

Serial Extractions and Late Premolar Extractions Yield Similar Crowding Outcomes Post-Orthodontic Treatment

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Clinical Problem

Orthodontists have been shifting away from performing **serial extractions** and are more commonly using **late premolar extractions** to treat tooth-size-arch-length discrepancies. It is, however, necessary to determine whether this shift is evidence-based or simply a clinician preference. The purpose of this CAT is to compare how **serial extractions** and **late premolar extractions** influence crowding post-orthodontic treatment.

Clinical Question

For orthodontic patients with arch-length deficits, does serial extraction, as compared to late premolar extraction, result in less crowding?

Search Strategy

"Dental Arch" [Mesh] AND arch length deficiency.mp AND crowd*.mp AND ("Serial Extraction" [Mesh] OR serial extraction*.mp OR early adj3 orthodonti*.mp OR early adj3 premolar extraction*.mp) AND (late adj3 orthodonti*.mp OR late adj3 premolar extraction*.mp))

Search date: Jan. 16 2020
PubMed yield: 13 evidence sources
Additional search: TRIP Database, Cochrane

Selected Study

- Filho et al., 2015 (PMID: 25208231)
- Systematic review (6 retrospective experimental studies)
 - Sample size, total: 219 early treatment; 199 late treatment
 - Interventions:
 - Treatment 1: late first premolar extraction
 - Treatment 2: serial extraction
 - Primary Outcome: correction of severe crowding
 - Secondary Outcome: postretention crowding relapse, apical root resorption, soft tissue profile, duration of treatment

References

Lopes Filho H, Maia LH, Lau TC, de Souza MM, Maia LC. **Early vs late orthodontic treatment of tooth crowding by first premolar extraction: A systematic review.** Angle Orthod. 2015 May;85(3):510-7. doi: 10.2319/050814-332.1. Epub 2014 Sep 10. PMID: 25208231.

Serial extraction image: Marwah N. Textbook of pediatric dentistry. JP Medical Ltd; Chapter 36 - Serial extractions. 2014

