

Guiding Growth: Early Interceptive Orthodontics in Mixed Dentition — A Clinical Case Series

Abstract:

Background: Early orthodontic intervention is crucial for establishing functional and harmonious occlusion. Early interceptive modalities, particularly for crossbite, open bite, hypoplastic maxilla, developing class III malocclusion and oral habits, effectively restore normal occlusal relationships at the onset of malocclusion. Beyond tooth alignment, such treatments address skeletal discrepancies, improve oral function, and stabilise soft tissue posture to ensure long-term stability.

Case Presentation: This case series reports three patients aged 8–9 years in the mixed dentition stage, presenting with anterior open bite, anterior and posterior crossbite, developing class III malocclusion, constricted maxilla, mouth breathing and tongue thrusting habits. Management involved myofunctional exercises, habit breaking appliance, ENT referral and maxillary expansion to correct dental and functional discrepancies. It also includes protraction face mask therapy for correcting hypoplastic maxilla. At the 12-month follow-up, all cases demonstrated stable occlusal relationships consistent without relapse.

Conclusion: The presented cases illustrate that interceptive treatment during mixed dentition supports skeletal and airway development, while habit correction and myofunctional therapy enhance long-term stability. Early intervention reduces the complexity of later orthodontic needs, and interdisciplinary collaboration—particularly ENT referrals for mouth-breathing children optimizing the outcomes. The timely management prevents malocclusion progression and promotes balanced craniofacial development, highlighting the broader significance of interceptive care in paediatric dentistry.

Key-words: Crossbite, Interceptive Orthodontics, Mixed dentition, Pediatric Dentistry

Introduction:

The normal development and growth of the dentition is fundamental in establishing a harmonious occlusion.[1] The primary objective of early orthodontic treatment is to guide the dentition toward a functional and morphologically balanced occlusion.¹ The mixed dentition stage characterized by the coexistence of primary and permanent teeth, represents a critical phase in craniofacial development, offering a unique window of opportunity to influence skeletal and dental relationships before they become fully established.² According to Proffit et al., intervening between ages 6 to 9 enables clinicians to direct skeletal and dental development in a minimally invasive way, thereby reducing the complexity of subsequent orthodontic treatment.[3] Furthermore, the American Academy of Paediatric Dentistry highlights that key challenges in the developing dentition include skeletal Class

III malocclusion, anterior open bite, constricted maxillary arches, and tongue-thrusting habits, all of which require timely interceptive management to prevent progression and functional impairment.[4]

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Received : 3 Feb., 2026, **Published :** 30 June, 2026

Access this article online

Website:
www.ujds.in

DOI:
<https://doi.org/10.21276/ujds.2026.12.2.22>

How to cite this article: Doley, S., Peter, J., Gupta, S., Shrivastava, R., & Talukdar, A. (2026). Guiding Growth: Early Interceptive Orthodontics in Mixed Dentition — A Clinical Case Series. UNIVERSITY JOURNAL OF DENTAL SCIENCES, 12(2).

Skeletal Class III malocclusion, often due to maxillary deficiency or mandibular prognathism, benefits from early orthopaedic guidance to redirect growth and reduce future severity.[5] Anterior open bite, commonly linked to tongue-thrusting habits, compromises function, aesthetics, and speech and requires habit interception with myofunctional therapy.[6] A constricted maxilla limits arch development and space for erupting teeth and predisposes to crossbite.[7] Expansion during mixed dentition effectively corrects transverse discrepancies and improves airway dimensions.⁸ Tongue-thrusting further destabilizes occlusion and alters soft tissue posture, making early correction with exercises or habit-breaking appliances essential for functional equilibrium and long-term stability.[7] Collectively, these interventions highlight the importance of interceptive care in paediatric dentistry, where multidisciplinary collaboration and timely management foster balanced craniofacial development, optimize oral function, and enhance overall treatment outcomes. Thus, this article presents a case series on interceptive orthodontic protocols in mixed dentition, emphasizing their role in guiding growth trajectories, arresting advancement of malocclusions and ensuring functional stability.

