

# ATRAUMATIC EXTRACTIONS OF FRACTURED ROOTS UTILIZING PIEZOELECTRIC TECHNOLOGY

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The removal of fractured roots is often associated with complications in clinical practice. In some cases, root extraction may jeopardize the integrity of the bony housing –especially the fragile buccal bone plate- during root elevation. In other cases, the presence of extensive decay on the root may require flap reflection in order to perform root extraction. Especially when immediate implant placement in the extraction socket is intended, a skilled root extraction should be performed. In these challenging clinical cases, the application of piezoelectric technology presents major advantages.

## Case 1 – Root removal and immediate implant placement.



Fig 01: 33 yr old patient.

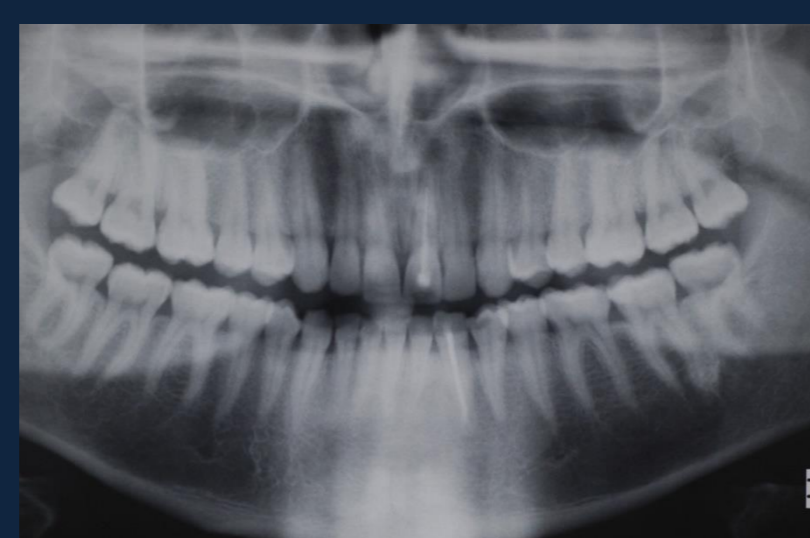


Fig 02: #21 has to be extracted.



Fig 03: Horizontal root fracture.

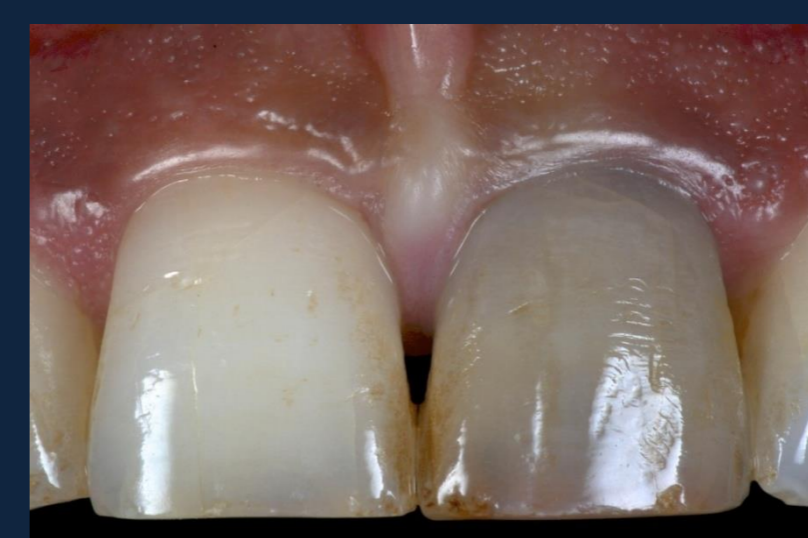


Fig 04: Ideal surrounding tissues.



Fig 05: Incision of the crestal fibres.



Fig 06: Gentle luxation of coronal part.



Fig 07: Removal of the coronal part.



Fig 08: Placement of straight tip.



Fig 09: Atraumatic bone removal.



Fig 10: Gentle luxation of the apical part.

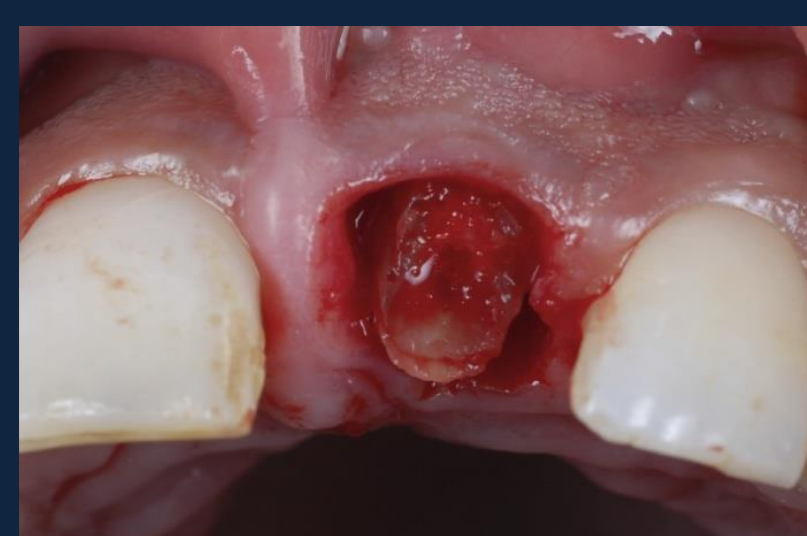


Fig 11: Luxated apical part.