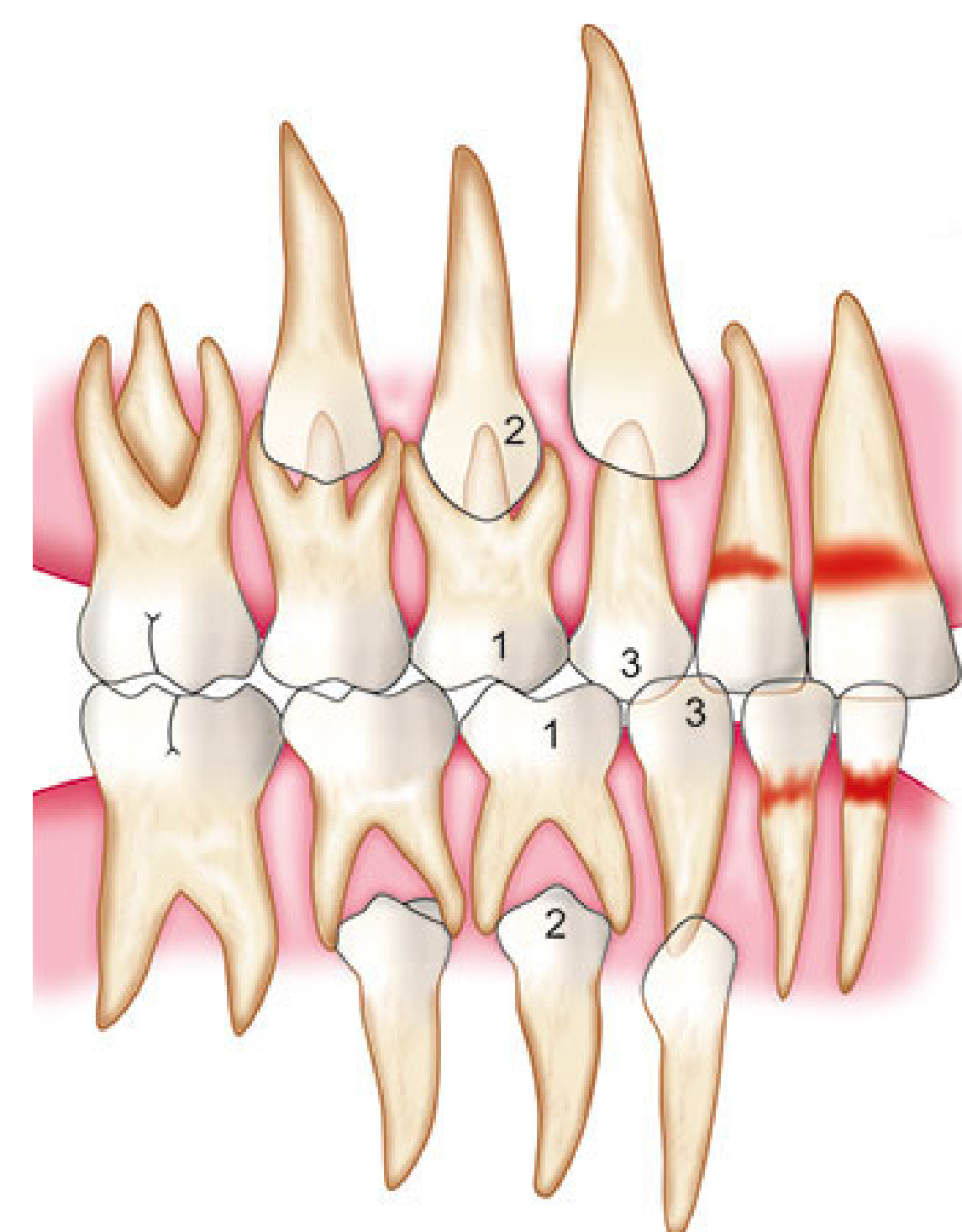
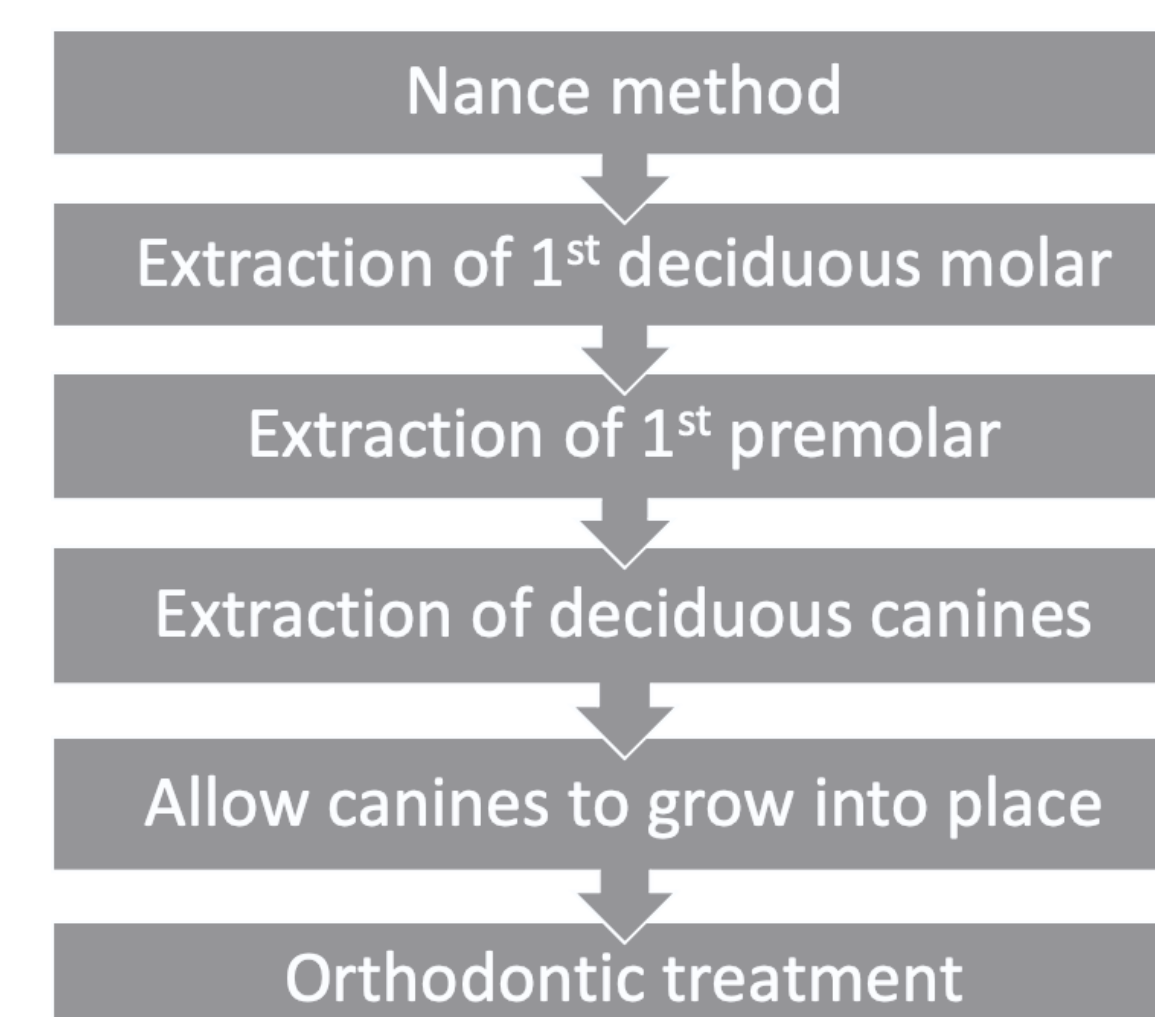
Late premolar extraction image: smilestudioortho1. (2016, July 18). Upper 2nd Bicuspid Extraction - Overjet - Orthodontic Treatment. YouTube. https://m.youtube.com/watch?v=_IAWs05F_xY.