Case Report:

Case-1

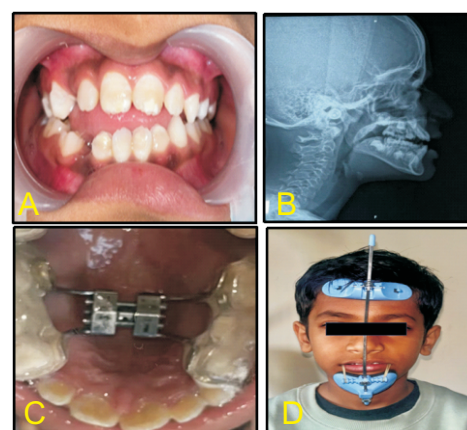
An 8-year-old male patient reported to our clinic with a chief complaint of difficulty in biting and irregularly placed teeth persisting for the past two years. The patient's family and medical history were non-contributory. Extraoral examination revealed a Class III facial profile characterized by midface deficiency and a protrusive mandible. Intraoral examination demonstrated an anterior open bite, unilateral posterior crossbite, and a constricted maxillary arch. Functional evaluation further revealed chronic mouth breathing since birth, tongue-thrusting habit, and low tongue posture. Radiographic assessment included an orthopantomography and lateral cephalogram for space analysis which confirmed arch length discrepancy. Diagnosis was confirmed as Skeletal Class III tendency with underdeveloped maxilla and anteriorly positioned mandible.

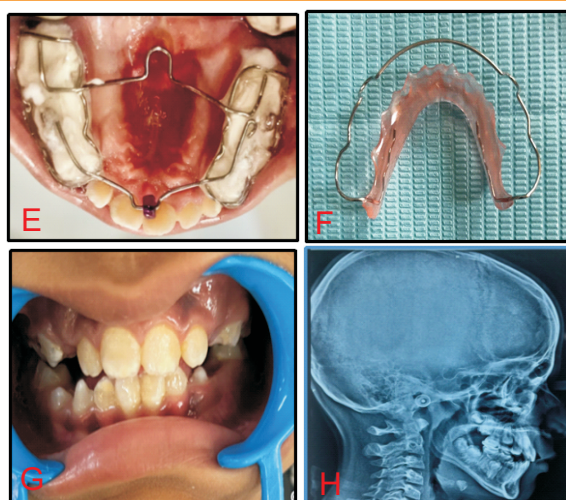
Based on the clinical and radiographic findings, a comprehensive interceptive treatment plan was formulated to address the skeletal, dental, and functional discrepancies. The patient was first referred to an ENT specialist to address chronic mouth breathing and associated airway concerns. Breathing exercises and myofunctional tongue exercises were initiated to improve nasal respiration and tongue posture. Orthopaedic intervention began with the placement of a bonded rapid maxillary expander (RME) to correct the

constricted maxilla and create adequate tongue space. This was followed by protraction facemask therapy to stimulate forward and downward growth of the maxilla. A trans-palatal arch with a Bluegrass appliance was incorporated to discourage tongue-thrusting habits. Myofunctional therapy was continued throughout treatment to reinforce proper tongue positioning and prevent relapse of the anterior open bite. For retention, a Begg's appliance was prescribed, with instructions for full-time wear over six months, followed by nighttime wear. Additionally, a palatal crib was provided to maintain the corrected arch form and anterior relationship while preventing recurrence of tongue thrust.

