Removal of silver points and fractured posts by ultrasonics

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Diverse additional advantages can be often found in established procedures. For example, the ultrasonic unit was designed to be used as a definitive periodontal technique for vibrating and loosening calculus. The mechanism was modified by Martin et al.[1] for the preparation and cleansing of a root canal. The Endosonic (Dentsply International, Inc., York, Pa.) procedure is a classic example of tangential use of an established dental technique.

During its evaluation as an endodontic instrument, an additional application of the instrument in post removal was noted. Although the procedure has been published previously, the practitioner has not had adequate exposure to the technique.[2-5] This article presents the use of ultrasonics for removal of well-cemented silver points and posts that were intact or fractured.

PROBLEM

Dentists are often confronted with removing cemented silver points and posts within the root canal. It may become necessary to re-treat a tooth or to replace a post in a tooth included in a fixed prosthesis. Removal can be arduous when the point or post firmly fits the canal and has been well cemented.

This difficulty is compounded when the post is severed at or below the floor of the pulp chamber or well within the canal. The post cannot be grasped by pliers or an endodontic instrument inserted along it sides to remove it. A variety of techniques and devices have been introduced to solve this problem.

SOLUTION

It is necessary to disturb the integrity of the cementing media, but unfortunately there has been limited success in dissolving cement.

The use of ultrasonics has been suggested to interrupt the integrity of the cement by vibration to facilitate post removal (Fig. 1).

PRINCIPLES AND TECHNIQUE

1. The vibrations must be transferred to the point or post to be removed.
2. The coronal surface of the post must be totally

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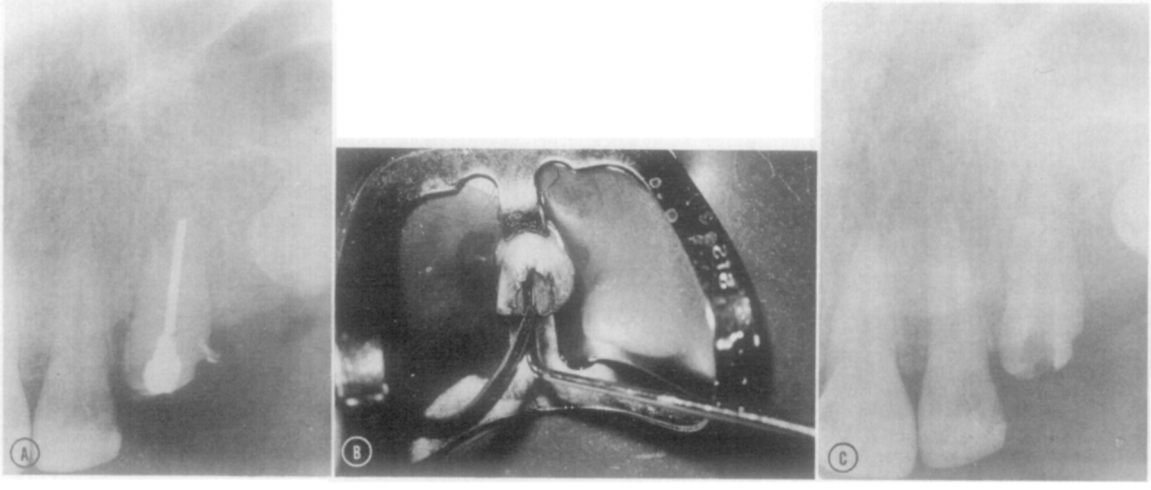

Fig. 1. Removal of firmly fitted silver point to enable placement of gutta-percha prior to post preparation. **A,** Preoperative radiograph. **B,** Explorer placed parallel to silver point with ultrasonic probe in contact. **C,** Silver point removed.

