



Effect of Third Molar on Lower Anterior Crowding: A Review

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Abstract

Lower anterior crowding is a common clinical concern with multifactorial etiology, often debated in relation to the role of mandibular third molars. While the “pushing theory” suggests erupting third molars exert mesial forces that lead to anterior tooth displacement, high-quality longitudinal studies and systematic reviews reveal inconsistent and generally weak evidence supporting this link. More influential factors include late mandibular growth, tooth–arch size discrepancies, periodontal fiber activity, genetic predisposition, and inadequate post-orthodontic retention. Contemporary evidence does not justify routine prophylactic extraction of healthy third molars solely to prevent crowding. Extraction should be reserved for cases with clear pathological or functional indications, such as impaction, infection, root resorption risk, or interference with planned treatment. Long-term retention protocols remain the most effective strategy for maintaining post-orthodontic alignment. Clinicians must employ evidence-based decision-making and educate patients on the multifactorial causes of crowding and the limited role of third molars.

Introduction

Lower anterior crowding refers to the irregular alignment and overlapping of the mandibular incisors due to a mismatch between tooth size and available arch length, and it may present as primary crowding (present from early mixed dentition due to inherent tooth-size arch-length discrepancy), secondary crowding (developing during the mixed-to-permanent dentition transition, often linked to mesial migration of teeth after premature deciduous tooth loss or eruptive patterns), or tertiary or late crowding (occurring in late adolescence or early adulthood, often post-orthodontic treatment and sometimes associated with third molar eruption).¹ Beyond its orthodontic implications, lower anterior crowding affects dental esthetics, can complicate oral hygiene, increase susceptibility to caries and periodontal disease, and compromise occlusal stability, making it a persistent concern in relapse prevention and retention strategies.² The third molar hypothesis, supported historically by clinicians such as Begg, Timmons, and Richardson, suggests that eruptive forces from mandibular third molars particularly when there is

insufficient retromolar space can exert mesial pressure on the dentition, reduce arch length and width, and worsen anterior crowding, with some advocating prophylactic extraction to mitigate this risk.³ Evidence on this relationship, however, remains conflicting: certain literature reviews and systematic analyses associate the presence of mandibular third molars with greater lower incisor irregularity (measured by Little’s Irregularity Index) and decreased arch dimensions, while several longitudinal studies and randomized trials report no statistically significant correlation between third molar presence, absence, or angulation and lower anterior crowding; more recent CBCT-based studies have shown a positive correlation but are limited by small sample sizes.⁴ This unresolved controversy carries significant clinical consequences, influencing orthodontic retention planning, surgical decision-making on prophylactic removal in asymptomatic patients, and the accuracy of patient counseling.⁵ This article gives an overview on the effect of 3rd molars on lower anterior crowding



Review of Literature

Several studies have investigated the potential association between mandibular third molars and lower anterior crowding, with mixed findings. Some research, particularly in patients without prior orthodontic treatment, has reported a positive correlation, such as the study by Palikaraki et al. (2023)⁶ and a retrospective analysis by Gopalasamy et al. (2020)⁷, which found that 70.39% of individuals presenting with lower anterior crowding had mandibular third molars, suggesting a possible contributory role. However, high-level evidence from systematic reviews, including those by Lyros et al. (2023)⁸ and Assali et al. (2022)⁹, indicates no statistically significant relationship between third molar presence and crowding relapse following orthodontic treatment. Proposed mechanisms for the observed association include the differential mandibular growth theory, whereby continued mandibular growth may lead to uprighting of incisors and subsequent crowding, a process that could be exacerbated by third molars (Gopalasamy et al., 2020)⁷, as well as the hypothesis that erupting third molars exert forward pressure on the dentition (Machado et al., 2008).¹⁰ Nevertheless, many researchers contend that third molars are not the sole etiological factor, and the multifactorial nature of crowding should be emphasized. From a clinical perspective, the current body of evidence does not support the routine prophylactic removal of third molars solely to prevent anterior crowding, and management decisions should instead be based on a comprehensive evaluation of all contributing factors rather than attributing causation exclusively to third molars (Lyros et al., 2023; Assali et al., 2022; Machado et al., 2008).⁴