Clinical Bottom Line

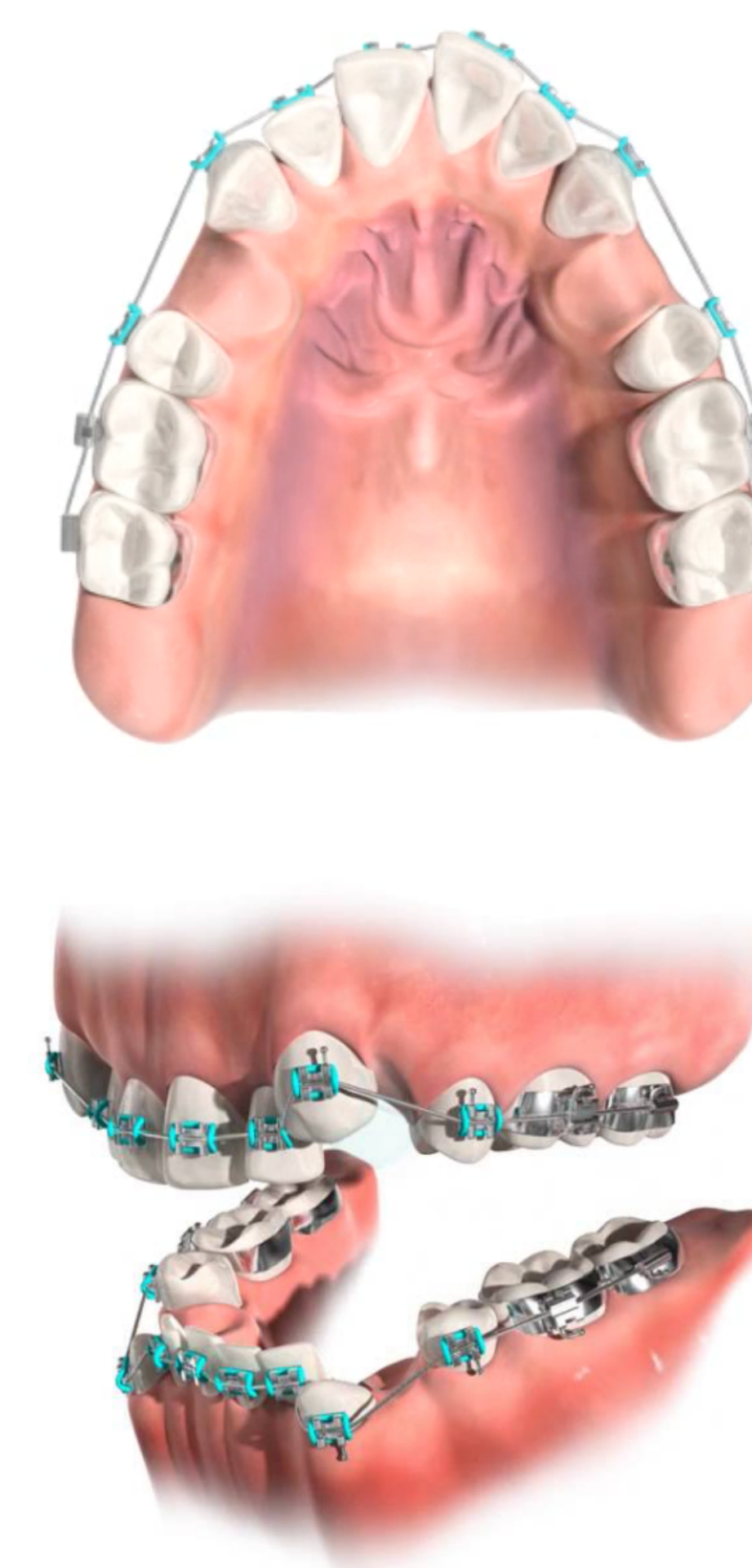
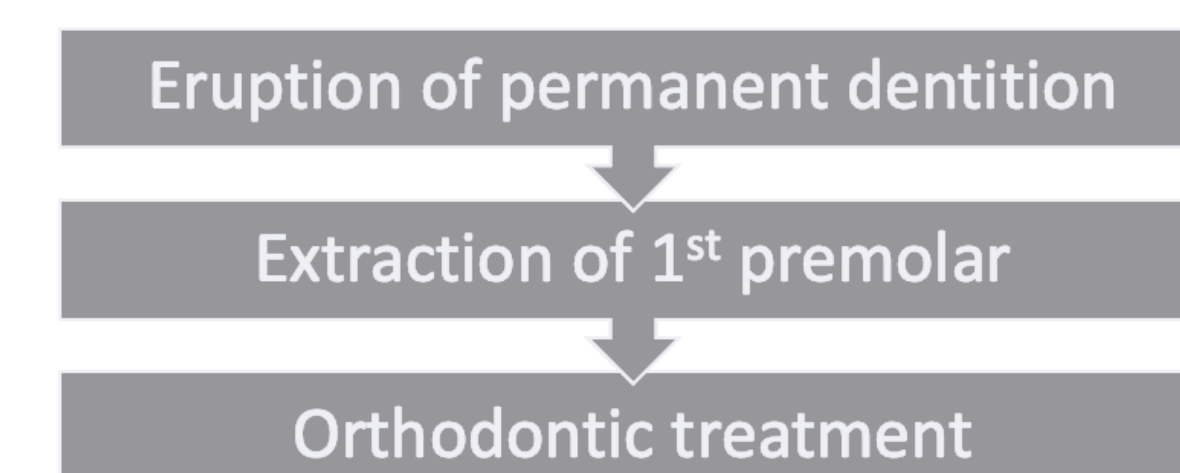
Both **serial extractions** and **late premolar extractions** yield **similar outcomes** post-orthodontic treatment.

