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Intentional replantation

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In 1982, Grossman defined intentional replantation as being 'a purposeful removal of a tooth and its reinsertion into the socket almost immediately after sealing the apical foramina'.

In addition, Grossman (1982) stated that it is: 'The act of deliberately removing a tooth and, following examination, diagnosis, endodontic manipulation and repair – returning the tooth to its original socket to correct an apparent clinical or radiographic endodontic failure'.

Intentional replantation should only be used as a last resort therapy after all other endodontic procedures (primary and secondary root canal treatment) have failed and where apical surgery is not feasible due to poor access, or the proximity of the apical area to nerves or other anatomical structures.

Contraindications of this treatment include cases where extraction could result in fracturing the roots or the coronal part of the tooth.

Research has reported a success rate for the procedure of 83% in cases where no orthodontic extrusion was performed prior to intentional replantation.

This figure jumps up to 94% in cases where both procedures were performed (Choi et al, 2014).

Benefits of intentional replantation

- Less invasive than apical surgery
- Procedure of relatively low difficulty with a high success rate
- Inexpensive, quick procedure in comparison with apical surgery.

Case study

Intentional replantation of a lower left second molar associated with a large periapical cyst-like lesion

A 44-year-old male with no contributing medical history was referred for an endodontic evaluation of the teeth from the mandibular left quadrant.

The patient's chief complaint was a throbbing discomfort located in the lower left molars.

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Figure 1: Preoperative radiograph



Figure 2: One-year review radiograph



Figures 3A and 3B: Buccal sinus tract and a pocket of 10mm associated with LL7 were noted

Upon examination, both first and second lower left molars appeared to be tender to percussion. No sinus tracts or pockets were noted at this stage.

A preoperatory radiograph was taken (Figure 1). This revealed that the LL6 presented with what appeared to be a well-adapted full coverage crown, substandard root canal fillings, apical resorption of the distal root and associated periapical radiolucencies.

In the case of the LL7, a complex configuration of the root canal system – c-shaped anatomy – was noted, as well as a large associated periapical radiolucency.

Coronally, LL7 presented with a large coronal restoration with radiographic signs of secondary decay.

The pulpal diagnosis was that of a previously root treated tooth for LL6 and of pulp necrosis for LL7, while both teeth shared the same periapical diagnosis: symptomatic apical periodontitis.

Treatment plan

A discussion of treatment going forward was initiated with the patient. All options, with advantages and disadvantages, were discussed.

The agreed treatment plan included the restorability assessment of LL7 and, if restorable, root canal therapy for both LL6 and LL7.

In the eventuality that one or both treatments would fail, apical surgery (LL6) or intentional replantation (LL7) were suggested.

All procedures – endodontic, restorative and surgical – were performed exclusively with the aid of a dental operating microscope.

The root canal treatments and the immediate adhesive coronal restorations were performed in two separate sessions, which were uneventful. Arrangements to review the case after one year were made (Figure 2).

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Figure 4: A large periapical cyst-like lesion, situated in close proximity to the mandibular canal, associated with LL7 and encompassing the distal root of LL6 was noted

Eight months after the completion of root canal therapy, the patient returned to the practice due to a recent episode of flare-up associated with the lower left molars.

Upon clinical inspection, a buccal sinus tract and a pocket of 10mm associated with LLZ were noted (Figures 3a and 3b).

CBCT scan analysis showed a previously root treated LL6 and LL7 with root fillings within standards. Also, a large periapical cyst-like lesion, situated in close proximity to the mandibular canal, associated with LL7 and encompassing the distal root of LL6 was noted (Figure 4).

Treatment options included:

- Apicoectomy (very difficult, poor prognosis on account of a very challenging access and extent of the bone defect)
- Intentional replantation of LL7
- Extraction and replacement with a single implant supported crown.

The risks and benefits were explained to the patient. In the end, the patient opted for intentional replantation of LL7.

Treatment procedure

Antisepsis was carried out using 0.2% chlorhexidine gluconate; then, the inferior alveolar nerve block was performed using a cartridge of lidocaine (2% lidocaine with 1/80000) as well as buccal and lingual infiltration anaesthesia.

The LL7 was extracted as atraumatically as possible. During the extraoral period, the periodontal tissue was kept hydrated with the help of a moist gauze (Figures 5a to 5c). Subsequently, 3mm of the root apex were resected, and the root end cavity was prepared and filled with mineral trioxide aggregate (MTA) (Figures 5d to 5f).

Due to the patient having a limited mouth opening, and also the size of the bone defect, complete removal of the granulation tissue was not possible. Blood clots were removed by normal saline rinsing. Immediately after, the tooth was repositioned into its bone socket and a flexible buccal splint was placed (Figures 5g to 5j). The postoperative radiograph showed a correct repositioning of LL7 and a retrofilling within radiographic standards (Figure 5k).

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Figures 5A, 5B and 5C: During the extraoral period, the periodontal tissue was kept hydrated with the help of a moist gauze



Figures 5D, 5E and 5F: 3mm of the root apex were resected, and the root end cavity was prepared and filled with MTA



Figures 5G, 5H, 5I and 5J: The tooth was repositioned into its bone socket and a flexible buccal splint was placed

The splint was removed one week later. Three months after, the buccal sinus tract appeared to be healed and the periodontal probing was within normal limits (Figures 6a and 6b).

One-year review

The tooth was asymptomatic to all clinical tests, with

periodontal probing and mobility within the normal limits.

Radiographic examination showed signs of bone regeneration in the periapical area associated with LLO and LL7. This was further confirmed by means of CBCT scan analysis. At this point, the outcome of the procedure was deemed as favourable and a full coverage crown on the LL7 was advised (Figures 7a to 7d).

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Figure 5K: Postoperative radiograph





Figures 6A and 6B: Three months later. Buccal sinus tract was healed and periodontal probing within normal limits



Figures 7A, 7B, 7C and 7D: The outcome of the procedure was favourable and a full coverage crown on the LL7 was advised

Conclusion

As an endodontic procedure for teeth with persistent endodontic disease where periradicular surgery is not feasible, intentional replantation is a reliable, low complexity manoeuvre that is usually associated with a predictable outcome, given good case selection.

References

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