International Journal of Community Medicine and Public Health
*Alhaqbani TS et al. Int J Community Med Public Health. 2025 Jul;12(7):3378-3382*
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20251769

**Review Article**

# Restorative approaches in hypodontia: clinical decision-making and treatment planning

**Tarfah Saleh Alhaqbani[1]*, Firas Mohamed Alsultan[2], Samer Masad Al-Johani[3], Wael Ibrahim Alzahrani[3], Ayed Mohammed Alshehri[4], Fayez Aied Alshehri[5], Abdulrahman Kamal Alkhayyal[6], Fahad Saeed Alqahtani[7], Rahma Mohammed Bahkali[8], Saeed Saleh Al Dossary[7]**

[1]Department of Dentistry, Alkharj Armed Forces Hospital, Alkharj, Saudi Arabia
[2]Department of Dentistry, Prince Sultan Military Hospital, Riyadh, Saudi Arabia
[3]Department of Dentistry, Medical Services-Ministry of the Interior, Riyadh, Saudi Arabia
[4]Department of Restorative Dentistry, Ministry of Defense, Riyadh, Saudi Arabia
[5]Department of Restorative Dentistry, Al Nakheel Medical Center, Riyadh, Saudi Arabia
[6]Security Forces Hospitals Program, General Directorate of Medical Services, Ministry of Interior, Riyadh, Saudi Arabia
[7]Department of Dentistry, Prince Abdulrahman Advanced Dental Institute, Riyadh, Saudi Arabia
[8]Department of Dentistry, National Guard Health Affairs, Jeddah, Saudi Arabia

**Received:** 25 May 2025
**Accepted:** 09 June 2025

***Correspondence:**
Dr. Tarfah Saleh Alhaqbani,
E-mail: Hagbanit@gmail.com



## ABSTRACT

Individuals with one or more missing teeth are referred to as having hypodontia. In practice, maintaining emotional balance, aesthetic appeal, and psychological well-being can be extremely stressful. Managing hypodontia requires a collaborative effort involving prosthodontists, orthodontists, periodontists, and restorative dentists. This review discusses evidence-based restorative approaches for managing hypodontia within a patient-centered framework. These include conservative bridgework, conventional fixed prostheses, removable partial dentures, and implant-borne restorations. The treatment of choice depends on the extent of hypodontia, occlusal relationships, available alveolar bone volume, and the patient's age. Orthodontic intervention is often necessary to achieve proper space distribution before definitive restoration and may also be required for interim prosthodontic rehabilitation. Digital advancements, such as computer-aided design, computer-assisted diagnosis, and 3D imaging, are critical in enhancing diagnostic precision, treatment planning, and prosthetic fabrication. Biological factors, including the integrity of periodontal tissues, occlusal forces, and long-term stability, are essential in determining the appropriate restorative approach. Additionally, patient-centered factors such as aesthetic expectations, treatment costs, and long-term maintenance play a decisive role in treatment selection. Modern approaches prioritize minimally invasive techniques and bioactive restorative materials to preserve tooth structure and improve outcomes. This review provides a structured protocol for managing hypodontia, emphasizing technological innovations, interdisciplinary collaboration, and patient-driven treatment planning. Advances in biomaterials, adhesive materials, and implant therapy continue to support clinical strategies for hypodontia, ensuring functional and aesthetically durable solutions.