Fig 12: Sounding of the bony housing.



Fig 13: Implant placement.

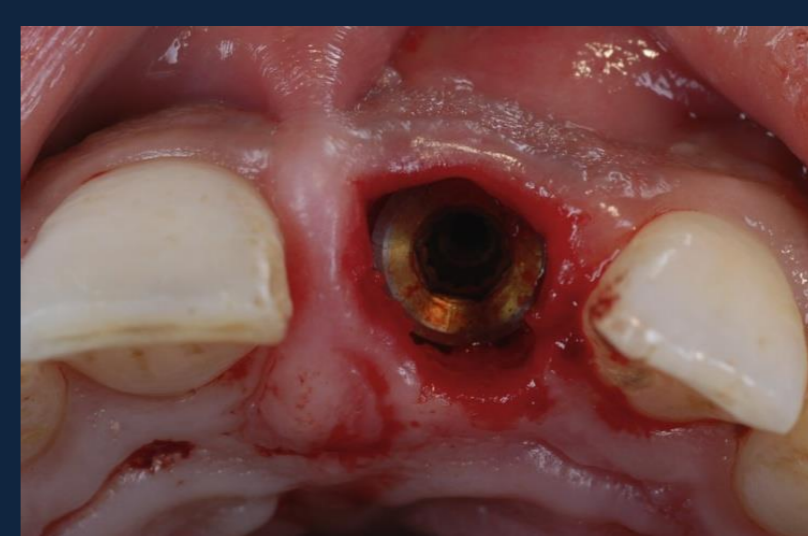


Fig 14: Implant in situ.



Fig 15: Provisional restoration.

## Case 2 – Atraumatic removal of root with complicated anatomy.



Fig 16: Fractured root #25.



Fig 17: Failed endodontic treatment.



Fig 18: Application of straight tip.



Fig 19: Root fragments.

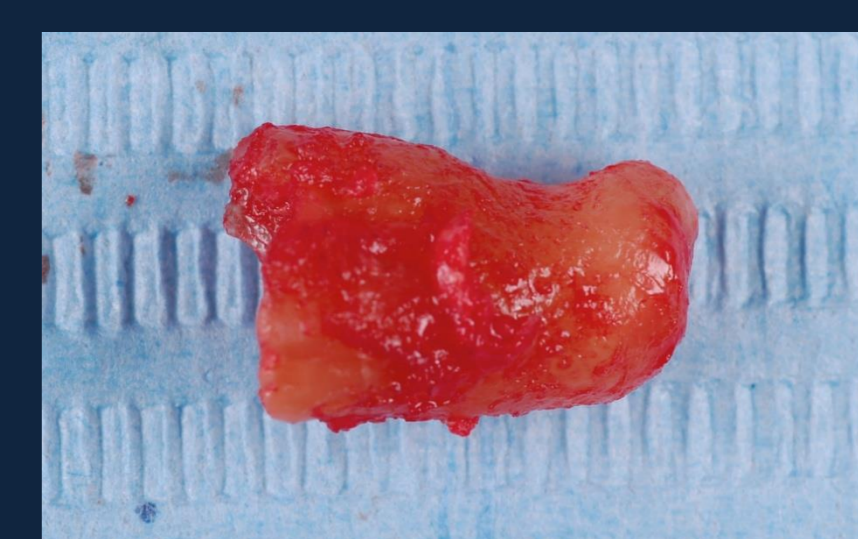


Fig 20: Challenging root morphology.



Fig 21: Different tip designs.

## CONCLUSIONS

Piezoelectric technology has been extensively applied in orthopaedic surgery and neurosurgery. Nevertheless, only recently have piezoelectric devices, designed for oral and maxillofacial surgery, appeared in the market. Piezoelectric devices work with ultrasound vibrations and inflict micrometric cuts only on mineralized tissues (i.e. bone), leaving the surrounding soft tissues unaffected. Their cutting action includes bone perforation, micrometric osteotomy or osteoplasty, horizontal osteotomy, micro-debridement, micro-root preparation and membrane separation [i.e the Sneiderian membrane covering the sinuses] from bony walls.

They are a promising tool for osteotomy and osteoplasty in oral surgery, implantology, periodontology and surgical endodontics. They offer surgical precision, intra-operative sensitivity and a blood-free surgical site which guarantees maximum intra-operative visibility. Piezoelectric technology is simple to apply and increases significantly the dental treatment quality provided to our patients.