



Short Communication

Suyamasi system: A mini implant supported system for molar distalization

Suresh Kundalikrao Kangane¹, Siddhant Ramesh Jadhav¹, Yatishkumar Satyanarayan Joshi¹,
Pravinkumar Sharnappa Maroore¹, Disha Limbraj Khandade¹, Riya Vishnu Bhangale¹

¹Dept. of Orthodontics and Dentofacial Orthopaedics, Maharashtra Institute of Dental Sciences & Research Dental College, Latur, Maharashtra, India

Abstract

Molar distalization plays a vital role in orthodontic treatment, particularly in cases requiring space creation or Class II correction. The Suyamasi System offers a mini-implant-supported approach that ensures controlled and efficient distalization with minimal anchorage loss. This system integrates a 0.019x0.025 stainless steel wire framework, secured with mini implants, Beggs tubes, and coil springs to generate consistent distalizing forces. A vertical wire extension rests on the mini implant, providing stable anchorage and precise force application. Light-cure composite enhances wire stabilization, while an acrylic block prevents unwanted reciprocal forces. By minimizing the need for patient compliance and optimizing force delivery, the Suyamasi System enhances treatment predictability, making it a valuable addition to contemporary orthodontic mechanics.

Keywords: Molar distalization, Skeletal anchorage, Orthodontic mechanics, Non-extraction treatment

Received: 28-06-2025; **Accepted:** 24-07-2025; **Available Online:** 15-10-2025

This is an Open Access (OA) journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License](https://creativecommons.org/licenses/by-nc-sa/4.0/), which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprint@ipinnovative.com

1. Introduction

Molar distalization is a crucial aspect of orthodontic treatment, particularly in cases requiring space creation for anterior alignment or Class II malocclusion correction.¹ Traditional extraoral approaches such as headgear have been widely used for molar distalization but are highly dependent on patient compliance, often leading to inconsistent results.² Intraoral distalization devices, including pendulum appliances, distal jets, and frog appliances, provide alternative means of achieving distal movement but may result in anchorage loss and mesial migration of anterior teeth.^{3,4}

The advent of skeletal anchorage has revolutionized orthodontic biomechanics by offering absolute anchorage for molar distalization without relying on posterior teeth or patient cooperation.^{5,6} Various mini-implant-supported distalization techniques have been introduced, such as the C-palatal plate, bone-anchored pendulum appliance, and buccally placed mini-implants with coil springs.^{7,8} These techniques enhance control over tooth movement and minimize unwanted side effects, making them valuable tools in non-extraction treatment planning.⁹

Despite advancements in mini-implant-assisted distalization, certain limitations persist, including the need for additional laboratory work, complex mechanics, and potential patient discomfort.¹⁰ The Suyamasi System (The name ‘Suyamasi System’ is derived from the primary contributor to the innovation, in recognition of the author’s role in developing the technique) is a novel clinical innovation designed to address these limitations by integrating a mini-implant-supported wire framework with a combination of Beggs tubes, coil springs, and composite blocks. This system ensures efficient distalization of maxillary molars while maintaining anchorage stability and minimizing reciprocal forces. The vertical extension of the wire framework resting on the mini-implant provides enhanced force control, reducing the risk of mesial drift of anterior teeth and anchorage loss.

Additionally, the Suyamasi System eliminates the need for complex laboratory procedures, offering a chairside-friendly, predictable, and minimally invasive approach for clinicians. By optimizing force application and ensuring better control over the distalizing movement, this system contributes to a more efficient and patient-friendly orthodontic treatment modality.

