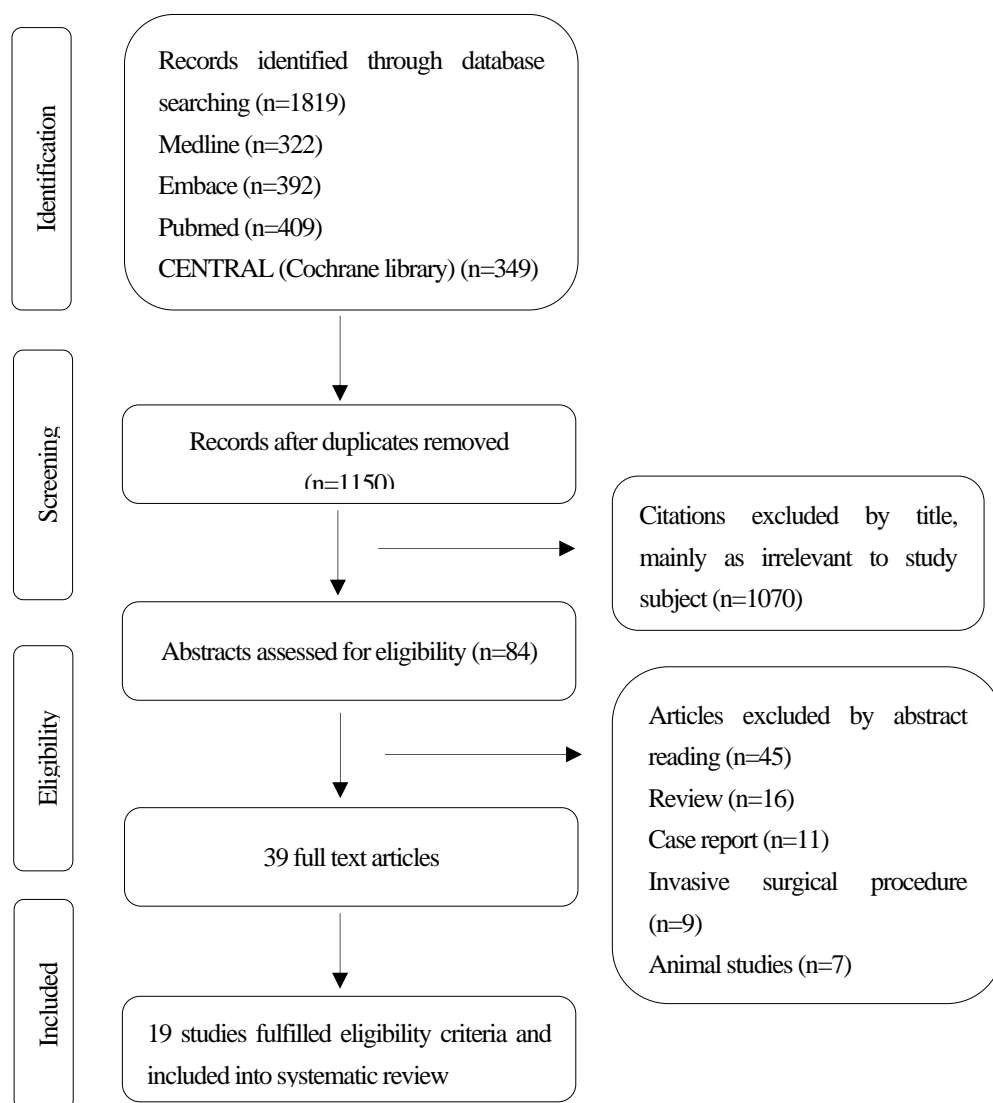
Effectiveness and Safety of Minimally Invasive Orthodontic Tooth Movement Acceleration: A Systematic Review and Meta-analysis

T. Fu, S. Liu, H. Zhao, M. Cao, and R. Zhang

Appendix

Appendix Table 1 Search strategy

	PubMed	CENTRAL, Medline, EMBASE, pro-Quest
#1	Piezosurgery [Mesh] OR piezoelectric OR piezocision OR piezo*	Piezosurgery OR piezoelectric OR piezocision OR piezo*
#2	Micro-osteoperforation or discision or laser-assisted flapless corticotomy	Micro-osteoperforation or discision or laser-assisted flapless corticotomy
#3	minimally invasive	minimally invasive
#4	Orthodontics [Mesh] OR orthodont*	Orthodontics OR orthodont*
#5	(#1 or #2 or #3 or #4) and #5	(#1 or #2 or #3 or #4) and #5



Appendix Fig. 1 PRISMA flow diagram of the included studies

brackets. After local anesthesia, starting from tooth number 6 in both sides of the maxillary and mandibular arch, guiding incisions are performed using a scalpel in both jaws to the sites corresponding to the interdental regions under the interdental papillae by also considering the dental roots. Incisions with a depth of approximately 3 mm are subsequently performed on these marked regions with the aid of a disc saw (Osstem Implant, Esset KIT-Saw, Seoul, Korea). No sutures are placed to the incision areas. After the operation, the patient is advised to brush their teeth at least twice daily and use mouthwash with chlorhexidine-containing solutions for one week.

Laser Assisted Flapless Corticotomy (Salman and Ali 2014)

Each patient is instructed to use chlorhexidine mouth wash before the surgical intervention and anesthetic administration. The use of an infiltration anesthetic is recommended for pain-sensitive patients. Less sensitive patients can be given a surface anesthetic using a small cotton pellet soaked with anesthetic solution on the determined site for surgery for ½ minute to avoid ulceration of the oral mucosa. If no anesthetic is administered, the patient should be informed that he/she might experience a sensation of warmth in the mucous area that the sensation will disappear after treatment has ended.

Each patient requires a Periapical X-ray for the side of the operation to determine the accurate position of the holes between the roots. In this situation, a temporary arch wire is employed (0.018 inch S.S) with two U-loops (indicator loops), including one loop between the maxillary lateral incisor and maxillary canine and the other loop between the maxillary canine and the 2nd premolar.

A series of circular holes (4 holes) are made along the planned position. These holes are 2-3 mm apart, and their spacing is determined according to the depth of the buccal vestibule (as we did not reflect a surgical flap).

Each hole was approximately 1.5 mm in diameter. The depth of the laser cutting was measured and continuously controlled during the operation using a UNC 15 periodontal probe with a stopper read approximately 3 mm deep in addition to several reads that are partial millimeters deep into the medullary bone to enhance bleeding.

The entire surgical procedure is performed in two major steps with two different parameters:

- A- Soft tissue incision by a KAVO laser device using a special hand piece with a fiber-optic delivery system.
- B- Hard tissue cutting by an Er:YAG laser using parameters for bone ablation and another type of hand piece in non-contact mode with constant water spray irrigation .

Interseptal bone reduction (Leethanakul et al. 2014):

Traditional extraction of the first premolar is performed on one side as a control, while extraction combined with interseptal bone reduction is performed on the experimental side. The surgical procedure is performed inside the extraction socket of the maxillary first premolar without flap surgery under local anesthesia. The extraction socket was deepened to the length of the canine apex, and the interseptal bone distal to the canine is reduced to 1 to 1.5 mm in thickness using round and cylindrical carbide burs. If present, the interradicular septal bone of the socket is also removed. The first premolar extraction socket is surgically widened in the buccopalatal

dimension along the curvature of the root of the canine. The bur is held parallel to the surgical guide wire and advanced buccopalatally, while the alveolar crest of the interseptal bone is left untreated. A periapical radiograph is obtained prior to and after the surgical procedure.

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