True molar intrusion attained during orthodontic treatment: a systematic review

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CRD summary
This review assessed the efficacy of orthodontic treatment in attaining true molar intrusion and concluded that there was insufficient evidence to assess the quantity or clinical significance of true molar intrusion achievable during treatment. Despite some flaws in the review methodology and reporting, this conclusion appears reliable as it accurately reflects the fact that the review only included one small non-randomised study.

Authors' objectives
To quantify the amount of true molar intrusion attainable during orthodontic treatment.

Searching
MEDLINE (1966 to April 2005), EMBASE (1988 to April 2005), Web of Science (1945 to 2004), EBM (to March 2005) and LILACS (April 2005) were searched; the search terms were reported. References of retrieved articles were checked, and online resources of three principal orthodontic journals were searched. No language restrictions were employed.

Study selection
Clinical trials were eligible for inclusion in the review. The included study was a retrospective non-randomised controlled study.

Specific interventions included in the review
The inclusion criteria were not specifically stated, but it appeared that studies of any form of orthodontic treatment for intrusion of permanent molars were eligible for inclusion. The included study assessed Interlandi-type high-pull headgear, applying a force of 500 g at the level of the buccal trifurcation of the maxillary first molars. The headgear was worn for 6 months for an average of 12 hours per day.

Participants included in the review
The inclusion criteria were not specifically stated, but it appeared that studies of patients undergoing orthodontic treatment for intrusion of permanent molars were eligible for inclusion. The included study enrolled adolescents who were described as class II division I patients. The participants in the intervention group were aged between 9.5 and 12.5 years.

Outcomes assessed in the review
Studies that reported true molar intrusion and factored out growth when required were eligible for inclusion in the review.

How were decisions on the relevance of primary studies made?
Two reviewers independently assessed study abstracts written in English. Any discrepancies were resolved either through discussion or by obtaining the full paper. One reviewer assessed non-English language abstracts. Three reviewers independently assessed full papers and agreement was reached through consensus. Where further information was required, authors were contacted.

Assessment of study quality
The authors did not state that they assessed validity.
Data extraction
The authors did not state how the data were extracted from the study, or how many reviewers performed the data extraction.

Methods of synthesis
How were the studies combined?
A narrative description of the single included study was provided.

How were differences between studies investigated?
As only a single study was included, no between-study differences were discussed.

Results of the review
One study with 24 patients was included in the review.

The mean maxillary molar intrusion for the 12 patients in the treatment group was 0.96 mm (standard deviation 0.54). No results were reported for the control group.

Authors' conclusions
There is limited evidence about the quantity of attainable molar intrusion. The clinical significance of the level of true intrusion reported for high-pull headgear is questionable.

CRD commentary
The review question was clear but the inclusion criteria were only partially specified. The authors searched a number of relevant databases and made additional attempts to locate studies, but did not report searching for unpublished studies; this might have increased the possibility that some relevant studies were not included in the review. The authors used appropriate methods to minimise bias and error when selecting studies for the review, but did not report doing so when extracting the data. They also did not report undertaking a formal assessment of study validity. As only one study was included in the review, a synthesis could not be attempted. The authors' cautious conclusions reflect the fact that only one small non-randomised study was included in the review, and their recommendations for further research appear appropriate.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that randomised clinical trials should be carried out to evaluate true molar intrusion and consider normal craniofacial growth.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.