**Keywords:** Restorative, Hypodontia, Clinical, Treatment planning, Missing teeth, Orthodontic

## INTRODUCTION

Hypodontia is considered a significant condition in restorative dentistry. Its prevalence is estimated to range widely, from approximately 1.6% to 6.9% of the population. While hypodontia is primarily a genetically influenced condition, environmental factors can also play a role. It frequently occurs in association with disorders such as ectodermal dysplasia. However, non-syndromic hypodontia is more commonly observed, with the maxillary lateral incisors and mandibular second premolars being the most frequently absent teeth.[1] The complexity of treatment planning increases with the number of missing teeth, requiring dentists to carefully evaluate occlusion, available space, and patient expectations. Hypodontia has far-reaching effects beyond missing teeth, contributing to developmental abnormalities of the dental arches, occlusal issues, and psychological distress due to compromised aesthetics.[2] Treatment is further complicated by spacing problems, tilted adjacent teeth, and supra-eruption of opposing teeth.[3] Close collaboration among pediatric dentists, orthodontists, prosthodontists, and oral and maxillofacial surgeons is essential in developing a coordinated, multidisciplinary treatment approach. The primary objective is to provide each patient with a functional, stable, and aesthetically pleasing solution tailored to their individual needs.[4] Factors such as age, severity, and pre-existing dental conditions significantly influence restorative treatment choices. Orthodontic intervention is often the first step when space redistribution is necessary. In cases where occlusal relationships are favorable, space closure may be performed. Alternatively, space can be preserved or created for future prosthetic rehabilitation, depending on patient age, bone maturation, and long-term stability. Fixed prosthodontic treatment options include resin-bonded bridges, conventional bridges, and implant-supported restorations.[5] Dental implants provide an effective long-term solution for replacing missing teeth in cases of hypodontia. However, implant placement may be limited by insufficient bone volume, particularly in severe cases of agenesis. Ridge augmentation techniques, such as guided bone regeneration and autologous grafting, may be necessary to prepare the implant site. Proper timing is crucial, as implants should be placed only after bone growth is complete to prevent infra-occlusion. For growing patients, interim prosthetic solutions such as removable partial dentures or bonded restorations help maintain aesthetics and function until definitive treatment can be performed. Implant therapy is only pursued when conventional prosthetic options are unsuitable or less viable.[6,7] Among fixed prosthetic options, resin-bonded bridges are the most commonly used in young patients due to their minimally invasive nature and ability to preserve surrounding tooth structure.[8] Conventional bridges offer greater durability but require extensive support, making them unsuitable in certain cases. Removable prosthodontics remains an effective treatment for hypodontia, particularly in situations where fixed solutions are constrained by budget, bone availability, or other factors. However, compliance and adaptability with removable prostheses can be challenging, especially in children.[8] Among fixed prosthetic options, resin-bonded bridges are the most commonly used in young patients due to their minimally invasive nature and ability to preserve surrounding tooth structure. Conventional bridges offer greater durability but require extensive support, making them unsuitable in certain cases. Removable prosthodontics remains an effective treatment for hypodontia, particularly in situations where fixed solutions are constrained by budget, bone availability, or other factors. However, compliance and adaptability with removable prostheses can be challenging, especially in children. In treatment planning, in addition to functional and structural considerations, patient expectations must be taken into account. Aesthetic concerns, particularly in the anterior region, often influence decision-making. Digital smile design and mock-up restorations have improved patient engagement by allowing them to visualize potential outcomes, thereby enhancing acceptance and satisfaction.[9] Long-term maintenance and follow-up are essential for the success of these treatments. Regular assessments are required to monitor the stability of prosthetic restorations and implants, while orthodontic retention is necessary to prevent relapse.

Additionally, patient education and motivation play a crucial role in ensuring the long-term success of restorative work.[10] Managing hypodontia requires complex restorations, meticulous treatment planning, and interdisciplinary collaboration. No single solution applies universally; instead, treatment must be individualized based on each patient's unique needs. Advances in biomaterials, digital workflows, and minimally invasive techniques continue to expand treatment possibilities.[4] Clinicians are increasingly adopting a patient-centered approach to decision-making, optimizing outcomes for individuals affected by hypodontia.[11]

## LITERATURE SEARCH

This narrative review is based on a comprehensive literature search conducted on March 12, 2025 in the Medline, Scopus, and Cochrane databases. Utilizing medical subject headings (MeSH) and relevant keywords, the search aimed to identify studies discussing restorative approaches in hypodontia, clinical decision-making, and treatment planning. To ensure thoroughness, a manual search was also conducted using Google Scholar, and the reference lists of identified papers were reviewed to locate additional relevant studies. The review focused on articles addressing the definition of hypodontia, the restorative approaches in hypodontia, clinical decision-making and treatment planning for hypodontia.

No restrictions were applied regarding publication date, language, participant age, or type of publication, ensuring a broad and inclusive exploration of the available literature.

## DISCUSSION

The congenital absence of one or more teeth is a life-changing condition that significantly impacts dental health, function, and aesthetics. Managing hypodontia requires a well-structured diagnosis and treatment plan to achieve optimal outcomes. The severity of hypodontia varies, ranging from the absence of a single tooth to multiple missing teeth, which can affect occlusion and jaw development and have profound psychological consequences. Treatment planning considers all available restorative and orthodontic options, with a multidisciplinary approach involving prosthodontics, orthodontics, periodontics, and oral surgery to ensure both functional and aesthetic success.[12] The discussion deals with some areas of clinical decision-making and treatment planning, including diagnosis, restorative options, considerations for orthodontics, and the need for a multidisciplinary approach.