Etiology of Lower Anterior Crowding

Lower anterior crowding is a prevalent dental condition primarily arising from a mismatch between tooth size and available arch space, with multiple factors largely independent of third molars contributing to its development. Arch length deficiency, whether due to natural growth changes or tooth migration, can reduce the perimeter available for incisor alignment, while discrepancies between tooth size and jaw dimensions, often influenced by genetic and environmental factors, exacerbate crowding, particularly when teeth possess larger mesiodistal widths.¹⁰ Over time, a natural reduction in intercanine width, along with mesial drift

and posterior tooth movement, further diminishes anterior arch length. Soft tissue pressures from lips, cheeks, tongue, and periodontal membrane imbalances, coupled with early primary tooth loss or the absence of physiological attrition in modern diets, can also disrupt spacing.¹¹ Genetic inheritance of arch form, tooth dimensions, and soft tissue characteristics plays a significant role, while late mandibular growth continuing even after skeletal maturity via condylar activity can retrocline or upright lower incisors, reducing forward space and increasing overlap.¹² Subtle interproximal wear, occlusal forces, and bone remodeling further influence tooth position over time. Orthodontic consensus recognizes crowding as a multifactorial phenomenon influenced by skeletal growth patterns, tooth morphology, connective tissue changes, occlusal dynamics, soft tissue forces, and environmental habits. In essence, lower anterior crowding results from a complex interplay of biological, developmental, and environmental factors, with third molars representing a variable and controversial contributor rather than the sole or primary cause in most cases.¹³

Biomechanical ("Pushing") Theory: Third Molars and Anterior Crowding

The biomechanical or "pushing" theory suggests that erupting mandibular third molars generate a mesial (forward) force transmitted through interproximal contacts along the dental arch, sequentially moving molars, premolars, and ultimately the anterior teeth forward, thereby reducing available space and causing lower incisor crowding.¹⁴ While the mechanism appears plausible, direct biomechanical evidence remains weak; studies measuring mesial eruptive forces have generally found them minimal and insufficient to significantly influence anterior alignment, and interdental force measurements have failed to show a sustained pressure increase attributable to third molar eruption.¹⁵ Split-mouth and longitudinal studies, where third molars were removed on one side and retained on the other, typically reveal no significant difference in crowding between sides, and systematic reviews consistently conclude that there is no robust clinical or biomechanical evidence to support third molars as a primary cause of anterior crowding especially since similar age-related increases in crowding occur in individuals without third molars.¹⁶ Counterarguments emphasize that any eruptive forces



are small, often dissipated by periodontal structures before reaching the anterior segment, and that numerous observational studies show no correlation between third molar presence, position, or angulation and incisor crowding. Consequently, most professional guidelines discourage prophylactic removal of asymptomatic third molars solely to prevent crowding, as the condition is now understood to be multifactorial, influenced by skeletal growth patterns, natural arch changes, tooth-size to arch-size discrepancies, soft tissue forces, and environmental factors, with third molars representing at most a minor and inconsistent contributor.¹⁷

Confounding Factors for Lower Anterior Crowding

Lower anterior crowding frequently develops due to a combination of growth-related, periodontal, retention-related, and genetic factors that often outweigh the influence of mandibular third molars. Late mandibular growth, continuing into late adolescence and early adulthood through condylar development, can displace lower incisors lingually and reduce available arch space, particularly since maxillary growth ceases earlier; differential growth rates between the jaws, along with increased lip and cheek pressures, further exacerbate this crowding tendency.¹⁸ The periodontal ligament especially the transseptal fiber system maintains interproximal contacts but can also contribute to gradual positional shifts through continuous remodeling under occlusal and masticatory forces, particularly if dental equilibrium is disturbed. Post-orthodontic retention is another crucial determinant, as relapse in lower incisor alignment is common without consistent use of fixed or removable retainers and occurs regardless of third molar presence, underscoring that retention failure is a major contributor to crowding. Genetic predisposition also plays a significant role, influencing tooth size-to-arch size ratios, arch form and width, and eruption patterns, all of which directly impact anterior alignment. Collectively, these factors highlight that lower anterior crowding is most often the result of a multifactorial interplay of skeletal growth, soft tissue pressures, periodontal adaptation, retention compliance, and inherited traits, with third molars representing, at best, a secondary and inconsistent influence.¹⁹

Clinical Implications and Recommendations on Third Molar Extraction for Crowding Prevention