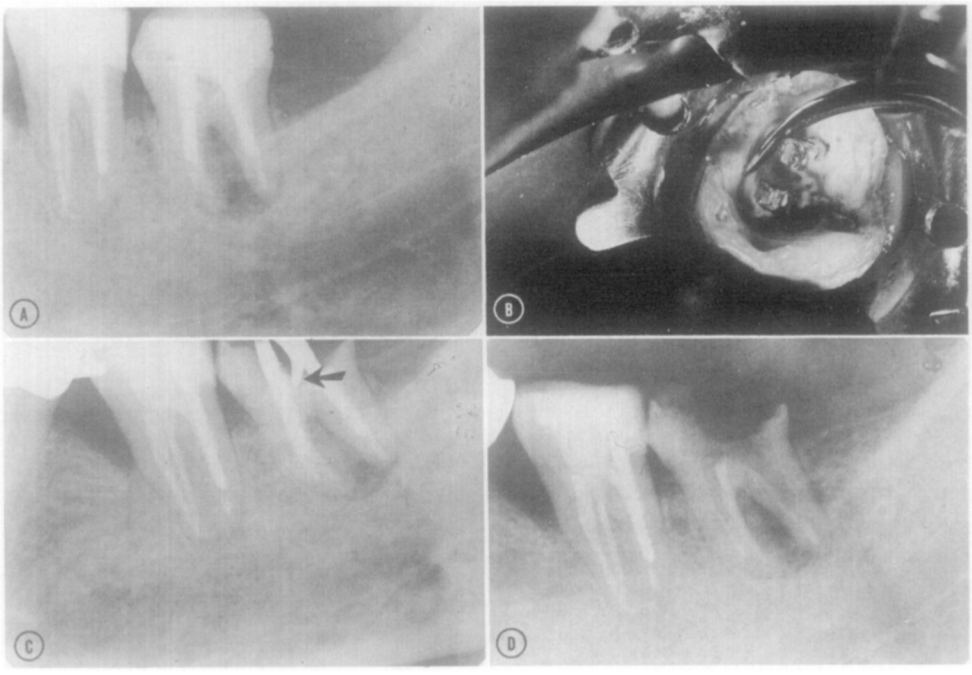

Fig. 2. Removal of prefabricated threaded post cemented with composite resin. **A,** Preoperative radiograph. It was necessary to remove posts and composite resin to retreat tooth. **B,** Removal of overlying filling material exposes posts and allows ultrasonic tip to be activated while in contact with post. **C,** Radiograph shows tip in contact with post *(arrow).* **D,** Radiograph verifies successful removal of posts.

exposed by removing overlying filling material, that is, alloy, cement, or composite resin (Fig. 2).

3. When a space is created at or below the floor of the pulp chamber, next to the coronal portion to increase contact with the vibrating tip, this space is prepared with a slow-speed rotary instrument (Fig. 3) or by working a small file between the post and the canal wall for a few millimeters and progressively enlarging the space.

4. If the canal space is too confined to insert the probe tip, a large file or explorer is placed in contact with the cemented object and the probe contacts it to transfer the vibratory effect (Figs. 4 and 5).

Adequate space to permit vibration is recommended around the probe or contacting instrument. Vibration can be aborted or limited if the probe is too tight within the canal, which could negate the intended effect.

5. In removing silver points, the canal is flooded with a sealer solvent (chloroform) before the ultrasonic vibration is activated. "The ultrasonic energy sets up shock waves in the chloroform solution and makes it penetrate deeper into the canal space exerting a faster solvent effect on the cement sealer."[4]

6. There is no prescribed time for this removal procedure. Some objects loosen within a short time while others are more resistant.

7. The dislodged object can be removed with appropriate forceps or a file-braiding technique (Fig. 6).

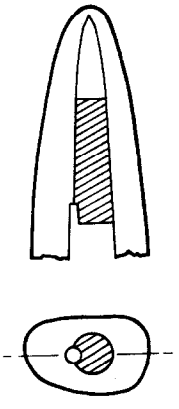

Fig. 3. When post is at or below floor of pulp chamber, create space next to coronal portion to increase contact with vibrating tip.