*Corresponding author: Siddhant Ramesh Jadhav
Email: siddhant.jadhav14@gmail.com

2. Materials and Methods

2.1 Materials

1. 0.019x0.025 stainless steel wire – for framework fabrication.
2. Universal plier – for wire bending.
3. Open coil springs – for force application.
4. Beggs brackets/tubes – for palatal anchorage.
5. Light-cure composite – for wire stabilization

3. Methodology

3.1. Fabrication of the suyamasi system

The 0.019×0.025 stainless steel wire is inserted into the molar tube, with a vertical extension incorporated to rest on a mini implant placed interdentally between the premolar and molar, ensuring stable anchorage. The wire is bent to pass through the interdental area and extends occlusally, with a U-shaped bend incorporated on the second premolar's disto-occlusal surface for stabilization. To prevent displacement, the wire is secured with light-cure composite. It then crosses palatally and bends parallel to the molar's palatal cuspal surface. Beggs tubes bonded on the palatal cusps of the molars provide additional support. Open coil springs ($0.010'' \times 0.036''$ NiTi open coil spring) are placed on the buccal and palatal sides before inserting the wire into the molar and Beggs tubes. (Figure 1) A composite block prevents unwanted force redirection and ensures effective distalization (Figure 2), (Figure 3). The applied distalization force ranged between 150–200 grams, calibrated based on the degree of spring compression.



Figure 1: Completed wire bending with composite block and open coil springs

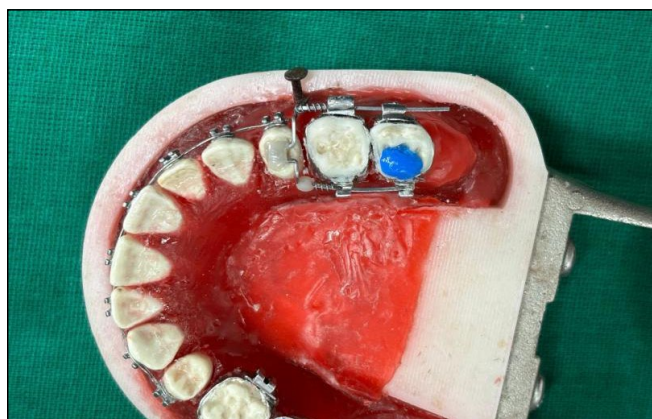


Figure 2: Occlusal view of Suyamasi system in place

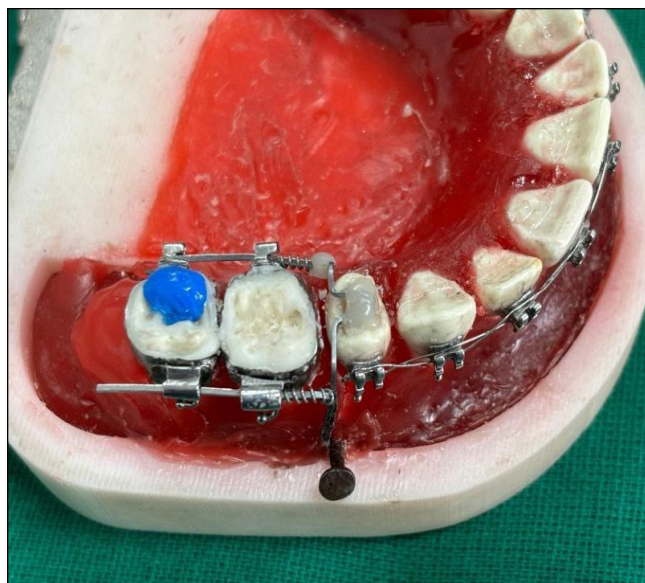


Figure 3: Composite block preventing unwanted force redirection

3.2. Simulation testing

The system was demonstrated on a typodont model to establish its biomechanical feasibility prior to clinical application. The system was tested on a model (Figure 4), which was submerged in a hot water bath to simulate soft tissue behavior and evaluate tooth movement. (Figure 5) Additional distalization can be achieved by compressing the coil springs using composite blocks. (Figure 6) A graduated probe confirmed successful 3 mm molar distalization following activation. (Figure 7) Typodont-based demonstration was chosen to allow early dissemination of the concept for academic and clinical discussion. This innovation has also received a copyright certificate Application number: 9538/2025-CO/L from "Copyright Office, Government of India". (Figure 8)



