

Spontaneous re-eruption, surgical or orthodontic extrusion: What is the choice for intrusive luxation in permanent teeth?

Abstracted from

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Question: What is the best treatment for permanent teeth with intrusive luxation?

Data sources Medline, Embase, the US Clinical Trials and ISRCTN Registry databases.

Study selection Two reviewers independently selected studies. Interventional and observational studies comparing the outcomes of orthodontic or surgical re-position of intrusive luxation of permanent teeth compared with spontaneous re-eruption were considered.

Data extraction and synthesis Two reviewers abstracted data and assessed study quality using the Cochrane Risk of Bias tool. Periodontal and pulpal outcomes after treatment were compared using risk ratios (RR) with 95% confidence intervals (CI) and meta-analysis conducted.

Results Eight studies involving a total of 440 patients were included. All of the studies were considered to be at high risk of bias. A meta-analysis of four studies comparing surgical re-positioning vs spontaneous re-eruption suggested no significant difference RR = 1.30 (95% CI; 0.90–1.88) P = 0.16. Meta-analyses were also performed for secondary outcomes and other sub-groups.

Conclusions While the review suggests that spontaneous re-eruption should be the treatment of choice the quality of the available evidence is poor.

Commentary

This systematic review represents a trial for quantifying the effect of three treatment strategies of intrusive luxation in permanent teeth. For the sake of quantification, the authors combined results from different study designs and different time points (prospective and retrospective). Although it is advised not to mix apples and oranges in the meta-analysis, this methodology is beginning to emerge more frequently in systematic reviews of surgical interventions. One of the reasons would be the difficulty in finding similar studies with abundant data to be combined statistically. In addition, most included studies are methodologically heterogeneous. When these two factors exist, it would be theoretically impossible to obtain a valid summary effect estimate. Thus, the resultant systematic review will not be efficient in guiding clinicians towards the better treatment option.

The mix of apples and oranges doesn't come without a cost. Inherent biases – like selection and recall bias – lie in retrospective

studies compared to prospective ones. Thus, the difference in effect size of included studies could be due to these biases rather than the actual difference between the intervention and control per se.

The authors included eight studies, none of which were randomised controlled trials. The absence of randomisation is possibly due to the emergency nature of dental trauma and the low incidence of intrusive luxation. Heterogeneity between studies exists both on the methodological as well as on the statistical level. Methodologically, the studies lacked standardisation of treatment protocol. They differed in the antibiotic therapy, post-surgical splinting type, local disinfection and timing of orthodontic intrusion. This variation in the methodological steps has been reflected statistically as most meta-analyses showed moderate to high heterogeneity (I^2).

Regarding quality assessment of included studies, the authors selected the risk of bias tool adopted by Cochrane. This was an eccentric choice owing to the non-randomised nature of dental trauma research. Thus, it was not surprising to see that all included studies showed a high risk of bias. Quality assessment results could have been different if the authors utilised one of the tools for non-randomised studies like RoBANS or MINORS.¹ If we included all studies considered to be of poor quality, then combining them in a meta-analysis will exaggerate the biases.² Hence, the results of this systematic review should be interpreted with extreme caution.

Finally, surgical intervention research should be considered as a specific entity owing to the possible emergency nature, scarcity of cases, need for professional expertise and different applied protocols. Thus, there is a need for specific guidelines for systematic reviews of surgical interventions both on the methodological and the statistical levels. Until these guidelines come to light, we hope to see more refined systematic reviews of surgical interventions.

Ahmed Elkhadem and Ahmed Kotb

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