The patient was closely monitored at regular intervals to evaluate skeletal, dental, and functional changes during treatment. At one-month, initial maxillary expansion was achieved with partial correction of the posterior crossbite, alongside improved nasal breathing and early adaptation to myofunctional exercises. By six months, maxillary advancement was evident with forward growth stimulation and reduced mandibular prominence. The anterior open bite showed marked improvement and the posterior crossbite was fully corrected. Tongue posture began shifting from a low, posterior position to a higher, forward placement with increased palatal contact. At the one-year follow-up, a balanced skeletal relationship was established with stable correction of both anterior open bite and posterior crossbite. Facial aesthetics improved with enhanced midface projection, while functional correction was confirmed through proper tongue posture and nasal breathing. All clinical illustrations relevant to the cases discussed are presented in Figure 1.

Figure 1– Case 1 showing (a) Preoperative Frontal View (b) Preoperative Lateral Cephalogram (c) Bonded RME (d) Protractopm Face Mask (e) Transpalatal Arch with Blue Grass Appliance (f) Begg's Appliance (g) Postoperative Frontal View (h) Postoperative Lateral Cephalogram





Case-2

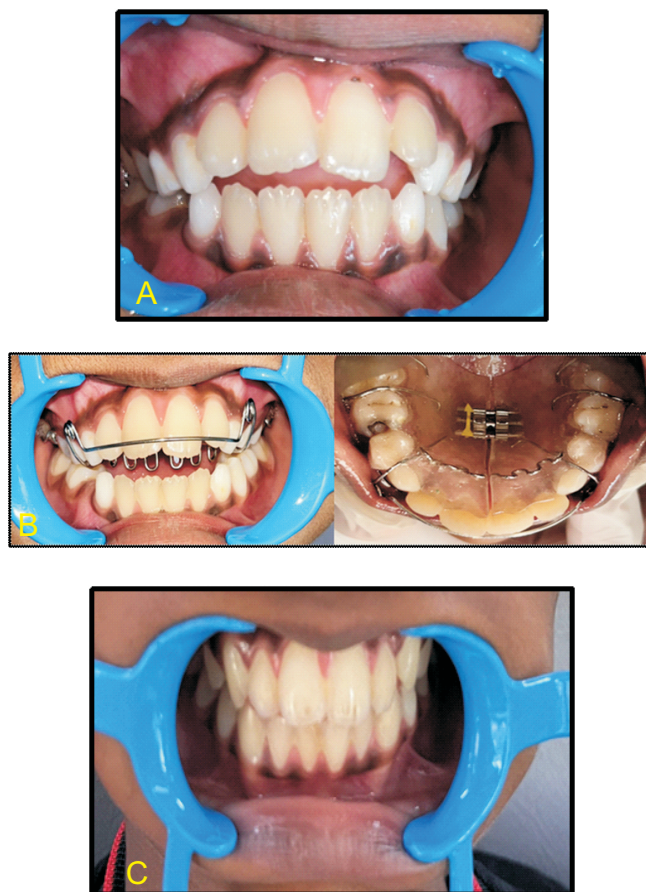
An 8-year-old male patient reported to our clinic with the chief complaint of forwardly placed upper front teeth and difficulty in closing the mouth. Family and medical history were non-contributory. Extraoral examination revealed mild facial asymmetry with incompetent lips at rest, while intraoral findings demonstrated an anterior open bite, proclined maxillary incisors, a functional midline shift and a tongue-thrusting habit in the mixed dentition stage. Functional assessment further highlighted abnormal tongue posture during swallowing and persistent lip incompetence. Radiographic evaluation with orthopantomography and lateral cephalogram confirmed arch length discrepancy and maxillary transverse deficiency, reinforcing the dental and functional components of the malocclusion. Based on these findings, the diagnosis was established as anterior open bite due to tongue thrust, functional midline shift, maxillary transverse deficiency and habit-associated malocclusion in the mixed dentition stage.