### *Diagnosis and treatment planning*

A comprehensive clinical and radiographic assessment is essential for diagnosing hypodontia and formulating an appropriate treatment strategy. Clinical examination involves assessing the number, position, and morphology of missing teeth, occlusion, facial symmetry, and soft tissue anatomy. The severity of hypodontia is classified as mild (one to two missing teeth), moderate (three to five missing teeth), or severe (six or more missing teeth). Radiographic techniques, including panoramic projections, help evaluate missing, unerupted, or impacted teeth, root development, and alveolar bone structure. Cone-beam computed tomography (CBCT) is particularly valuable in assessing bone volume for implant placement and detecting impacted teeth.[13,14] Cephalometric analysis is crucial in cases requiring orthodontic or orthognathic intervention. These diagnostic methods assist in determining whether space should be maintained for future prosthetic replacement or closed using orthodontic therapy.[15]

Skeletal growth considerations are fundamental when planning treatment for children and adolescents with hypodontia. Facial height and jaw relationships can be altered due to tooth agenesis, necessitating early intervention to guide normal maxillofacial development. Dental implants should only be placed after skeletal maturity to prevent infra-occlusion and compromised adjacent bone growth. Early orthodontic or prosthetic intervention can help manage growth-related complications and prepare for future restorations.[16]

Treatment goals must align with the patient's functional and aesthetic needs. Restorative objectives include facilitating occlusion and mastication by maintaining proper occlusal contacts, preventing temporomandibular joint (TMJ) dysfunction, and ensuring consistency with facial aesthetics by achieving restorations that blend seamlessly with the natural dentition.[17,18] Long-term stability is another priority, necessitating durable restorative materials and techniques that minimize the risk of relapse or prosthetic failure.[19]

### *Restorative options for hypodontia*

Direct restorations, such as composite resin bonding, offer a conservative and cost-effective approach to closing small anterior gaps in mild cases of hypodontia. This technique involves modifying adjacent teeth or adding composite material to mimic natural anatomy. While minimally invasive and aesthetically effective, composite restorations are prone to discoloration, wear, and debonding over time, requiring regular maintenance.[20,21]

Removable prostheses provide a viable option, particularly for children and adolescents who are not yet candidates for fixed restorations or implants. Acrylic-based partial dentures are inexpensive and easily adjustable but can cause discomfort and require frequent replacement. Flexible partial dentures offer better aesthetics and comfort but are associated with plaque accumulation and potential periodontal health issues. Periodic assessment and modification of removable prostheses are essential due to ongoing changes in occlusion and skeletal growth.[22]

Fixed prosthetic solutions offer a more stable and aesthetic alternative for hypodontia management. Resin-bonded bridges (RBBs) are a preferred option for younger patients due to their minimal tooth preparation requirements. Although highly aesthetic, they are susceptible to debonding under high occlusal forces. Conventional fixed partial dentures, which involve preparing abutment teeth to support crowns, provide superior functional stability and longevity but require significant tooth reduction, increasing the risk of secondary caries and loss of abutment vitality.[23]

Dental implants provide a long-term restorative solution for hypodontia, but their success depends on careful planning. Implant placement should be delayed until skeletal growth is complete, typically around age 18 in females and 21 in males, to prevent infra-occlusion.[24] A common challenge in hypodontia patients is insufficient alveolar bone, necessitating bone grafting or ridge augmentation before implant placement. When implants are not feasible, alternative treatments such as orthodontic space closure or premolar auto-transplantation may be considered. In cases of severe alveolar deficiency, guided bone regeneration (GBR) or distraction osteogenesis can help create a suitable site for implant placement.[24,25]

### *Orthodontic considerations in restorative planning*

Managing edentulous spaces is a critical aspect of hypodontia treatment. The decision to close or maintain a space depends on occlusal relationships and aesthetic considerations. Space closure is preferable for mild

hypodontia cases where adjacent teeth can be modified to resemble the missing counterpart. Alternatively, space maintenance is necessary when the missing tooth plays a crucial role in occlusion or aesthetics. This approach requires careful planning to ensure proper alignment of future prosthetic restorations. Temporary solutions such as retainers with prosthetic teeth or interim restorations help preserve function and aesthetics during treatment.[26]

Effective coordination between orthodontic and restorative interventions is crucial in optimizing pre-prosthetic tooth positioning. Orthodontic treatment must be carefully timed with restorative planning to ensure proper space management, achieve favorable occlusion, and facilitate the successful placement of fixed prostheses or implants. Interdisciplinary collaboration ensures that adjacent teeth are positioned correctly, gaps are closed or maintained as needed, and occlusal relationships are optimized.[26]