COMPLICATIONS

Prolonged ultrasonic vibration generates heat. Therefore, if a local anesthesia is used, a water spray is necessary to prevent heat damage to the surrounding periodontium.

Additional questions have surfaced regarding the incidence of cracks or craze lines within the tooth by the ultrasonic vibration. Further research is necessary and encouraged to respond to the questions.

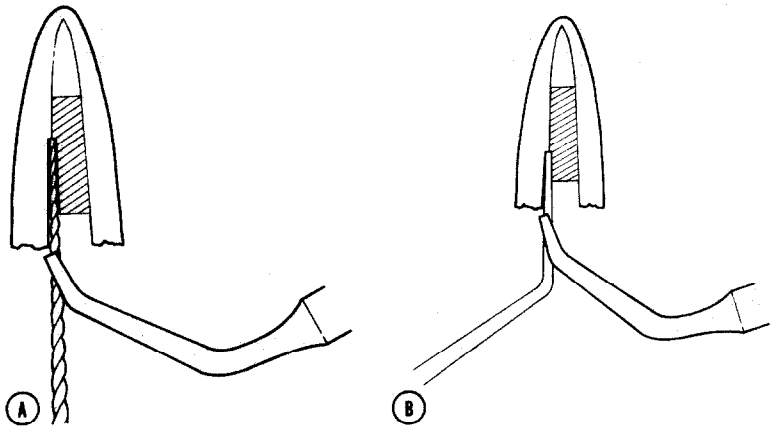

Fig. 4. If canal space is too restricted for probe tip, **A,** place a large file or, **B,** an explorer in contact with post to transfer vibratory effect from file or explorer to post.

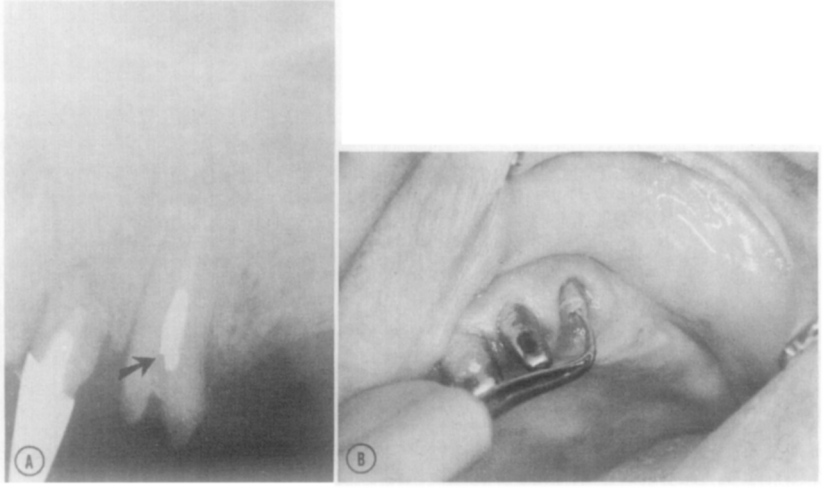

Fig. 5. A, Cast post fragmented within canal and notched *(arrow)* for better contact with ultrasonic probe. **B,** Probe parallel to post.