The treatment was carefully planned with the dual objective of intercepting the tongue thrusting habit and correcting maxillary arch constriction. Management began with myofunctional therapy aimed at retraining oral musculature and reinforcing proper tongue posture. Tongue exercises were prescribed to establish a physiologic resting position, while lip-strengthening exercises improved perioral muscle tone and promoted competent lip seal. These measures addressed the functional imbalance and supported orthodontic stability. Orthodontic appliance therapy followed, with slow maxillary expansion carried out using a split palatal crib. This appliance served a dual role: facilitating transverse arch development and acting as a physical reminder to discourage tongue thrust during swallowing. Expansion was gradual to allow physiologic adaptation of the maxillary sutures, and regular follow-up visits ensured proper appliance activation,

monitoring of tongue posture, and evaluation of occlusal changes. Parental involvement was emphasized to encourage compliance with exercises at home.

At follow-up, progressive improvements were noted. The anterior open bite was successfully resolved, tongue-thrust habit corrected, and the functional midline shift eliminated. Arch form improved significantly, resulting in better coordination and aesthetics. By the end of the retention phase, the patient demonstrated stable occlusion and normalized oral function. With these objectives achieved, the patient is now ready to proceed to Phase II treatment, which will focus on addressing maxillary protrusion and further refining occlusion. All clinical illustrations relevant to the cases discussed are presented in Figure 2.

Figure 2– Case 2 showing (a) Preoperative Photograph (b) Slow Maxillary Expansion with Split Palatal Crib (c) Postoperative Photograph



Case-3

An 8-year-old female reported to our clinic with the chief complaint of difficulty in biting and esthetic concern. The patient's family and medical history were non-contributory. Extraoral examination revealed a symmetrical face with

competent lips at rest while profile analysis demonstrated a convex facial profile with midface deficiency due to a retrusive maxilla, a straight nasolabial angle and features suggestive of a potential Class III skeletal tendency. Intraoral examination showed an anterior crossbite involving teeth 11 and 41, gingival recession in relation to tooth 41, constricted maxillary arch and moderate crowding in the mixed dentition stage. Functional evaluation further revealed chronic mouth breathing since birth. Radiographic assessment included an orthopantomograph and lateral cephalogram, which confirmed a skeletal Class III tendency primarily attributed to retroclined and palatally tipped maxillary incisors in crossbite with the mandibular incisors. The mandibular incisors were mildly proclined as a compensatory mechanism, contributing to gingival recession in the lower anterior region. Based on these findings, diagnosis was established as skeletal Class III tendency with anterior dental crossbite and transverse constriction of maxilla in the mixed dentition stage, associated with poor oral hygiene.

A four-phase interceptive treatment plan was designed to address the patient's dental, skeletal, and functional concerns. Phase 1 comprised of preventive and preparatory stage, during which oral prophylaxis and fluoride therapy were performed to improve oral hygiene and strengthen the dentition. Phase 2 focused on functional and orthopaedic correction. The patient was referred to an ENT specialist to rule out any upper airway obstruction contributing to chronic mouth breathing. Myofunctional and breathing therapy was initiated to educate tongue posture and promote nasal respiration. Interceptive intervention included use of a jack screw appliance to correct the anterior crossbite, followed by slow maxillary expansion with an anterior inclined plane to relieve transverse constriction and facilitate nasal breathing. The “foot and shoe” principle was applied to manage mandibular crowding, ensuring proper alignment and space utilization for erupting permanent teeth. Phase 3 emphasized growth guidance and monitoring, with regular follow-up to observe the eruption of permanent teeth and to consider early orthopaedic correction, such as facemask therapy, if the Class III skeletal growth pattern showed progression.

Following completion of active treatment, patient entered the retention phase and was closely monitored at regular intervals to evaluate stability and functional adaptation. At the one-month follow-up, anterior crossbite remained corrected with establishment of proper overjet and overbite, and early improvements in arch coordination were evident. By six months, dental alignment had become more harmonious, with enhanced aesthetics and marked improvement in soft tissue health, particularly in the gingival condition of the lower

anterior region. At one-year evaluation, functional outcomes were favourable, as the patient maintained improved breathing patterns with continued support from myofunctional therapy. Long-term monitoring confirmed stability of the corrected occlusion, a balanced skeletal relationship, and sustained improvements in both oral function and facial aesthetics. All clinical illustrations relevant to the cases discussed are presented in Figure 3.