Current high-quality evidence, including randomized

controlled trials, systematic reviews, and long-term observational studies, consistently demonstrates no reliable benefit in routinely extracting mandibular third molars solely to prevent lower anterior crowding, with most orthodontists and oral surgeons agreeing that prophylactic removal for this purpose is ineffective.²⁰ Split-mouth studies and biomechanical analyses have shown that removal has minimal impact on interdental forces or relapse rates, and major guidelines, such as those from NICE and SIGN, advise against extraction of healthy, asymptomatic third molars when the only justification is crowding prevention, instead recommending ongoing monitoring in the absence of pathology.²¹ Extraction should be reserved for clear clinical indications, including impaction with associated risks of pericoronitis or infection, pathological findings such as cysts or tumors, interference with planned orthodontic or prosthetic treatment, evidence of root resorption or damage to adjacent teeth, and periodontal compromise or non-restorable caries linked to the third molar.²² In patient communication, clinicians should emphasize that lower anterior crowding is multifactorial driven by factors such as arch length discrepancies, late mandibular growth, genetics, and retention compliance dispel the common myth that wisdom teeth are the sole cause, and engage in shared decision-making by outlining individual risks, benefits, and alternatives.²² For patients retaining healthy third molars, regular clinical and radiographic monitoring is essential, with extraction reserved for evolving or high-risk situations.²³ Critically, post-orthodontic retention through fixed or removable retainers remains the most effective and evidence-supported method of preventing relapse, with alignment stability dependent far more on proper retention protocols and patient adherence than on third molar status, underscoring that relapse is most often attributable to inadequate retention rather than eruptive forces from wisdom teeth.^{24,25}

Conclusion

The current body of evidence does not justify the routine prophylactic extraction of mandibular third molars solely for the prevention of lower anterior crowding. Although a few studies suggest a weak association between the presence of third molars and anterior crowding, high-quality longitudinal research and systematic reviews consistently indicate that crowding is a multifactorial condition, predominantly influenced by late mandibular



growth, tooth–arch size discrepancies, periodontal fiber activity, insufficient post-orthodontic retention, and genetic predisposition. While third molars may contribute in a minor and variable manner in select cases, they are not a primary etiological factor. The most reliable strategy for preventing post-orthodontic relapse remains long-term retention supported by proper follow-up and patient compliance. Third molar extraction should therefore be reserved for cases with clear clinical indications—such as impaction with associated pathology, root resorption, periodontal compromise, or interference with planned orthodontic or prosthetic treatment—and should not be undertaken solely as a preventive measure for crowding.