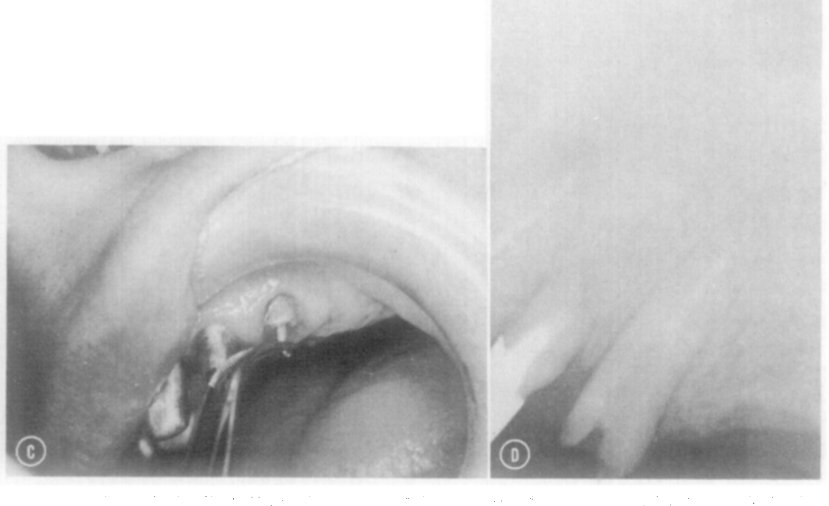

Fig. 5. C, Dislodged post removed with pliers. **D,** Radiograph shows that post is removed.

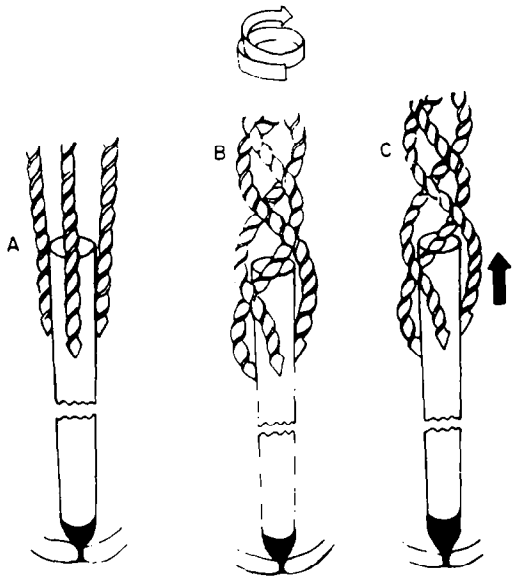

Fig. 6. Braiding method for removing silver points. **A,** Two or three files are placed parallel to silver point. **B,** Intertwining files form grip on silver point. **C,** Gradual pull often dislodges point. Repeated attempts may be necessary to loosen point.

SUMMARY

The ultrasonic principle can be used for the removal of intact or fractured cemented silver points and posts. The rationale of removal and a specific technique was presented.

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Comparison of five interocclusal recording materials

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Interocclusal recording materials are generally used in prosthetic dentistry to register jaw relationships for mounting dental casts on an articulator. These materials have a wide range of physical properties including viscosity, elasticity, and volumetric changes within the various material groups.[1-12]

This study compared the clinically important properties of five common types of recording materials to find the most suitable material. The properties studied were resistance to closure, thermal expansion, setting, and storage under various conditions.

MATERIAL AND METHODS

The materials used included silicone putty (Optosil Plus, Bayer Dental, Leverkusen, West Germany), polyether elastomer (Ramitec, Espe Premier, Norristown, N.J.), zinc oxide and eugenol paste (Kerr Paste, Sybron/Kerr, Romulus, Mich.), eugenol-free zinc oxide paste (Nogenol, Coe Laboratories, Inc., Chicago, Ill.), acrylic resin (Paladur, Kulzer AG, Bad Homberg, West Germany), and baseplate wax (Astynax, Kemdent, Associated Dental Products Ltd., Purtow, England).

Resistance to closure was evaluated by a method comparable with the clinical event by means of stone casts of average size, mounted on an articulator (A.B. Dentatus, Hagersten, Sweden). The upper arch of the articulator was loaded with a weight slightly outweighing the resistance of the recording material between the teeth. The upper teeth sank until in contact with the lower ones. The pressure force between the teeth was then measured with the bitefork of a device designed for measurement of bite force (Bitex, Technical Research Centre of Finland, Helsinki, Finland, Appliance no. 802) (Fig. 1). This apparatus has been described previously by Helle et al.[13] The closing force was recorded by a writer (Recorder, Servogor S, Goerz Electro ges N.B.H., Vienna, Austria, calibration 0.5 to 50.0 N). It

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