Figure 3– Case 3 showing (a) Preoperative Photograph (b) Jack Screw Appliance (c) Slow Maxillary Expansion with Anterior Inclined Plane (d) Postoperative Photograph



Discussion:

The art of interceptive orthodontics lies not merely in correcting teeth, but in harmonizing growth, function, and aesthetics during the most formative years of a child's development. Interceptive orthodontics is most effective when addressing the combined effects of dental, skeletal and functional disturbances and the three cases presented in this series highlight how early intervention can produce stable and transformative outcomes.[9] In Case 1, the use of bonded rapid maxillary expansion with a protraction facemask stimulated maxillary advancement and controlled mandibular projection. This approach mirrors the findings of Ngan et al., who emphasized the skeletal benefits of early protraction therapy in Class III patients.[10] Similarly, Baccetti et al. demonstrated that orthopaedic correction during the mixed dentition stage yields more favourable skeletal changes compared to later intervention.[11] Westwood et al. further confirmed that facemask therapy, when combined with maxillary expansion, enhances forward displacement of the maxilla and improves facial aesthetics, reinforcing the rationale for early orthopaedic intervention in Class III malocclusions.[12]

Case 2 focused on eliminating tongue thrust and anterior open bite using a split palatal crib appliance in conjunction with myofunctional therapy. Habit interception was critical, as highlighted by Huang et al., who reported long-term stability when tongue posture is corrected during growth¹³. Subtelny et al emphasized the role of tongue function in maintaining vertical dimension and occlusal stability, while Proffit and Mason demonstrated that correcting oral habits early prevents relapse and reduces treatment complexity in adolescence^{14, 15}. These findings validate the combined appliance-and-exercise approach used in this case, underscoring the importance of functional rehabilitation alongside mechanical correction.

In Case 3, a jack screw appliance and anterior inclined plane were employed to expand the constricted maxilla and correct the anterior crossbite while breathing education supported functional improvement. Souki et al. highlighted that slow maxillary expansion improves nasal airflow and reduces mouth breathing, thereby enhancing orthodontic stability¹⁶. Villa et al. demonstrated that expansion combined with breathing therapy improves muscle tone and promotes nasal respiration in paediatric patients¹⁷. McNamara et al stressed the impact of functional orthopaedic intervention on facial proportions, showing that skeletal remodelling is more favourable when airway and muscular function are simultaneously addressed¹⁸. These studies collectively support the dual focus on orthopaedic correction and functional rehabilitation in mouth-breathing children.

Across all three cases, cephalometric and profilogram changes confirmed favourable skeletal remodelling, consistent with the principles outlined by Proffit, who emphasized that success in interceptive orthodontics lies in a multidisciplinary approach³. Collaboration with ENT specialists, integration of myofunctional therapy, and careful growth monitoring ensured long-term stability and aesthetic improvement. These cases highlight that early, individualized, and interdisciplinary management not only resolves immediate malocclusion but also sets the foundation for balanced growth and reduced treatment complexity in later years.

Conclusion:

Interceptive orthodontics during the mixed dentition stage offers a powerful opportunity to guide skeletal growth, improve airway function and prevent worsening of malocclusion. The cases demonstrated that habit correction and myofunctional therapy not only resolve immediate concerns but also enhance long-term stability. Early intervention reduces the complexity of later orthodontic needs, while interdisciplinary collaboration—particularly

with ENT specialists—ensures comprehensive management of mouth-breathing children. By combining orthopaedic correction, functional rehabilitation, and growth monitoring, interceptive treatment lays the foundation for balanced facial development, improved aesthetics, and sustained oral health. True success at this stage lies not only in aligning teeth alone—it is about harmonizing growth, restoring function and safeguarding airway health to secure stable and aesthetic outcomes for the child's future.