Retention strategies are essential following orthodontic space closure to prevent relapse. Removable retainers with prosthetic teeth can maintain aesthetics and prevent unwanted tooth movement. Fixed retainers, particularly bonded lingual retainers, help preserve space closure in anterior regions. Where space is maintained for future prosthetic treatment, bonded pontics provide a temporary functional and aesthetic solution.[27]

### *Multidisciplinary approach to hypodontia management*

Successful hypodontia management requires a coordinated effort among prosthodontists, orthodontists, periodontists, and oral surgeons. Prosthodontists develop restorations that ensure occlusal stability and aesthetic integration, while orthodontists manage space and tooth alignment to facilitate optimal prosthetic placement. Periodontists enhance soft tissue and bone support for restorations, and oral surgeons perform implant placement, bone grafting, and other necessary surgical procedures.[12]

Beyond physical restoration, addressing the psychological impact of hypodontia is crucial. Adolescents, in particular, may experience low self-esteem due to missing anterior teeth. Effective communication, emotional support, and shared decision-making enhance patient adherence to treatment and overall satisfaction.[28]

Long-term maintenance and preventive care are essential for ensuring the durability of prosthetic restorations. Regular follow-up assessments should include evaluations of restoration stability, periodontal health, and occlusal function. Monitoring bone levels around implants is critical, while meticulous oral hygiene is necessary to prevent prosthetic complications. A multidisciplinary approach optimizes both functional and aesthetic treatment outcomes, ensuring long-term success.[29,30]

## CONCLUSION

Hypodontia should be managed through a multidisciplinary approach to achieve the best functional and aesthetic results. Treatment plans should consider patient age, the severity of tooth agenesis, occlusal relationships, and long-term stability. Orthodontic intervention is often essential for achieving proper space distribution, while prosthetic options such as adhesive bridges, implants, and removable prostheses should be selected based on biological and patient-specific factors. Advances in digital dentistry, adhesive technology, and new materials have enabled the development of more conservative and durable restorative treatment modalities. The success of therapy also requires long-term follow-up and patient education. By incorporating evidence-based methods with technological innovations, clinicians can provide predictable, patient-satisfying, and long-term restorative solutions for hypodontia.

*Funding: No funding sources*
*Conflict of interest: None declared*
*Ethical approval: Not required*

## REFERENCES

1. Al-Ani AH, Antoun JS, Thomson WM, Merriman TR, Farella M. Hypodontia: An Update on Its Etiology, Classification, and Clinical Management. BioMed Res Int. 2017;2017:9378325.
2. Laing E, Cunningham S, Jones S, Moles D, Gill D. Psychosocial impact of hypodontia in children. Am J Orthodont Dentofacial Orthop. 2010;137:35-41.
3. Management of the Developing Dentition and Occlusion in Pediatric Dentistry. American Academy of Pediatric Dentistry. 2024.
4. Gill D, Barker C. The multidisciplinary management of hypodontia: A team approach. Brit Dental J. 2015;218(3):143-9.
5. Jayawardena DS, Ahmed R, Watts J, Cunliffe J, Darcey J. Considerations for restorative dentistry secondary care referrals - part 1: defining strategic importance. Brit Dental J. 2022;233(1):27-34.
6. Corsalini M, Barile G, Ranieri F, Edvige M, Tommaso C, Saverio C, et al. Comparison between Conventional and Digital Workflow in Implant Prosthetic Rehabilitation: A Randomized Controlled Trial. J Functional Biomaterials. 2024;15(6):149.
7. Attia S, Schaaf H, El Khassawna T, Malhan D, Mausbach K, Hans-Peter H, et al. Oral Rehabilitation of Hypodontia Patients Using an Endosseous Dental Implant: Functional and Aesthetic Results. J Clin Med. 2019;8(10):1687.
8. Rathee M, Alam M, Divakar S, Malik S. Resin-bonded bridge as a simplified approach to restore missing teeth in esthetic zone by conventional and digital techniques. Dental Res J. 2022;19:92.
9. Garcia P, Costa R, Calgaro M, Ritter AV, Correr GM, Da Cunha LF, et al. Digital smile design and mock-up technique for esthetic treatment planning