Figure 4: Side view of Suyamasi system in place (Mini implant is depicted by using a nail)

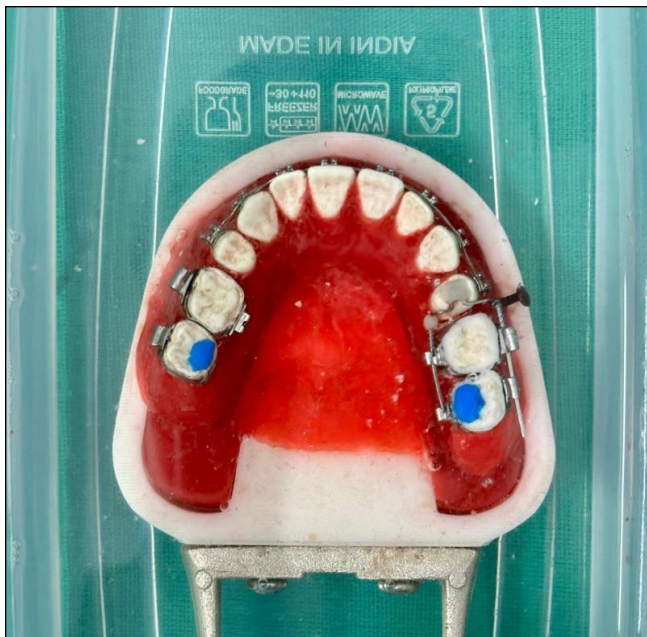


Figure 5: Jaw set is placed in hot water bath to predict the tooth movement



Figure 6: Additional distalization can be achieved by compressing coil springs using acrylic blocks

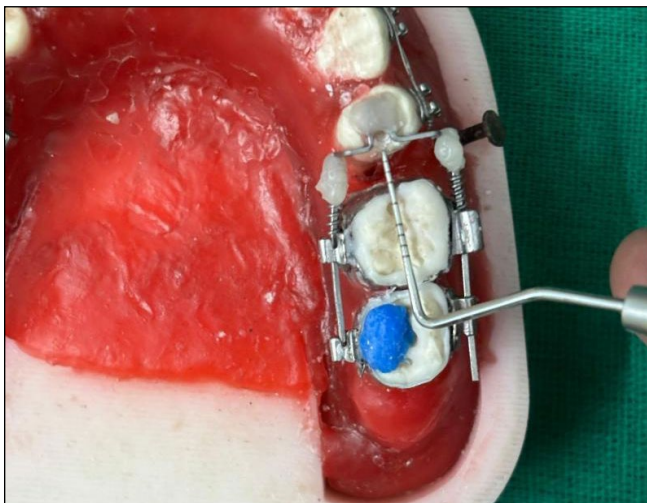


Figure 7: A graduated probe indicating a successful 3 mm molar distalization.



Figure 8: Copyright certificate for Suyamasi System

3.2.1. Advantages

1. **Enhanced anchorage:** Mini implant support prevents anchorage loss.
2. **Controlled force application:** Coil springs deliver a consistent and predictable distalizing force.
3. **Minimized unwanted tooth movement:** The design ensures selective force application to molars.
4. **Secure stabilization:** Light-cure composite and Beggs tubes enhance wire retention.
5. **Improved clinical outcomes:** Provides a reliable and efficient method for molar distalization in orthodontic treatment.

3.2.2. Disadvantages and limitations

1. **Lack of clinical validation:** The efficiency of the Suyamasi System has only been assessed on a simulated jaw model. Its performance in actual clinical conditions, where biological variability and patient-related factors come into play, remains untested.
2. **Absence of large-scale studies:** No longitudinal or large-sample clinical studies have yet been conducted to validate the effectiveness, safety, and long-term outcomes of this system.
3. **Technique sensitivity:** Precise wire bending and placement are essential for optimal force delivery. Minor errors in fabrication may lead to compromised performance.
4. **Mini-Implant dependence:** The success of the system relies heavily on the stability of mini implants, which can vary depending on bone density, insertion torque, and patient-specific anatomical limitations.