References:

1. Ackerman JL, Proffit WR. Preventive and interceptive orthodontics: a strong theory proves weak in practice. *Angle Orthod*. 1980;50(2):76–87.
2. Rao SJ, Spandana V, Uday Kumar D, Naik JS. Interceptive treatment protocol for orthodontic patients in mixed dentition period: case series. *IOSR Journal of Dental and Medical Sciences*. 2021 Apr;20(4, Ser.15):43-47.
3. Proffit WR, Fields HW, Sarver DM. Contemporary Orthodontics. 6th ed. St. Louis: Elsevier; 2019.
4. American Academy of Pediatric Dentistry. Management of the developing dentition and occlusion in pediatric dentistry. The Reference Manual of Pediatric Dentistry. Chicago, IL: American Academy of Pediatric Dentistry; 2025:497-515.
5. Pavoni C, Mucedero M, Lione R, Franchi L, Cozza P. Early treatment of dentoskeletal Class III malocclusion: SEC III protocol. *APOS Trends Orthod*. 2018;8(4):208-218.
6. Rao SJ, Kumar DU, Naik JS, Spandana V. Interceptive orthodontics: concepts and clinical considerations. *IOSR J Dent Med Sci*. 2018 Jun;17(6, Ver.5):49-54.
7. Almeida MR, Almeida RR, Almeida-Pedrin RR, Garib DG, Pinzan A, Janson G. Interceptive orthodontics: current evidence and clinical applications. *Appl Sci*. 2024;14(19):8700.
8. Shrivastava R. A case report on correction of tongue thrusting habit using fixed palatal crib appliance. *IOSR J Dent Med Sci*. 2021 Oct;20(10):5-7.
9. Graber LW, Vig KWL, Huang GJ, Fleming PS. Orthodontics: Current Principles and Techniques. 7th ed. Elsevier; 2022.
10. Ngan P. Early timely treatment of Class III malocclusion. *Semin Orthod*. 2005;11(3):140-145.
11. Baccetti T, McGill JS, Franchi L, McNamara JA Jr, Tollaro I. Skeletal effects of early treatment of Class III malocclusion with rapid maxillary expansion and facemask therapy. *Am J Orthod Dentofacial Orthop*. 1998;113(3):333-343. doi:10.1016/S0889-5406(98)70245-3

12. Westwood PV, McNamara JA Jr, Baccetti T, Franchi L, Sarver DM. Long-term effects of Class III treatment with rapid maxillary expansion and facemask therapy. *Am J Orthod Dentofacial Orthop.* 2003;123(3):306-320. doi:10.1067/mod.2003.4
13. Huang GJ, Justus R, Kennedy DB, Kokich VG. Stability of anterior open bite correction with crib therapy. *Am J Orthod Dentofacial Orthop.* 1990;97(5):393-404. doi:10.1016/0889-5406(90)70053-7.
14. Subtelny JD. Malocclusions, orthodontic corrections, and orofacial muscle adaptation. *Angle Orthod.* 1965;35(3):170-201.
15. Proffit WR, Mason RM. Myofunctional therapy for tongue-thrusting: background and recommendations. *J Am Dent Assoc.* 1975;90(2):403-411.
16. Souki BQ, Pimenta GB, Souki MQ, Franco LP, Oliveira DD, Pereira TB. Maxillary expansion and nasal airway resistance in children: a randomized clinical trial. *Am J Orthod Dentofacial Orthop.* 2009;136(5):641-648.
17. Villa MP, Malagola C, Pagani J, Montesano M, Rizzoli A, Guilleminault C. Rapid maxillary expansion in children with obstructive sleep apnea syndrome. *Sleep Med.* 2002;3(5):429-435.
18. McNamara JA Jr. An orthopedic approach to the treatment of Class III malocclusion in the mixed dentition. *Am J Orthod.* 1987;92(6):465-477.