References

1. Ruba J Mohammad, The Relationship of Mandibular Wisdom Tooth Within the Crowding of Lower Anterior Teeth—A Literature Review, *J Res Med Dent Sci*, 2021, 9(9): 160-165
2. Portillo FRL. Dental crowding: a review. *Int J Res Med Sci*. 2024 Apr;12(4):1344-8.
3. K Bergstorm, R Jensen. Responsibility of the third molar for secondary crowding.
4. Gökçe G, Akan B, Veli I. The role of impacted third molar angulation on the anterior crowding. *APOS Trends Orthod* 2021;11(1):56-61.
5. Lyros I, Vasoglou G, Lykogeorgos T, Tsolakis IA, Maroulakos MP, Fora E, Tsolakis AI. The Effect of Third Molars on the Mandibular Anterior Crowding Relapse—A Systematic Review. *Dent J (Basel)*. 2023 May 9;11(5):131. doi: 10.3390/dj11050131. PMID: 37232782; PMCID: PMC10217727.
6. Palikaraki G, Mitsea A, Sifakakis I. Effect of mandibular third molars on crowding of mandibular teeth in patients with or without previous orthodontic treatment: a systematic review and meta-analysis. *Angle Orthod*. 2024 Jan 1;94(1):122-132. doi: 10.2319/032323-205.1. PMID: 37848193; PMCID: PMC10928940.
7. Aldhorae, K., Ishaq, R., Alhaidary, S. et al. The association of third molars with mandibular incisor crowding in a group of the Yemeni population in Sana'a city: cone-beam computed tomography. *BMC Oral Health* **25**, 410 (2025). <https://doi.org/10.1186/s12903-025-05733-9>
8. Assali ,Devi A, Mushtaq M. Assessment of effect of third molars on lower anterior crowding. *J Adv Med Dent Scis Res*. [Internet]. [cited 2021 Aug 12]; Available from: <https://doi.org/10.21276/jamdsr>
9. Gopaldasamy, Jain A, Sonwane S. Evaluation of effect of third molars on lower anterior crowding. *Indian J Orthod Dentofac Res*. 2020 Jul-Sep;2(3):123-5.
10. Demyati AK, Badgaish FA, Alzahrani RA, Aleshli RO, Alnuayri SA, Alqutub AW, Ghandourah AO. Assessment of the relationship between impacted mandibular third molars' angulation pattern and crowding severity: A cross-sectional study. *Saudi Dent J*. 2024 May;36(5):789-94.
11. Patano A, Malcangi G, Inchingolo AD, Garofoli G, De Leonardis N, Azzollini D, Latini G, Mancini A, Carpentiere V, Laudadio C, Inchingolo F, D'Agostino S, Di Venere D, Tartaglia GM, Dolci M, Dipalma G, Inchingolo AM. Mandibular Crowding: Diagnosis and Management—A Scoping Review. *J Pers Med*. 2023 Apr 29;13(5):774. doi: 10.3390/jpm13050774. PMID: 37240944; PMCID: PMC10222176.
12. Consolaro A, Cardoso MA. Mandibular anterior crowding: normal or pathological? *Dental Press J Orthod*. 2018 Mar-Apr;23(2):30-36. doi: 10.1590/2177-6709.23.2.030-036.oin. PMID: 29898155; PMCID: PMC6018449.
13. Gill D. Incisor crowding [Internet]. London (UK): UCLH Eastman Dental Hospital; [cited 2025 Aug 12]. Available from: https://www.watfordorthodontics.co.uk/files/9815/1250/8442/Incisor_crowding.pdf
14. MG Angelis, S Blasi, P Pesce, V Lanteri. Third molars and dental crowding: different opinions of orthodontists and oral surgeons among Italian practitioners.
15. A Sidlauskas, G Trakiniene. Effects of lower third molar on the lower dental arch crowding.
16. RG Kaplan. Mandibular third molars and post retention crowding. *Am J Orthod Dentofac Orthop* 1974.



17. Kumar A, Bhandhari M, Fareeduddin MB. The effects of erupting mandibular 3rd molar on the dental arch: A FEM study. *IP Indian J Orthod Dentofacial Res.* 2022;8(3):173-9. Available from: <https://www.ijodr.com/>
18. Oksayan R, Topçuoğlu T. Effects of mandibular third molar angulation and position on crowding. *Turk J Orthod.* 2013;26(3):108-12.
19. Lindqvist B, Thilander B. Extraction of third molars in cases of anticipated crowding in the lower jaw. *Am J Orthod.* 1982; 81:130–139.
20. Shah SJ, Alshehri HAJ, Yaqoob A, Khateeb S. Influence of impacted lower third molar teeth on teeth crowding. *Int J Dent Med Sci Res.* 2023;5(6):5-8. doi:10.35629/5252-05060508
21. Zawawi KH, Melis M. The role of mandibular third molars on lower anterior teeth crowding and relapse after orthodontic treatment: a systematic review. *ScientificWorldJournal.* 2014;2014:615429. doi:10.1155/2014/615429.
22. Prasad K, Hassan S. Influence of third molars on anterior crowding – revisited. *J Int Oral Health.* 2011;3(3):37-40.
23. Genest-Beucher S, Graillon N, Bruneau S, Benzaquen M, Guyot L. Does mandibular third molar have an impact on dental mandibular anterior crowding? A literature review. *J Stomatol Oral Maxillofac Surg.* 2018;119(3):204-7.
24. Southard TE. Third molars and incisor crowding: when removal is unwarranted. *J Am Dent Assoc.* 1992 Aug;123(8):75-9. doi: 10.14219/jada.archive.1992.0224. Erratum in: *J Am Dent Assoc* 1992 Sep;123(9):11. PMID: 1506593.
25. Gavazzi M, De Angelis D, Blasi S, Pesce P, Lanteri V. Third molars and dental crowding: different opinions of orthodontists and oral surgeons among Italian practitioners. *Prog Orthod.* 2014 Nov 22;15(1):60. doi: 10.1186/s40510-014-0060-y. PMID: 25679500; PMCID: PMC4240869.