4. Conclusion

The Suyamasi System represents a clinically viable and innovative approach to maxillary molar distalization, combining the advantages of mini-implant anchorage with a strategically designed wire framework for controlled force delivery. While its efficacy has thus far been demonstrated

only on a simulated jaw model, the underlying biomechanics and simplicity of chairside fabrication offer significant promise for clinical application. Despite the absence of large-scale or in vivo studies, the system introduces a novel, minimally invasive solution that addresses key limitations of existing distalization methods. As such, it holds the potential to contribute meaningfully to the evolving landscape of skeletal anchorage techniques in orthodontics and merits further clinical investigation and validation.

5. Source of Funding

None.

6. Conflict of Interest

None.

References

1. Ceratti C, Serafin M, Del Fabbro M, Caprioglio A. Effectiveness of miniscrew-supported maxillary molar distalization according to temporary anchorage device features and appliance design: Systematic review and meta-analysis. *Angle Orthod.* 2024;94(1), 107–121. doi: 10.2319/052223-364.1.
2. Ghosh J, Nanda RS. Evaluation of an Intraoral Maxillary Molar Distalization Technique. *Am. J. Orthod. Dentofacial Orthop.* 1996; 110(6):639–46. doi: 10.1016/s0889-5406(96)80041-2
3. Sugawara J, Kanzaki R, Takahashi I, Nagasaka H, Nanda R. Distal movement of maxillary molars in nongrowing patients with the skeletal anchorage system. *Am J Orthod Dentofacial Orthop.* 2006;129(6):723–33. doi: 10.1016/j.ajodo.2005.08.036.
4. Serafin M, Fastuca R, Castellani E, Caprioglio A. Occlusal Plane Changes After Molar Distalization With a Pendulum Appliance in Growing Patients with Class II Malocclusion: A Retrospective Cephalometric Study. *Turk J Orthod.* 2021;34(1):10–17. doi: 10.5152/TurkJOrthod.2021.20050
5. Kim S, Lee NK, Park JH, K JH, Kim Y, Kook YA, et al. Treatment effects after maxillary total arch distalization using a modified C-palatal plate in patients with Class II malocclusion with sinus pneumatization. *Am J Orthod Dentofacial Orthop.* 2022;162(4):469–476. doi: 10.1016/j.ajodo.2021.04.033.
6. Guo R, Lam XY, Zhang L, Li W, Lin Y. Biomechanical analysis of miniscrew-assisted molar distalization with clear aligners: A three-dimensional finite element study. *Eur J Orthod.* 2024; 46(1):1–9 doi:10.1093/ejo/cjad077.
7. Cornelis MA, De Clerck HJ. Maxillary molar distalization with miniplates assessed on digital models: A prospective clinical trial. *Am J Orthod Dentofacial Orthop.* 2007;132(3):373–377.
8. Kircelli BH, Pektaş ZO, Kircelli C. Maxillary Molar Distalization with a Bone-Anchored Pendulum Appliance. *Angle Orthod.* 2006; 76(4):650–9.
9. Aebischer D, Serafin I, Bartusik-Aebischer D. Temporary skeletal anchorage devices and cone beam tomography in orthodontics—current application and new directions of development. *Appl. Sci.* 2024;14(12):1–19. doi: 10.3390/app14125028.
10. Campos CBA, Vilanova L, Alessio JLE, Miranda F, Garib D, Henriques JFC. Dentoskeletal effects of molar distalization with miniscrew-anchored cantilever and pendulum appliance for Class II correction. *Am J Orthod Dentofacial Orthop.* 2025;167(5):526–538. doi: 10.1016/j.ajodo.2024.11.011.

Cite this article: Kangane SK, Jadhav SR, Joshi YS, Maroore PS, Khandade DL, Bhangale RV. Suyamasi system: A mini implant supported system for molar distalization. *IP Indian J Orthod Dentofacial Res.* 2025;11(3):247–250.