The treatment of choice should be selected based on convenience and patient preference.

Serial extractions



Late premolar extractions



Analysis

Only three studies included in the systematic review matched our clinical question. Effect sizes were:

- PAR : 0.47 (95%CI -0.37 to 1.31) (O'Shaughnessy et al., 2009)
- PAR : 2.60 (95%CI 0.17 to 5.03) (Haruki & Little, 1998)
- II : -0.16 mm (95%CI -1.16 to 0.84) (Wagner & Berg, 2000)

Peer Assessment Review (PAR): a score that ranks how far a case deviates from ideal occlusion, while taking into consideration all occlusal anomalies.

Irregularity Index (II): measures the amount of crowding in the mandibular anterior teeth.

Evidence Quality

- The results of all 3 studies are clinically decisive, demonstrating no clinically meaningful difference of amount of crowding between groups.
- The SR was done in accordance with PRISMA, had no language limits, reviewers worked independently and the quality of the assessment tool used was validated.
- The quality was compromised as no meta-analysis was conducted, only retrospective study designs were included, the measurement methods were not standardized, there was no untreated control group, there was a lack of proper/constant follow-up and the potential of harms and costs of the interventions were not analyzed.

Applicability

- In Canada, serial extractions are not very feasible to implement into clinical practice. Late extractions are also logistically easier.
- The systematic review matched our population in question.
- The cost of serial extraction is covered for children under 10 years old in Quebec until a certain point. The premolar extractions and the orthodontic work would not be covered.
- The settings in which these studies were performed were mostly university clinics, in which the follow up times are different from Canadian private practices, for instance.

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QR Code