Which surgical approach for palatally displaced canines?

Abstracted from

Parkin N, Benson PE, Thind B, Shah A, Khalil I, Ghafoor S.

Open versus closed surgical exposure of canine teeth that are displaced in the roof of the mouth.
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Question: Does open or closed surgical exposures of palatally displaced canines affect clinical outcomes?

Data sources Cochrane Oral Health's Trials Register, Cochrane Central Register of Controlled Trials, Medline Ovid and Embase Ovid (up to February 2017); ongoing clinical trials were searched in clinicaltrials.gov as well as the World Health Organization International Clinical Trials Registry. Reference lists of included studies and relevant systematic reviews were searched. No restrictions were placed on the language or date of publication and study authors were contacted when necessary.

Study selection Randomised and quasi-randomised controlled trials assessing open and closed surgical exposures in palatally displaced canines with no restriction on age, presenting malocclusion or type of orthodontic treatment. Unilaterally and bilaterally displaced canines were included in the review. The primary outcomes considered were sufficient eruption of the canine to allow orthodontic alignment without requiring additional surgery, post surgical complications and aesthetics.

Data extraction and synthesis Two authors independently screened titles and abstracts of all studies identified through the search and reviewed full articles against established inclusion criteria. Any disagreements between the authors were resolved by consensus or by consulting an expert. Risk of bias assessment was done using Cochrane Collaboration's tool and study authors were contacted for missing information. Dichotomous outcomes (success of surgery - yes or no) were expressed as risk ratio and 95% CI. Continuous outcomes (pain on VAS scale) were expressed as mean differences (MD) or standardised mean differences (if different scales were used).

Results A total of three studies (six articles) representing 146 participants were included in the SR. One was an RCT while the other two were quasi-RCTs. With regards to successful eruption, there was no evidence of a difference between the open and closed groups (RR 0.99, 95% CI 0.93-1.06, P = 0.79). Other primary measures (including surgical complications or aesthetics) or secondary measures were either reported in just one trial or used different measures, so pooling of data was not possible.

Conclusions Limited available evidence suggests surgical exposure of palatally displaced canines is successful in bringing canines into alignment. However, data do not support one technique over the other (closed vs open). One trial was at low risk of bias while the others were at high risk of bias. This adds to the uncertainty of the conclusions.

This paper is based on a Cochrane Review published in the Cochrane Library 2017, issue 8 (see www.thecochranelibrary.com for information). Cochrane Reviews are regularly updated as new evidence emerges and in response to feedback, and the Cochrane Library should be consulted for the most recent version of the review.

Commentary

Clinical question and literature search: this review addresses a clearly focused question: *'In patients with palatally displaced canines, does open or closed surgical exposure result in better outcomes?'* Both clinically relevant (improved eruption, gum health) as well as patient-centred outcomes (post-surgical complications, aesthetics) were considered.

The authors performed a comprehensive literature search in multiple databases and appropriately restricted randomised controlled trials (RCT) and quasi-RCTs, comparing open and closed surgical approaches for palatally displaced canines. No restriction was placed on language or year of publication.

Risk of bias assessment: the authors assessed risk of bias of each included study using a domain-based Cochrane tool. The risk of bias was reported for each domain and the overall risk of each individual study was appropriately assigned.

Results: the authors used three pre-specified criteria to screen published literature and arrived at six articles reporting three trials (one RCT and two quasi-RCTs) to be included in the SR. There was incomplete reporting about the primary outcome in two of the three included studies. Credit should go to the review authors for reaching out to the study team about missing data about the success of surgical intervention. This at the very least informed that there are no significant differences in canine eruption after open or closed surgical exposure. Data for most of the other outcomes could not be pooled due to differences in outcome data.

A previous version of this Cochrane review[1] on the same topic found no RCT or quasi-RCT; reported one ongoing clinical trial and excluded six non-randomised or cohort studies. Even though the current update included three trials, they excluded the same six studies. However, given the scarce and more importantly, poor quality of included quasi-RCTs, it would have been beneficial to include 'lower quality' observational studies. This issue was highlighted in a recent methodological review that emphasised the need to incorporate data from observational studies to complement RCTs.[2] Inclusion of the observational studies could have increased the strength of evidence in primary and secondary outcomes.

Practice points

- There is no significant difference in the successful eruption of palatally displaced canines following open or closed surgical exposure.
- Given the effectiveness of both approaches, personal preference of the oral surgeon and the orthodontist would dictate choice of approach.
- Ongoing clinical trials would shed more light on the choice of surgical technique (open vs closed) on periodontal health, keratinised tissue width, aesthetics and treatment duration.

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1. Parkin N, Benson PE, Thind B, Shah A. Open versus closed surgical exposure of canine teeth that are displaced in the roof of the mouth. *Cochrane Database Syst Rev* 2008; **4:** Art. No.: CD006966. DOI: 10.1002/14651858.CD006966.pub2.
2. Meta-analyses including non-randomized studies of therapeutic interventions: a methodological review. *BMC Med Res Methodol* 2016; **16:** 35.

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