with porcelain laminate veneers. J Conservative Dentistr. 2018;21(4):455-8.
10. Garbo D, Baima G, Mariani GM, Romano F, Aimetti M. Orthodontic treatment in stage IV periodontitis patients: Timing, management and long-term prognosis. Sem Orthodont. 2024;30(2):113-22.
11. Jepson N, Nohl F, Carter N. The interdisciplinary management of hypodontia: Restorative dentistry. Brit Dental J. 2003;194(6):299-304.
12. Valle AL, Lorenzoni FC, Martins LM, do Valle CVM, Henriques JFC, de Almeida ALPF, et al. A multidisciplinary approach for the management of hypodontia: case report. J Applied Oral Sci. 2011;19(5):544-8.
13. Barber S, Bekker H, Meads D, Pavitt S, Khambay B. Identification and appraisal of the outcome measures used to evaluate hypodontia care: A systematic review. Am J Orthodont Dentofacial Orthoped. 2017;153(2):184-94.
14. Alshomrani F. Cone-Beam Computed Tomography (CBCT)-Based Diagnosis of Dental Bone Defects. Diagnostics. 2024;14(13):1404.
15. Rawat SS, Jadhav VV, Paul P. A Comparative Analysis of Skeletal and Dental Parameters in Bilateral Cleft Lip and Palate vs. Non-bilateral Cleft Lip and Palate Patients in the Central Indian Population: A NemoCeph Study. Cureus. 2024;16(2):e54497.
16. Rakhshan V. Congenitally missing teeth (hypodontia): A review of the literature concerning the etiology, prevalence, risk factors, patterns and treatment. Dental Res J. 2015;12(1):1-13.
17. Dimitroulis G. Management of temporomandibular joint disorders: A surgeon's perspective. Australian Dental J. 2018;63(S1):S79-90.
18. Fondriest J. Shade matching in restorative dentistry: The science and strategies. Int J Periodont Restorat Dentistr. 2003;23:467-79.
19. Lolos D, Mihali SG, Dinu S, Mitariu M, Tudor A, Oancea R. Retrospective Long-Term Survival Rate and Clinical Performance of Zirconium Oxide Restorations over the Past 5 Years: A Comparative Study Between Single Crowns and Fixed Dental Prostheses. Medicina. 2025;61(2):61(2):210.
20. Pace-Balzan A, Chatzipantelis A, Charan G, Dunn KJ, Charan G, Ashley MP. Restorative dentistry clinical decision-making for hypodontia: complex cases. Br Dent J. 2023;235(7):489-95.
21. King S, Sood B, Ashley MP. Practical advice for successful clinical treatment with resin-bonded bridges. Br Dent J. 2023;235(7):503-9.
22. Akinyamoju CA, Ogunrinde TJ, Taiwo JO, Dosumu OO. Comparison of patient satisfaction with acrylic and flexible partial dentures. Niger Postgraduate Med J. 2017;24(3):143-9.
23. Gulati J, Tabiat-Pour S, Watkins S, Banerjee A. Resin-Bonded Bridges-the Problem or the Solution? Part 1- Assessment and Design. Dental Update. 2016;43:506-21.
24. Henry P. Tooth loss and implant replacement. Aust Dental J. 2000;45:150-72.
25. Kumar VV, Ebenezer S, Thor A. Bone Augmentation Procedures in Implantology. In: Bonanthaya K, Panneerselvam E, Manuel S, Kumar VV, Rai A, eds. Oral and Maxillofacial Surgery for the Clinician. Singapore: Springer Nature Singapore. 2021;407-26.
26. Naoum S, Allan Z, Yeap CK, Razza JM, Murray K, Turlach B, et al. Trends in orthodontic management strategies for patients with congenitally missing lateral incisors and premolars. Angle Orthodont. 2021;91(4):477-83.
27. Lyros I, Tsolakis I, Maroulakos M, Fora E, Lykogeorgos T, Dalampira M, et al. Orthodontic Retainers-A Critical Review. Children. 2023;10(2):230.
28. Kudsi Z, Fenlon MR, Johal A, Baysan A. Assessment of Psychological Disturbance in Patients with Tooth Loss: A Systematic Review of Assessment Tools. J Prosthodont. 2020;29(3):193-200.
29. Kwon T, Lamster IB, Levin L. Current Concepts in the Management of Periodontitis. Int Dental J. 2021;71(6):462-76.
30. Doornewaard R, Glibert M, Matthys C, Vervaeke S, Bronkhorst E, de Bruyn H. Improvement of Quality of Life with Implant-Supported Mandibular Overdentures and the Effect of Implant Type and Surgical Procedure on Bone and Soft Tissue Stability: A Three-Year Prospective Split-Mouth Trial. J Clin Med. 2019;8(6):773.

**Cite this article as:** Alhaqbani TS, Alsultan FM, Al-Johani SM, Alzahrani WI, Alshehri AM, Alshehri FA, et al. Restorative approaches in hypodontia: clinical decision-making and treatment planning. Int J Community Med Public Health 2025;12:3378-82.