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ORIGINAL ARTICLE/ARTICOLO ORIGINALE

Apical surgery vs apical surgery with simultaneous orthograde retreatment: A prospective cohort clinical study of teeth affected by persistent periapical lesion

Chirurgia apicale vs Chirurgia apicale con ritrattamento ortogrado simultaneo: studio clinico prospettico di coorte

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KEYWORDS

Apical surgery;
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Abstract

Aim: This prospective clinical study analyzed the 24-month outcome of conventional apical surgery retro-filled with calcium-silicate cement *versus* apical surgery with simultaneous orthograde retreatment by means of clinical and radiographic criteria.

Materials and methods: This study included 83 teeth affected by persistent periapical lesions in 68 patients. Mean age was 52 years (median = 51 years; range 19–81 years). Twenty-eight cases were treated with apical surgery, 16 cases with apical surgery with simultaneous orthograde retreatment and 39 cases with orthograde retreatment in previously treated teeth established as control group. Periapical index score (PAI) was used as radiographic criteria. Teeth were examined at 6 months, 1 and 2 years and classified as *healed* (without any symptoms and

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PAROLE CHIAVE

Chirurgia apicale;
Ritrattamento;
Trattamento;
Endodonzia;
MTA.

PAI ≤ 2), *healing* (without any symptoms and PAI = 3) or *diseased* (with symptoms or PAI ≥ 4 and not functional) on the basis of radiographic and clinical criteria. At 24 months evaluation, *healed* and *healing* were considered as *success* and *diseased* and *fracture* as *failure*. Multilevel GLM model and an ordered logistic regression as statistical analysis was made with level of significance set at $p < 0.05$.

Results: Total drop-out was 7% ($n = 6$). After 6–9 months, 6 teeth (3 from apical surgery, 2 from simultaneous treatment and 1 from orthograde retreatment) were extracted for root fracture. Twenty-four-month *success rate* of apical surgery group was 78% ($n = 17$), apical surgery with simultaneous orthograde retreatment presented 81% ($n = 10$) and orthograde retreatment success was 80% ($n = 24$). There was no statistically difference between the groups at 24 months ($p = 0.890$).

Conclusions: Both surgical techniques revealed a high percentage of healing, similar to that reported by previous studies. Apical surgery with simultaneous orthograde retreatment showed a faster healing after 12 months comparing to the control group.

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Riassunto

Scopo: In questo studio sono stati confrontati pazienti trattati con chirurgia apicale convenzionale vs chirurgia apicale con ritrattamento ortogrado simultaneo. Come gruppo controllo, sono stati considerati pazienti sottoposti a ritrattamento ortogrado.

Materiali e metodi: Questo studio ha incluso 83 elementi con lesioni periapicali persistente (68 pazienti). Ventotto casi di chirurgia apicale, 16 casi di chirurgia apicale con ritrattamento ortogrado simultaneo e 39 casi di ritrattamento ortogrado non chirurgico come gruppo controllo. L'indice periapicale (PAI) è stato utilizzato come criterio radiografico. Gli elementi sono stati esaminati ogni 6 mesi per 24 mesi e classificati in base a criteri clinici e radiografici come *guarito* (assenza di sintomi e PAI ≤ 2), *in guarigione* (assenza di sintomi e PAI = 3) e *non guarito* (presenza di sintomi o PAI ≥ 4). A 24 mesi gli elementi *guariti* e *in guarigione* sono stati classificati come *successo clinico* mentre gli elementi *non guariti* e *fratturati* come *fallimento*. È stata eseguita un'analisi statistica sul modello multilevel GLM e regressione logistica per valutare una possibile differenza significativa tra i gruppi ($p < 0.05$).

Risultati: Il drop-out è stato del 7% ($n = 6$). Sei elementi (3 dal gruppo chirurgia apicale, 2 dal gruppo chirurgia apicale con ritrattamento ortogrado simultaneo e 1 dal gruppo ritrattamento ortogrado non chirurgico) sono stati estratti dopo 6-9 mesi per frattura radicolare e sono stati considerati come fallimento. Nel gruppo di chirurgia apicale si è osservato un successo clinico a 24 mesi del 78% ($n = 17$), nel gruppo chirurgia apicale con ritrattamento ortogrado simultaneo dell' 81% ($n = 10$) e nel gruppo ritrattamento ortogrado non chirurgico dell' 80% ($n = 24$).

Conclusioni: Entrambe le tecniche chirurgiche hanno mostrato un'alta percentuale di successo a 24 mesi. Non ci sono state differenze significative tra i trattamenti ($p = .890$) a 24 mesi. È stato osservato una guarigione più rapida nel gruppo di chirurgia apicale con ritrattamento ortogrado simultaneo.

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Introduction

The aim of orthograde retreatment is the elimination of necrotic tissue, bacteria and infected obturation material such as gutta-percha and cements from root canal and seal of the canals to prevent re-infection and allow healing.¹ Preparing root canals to the apical foramina² or using a patency file³ may clean most of the apical portion of the main canal, but bacteria are still likely to remain in lateral and accessory canals or in apical ramifications⁴ that remain un-instrumented or out of the reach of irrigants. In specific cases when bacteria colonize the apical ramifications of the canal or in presence of extraradicular infection, a surgical procedure

effectively removes the infected site and enhances chances of healing.⁵ However, in the majority of teeth in which bacteria colonize within the entire root canal system, root-end filling might not effectively prevent persistence or recurrence of apical periodontitis after surgical procedure,⁵ hence a simultaneous orthograde therapy with apical surgery would eliminate the infection and prevent reinfection.⁶ As orthograde retreatment is performed simultaneously with apical surgery, coronal and middle portions of the root canal system are also cleaned thoroughly.^{7,8} Therefore, the present study compared results of two different surgical approaches, with and without simultaneous orthograde retreatment. As control group conventional orthograde retreatment was considered.

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