

Commentary on mini dental implant insertions in children with ectodermal dysplasia

Funda Göker¹, Çiğdem Elbek Çubukçu²

¹Department of Biomedical, Surgical and Dental Sciences, University of Milano, Milan, Italy

²Department of Pedodontics, Faculty of Dentistry, Uludağ University, Bursa, Türkiye

Cite this article as: Göker F, Elbek Çubukçu Ç. Commentary on mini dental implant insertions in children with ectodermal dysplasia. *J Health Sci Med.* 2024;7(2):244-246.

Received: 18.01.2024

Accepted: 10.03.2024

Published: 25.03.2024

ABSTRACT

Dental implant insertions in children raises significant concerns related to both ethical and medical aspects. On the other hand, some children suffer from several problems such as hypodontia/anodontia and malformations of teeth due to severe conditions like ectodermal dysplasia. In such cases, mini dental implants can be a promising option in enhancing the overall quality of life with positive impact on oral function. However, there are several concerns such as growth disturbances of the jaws since oral implants are considered to behave similarly to ankylosed teeth and become submerged due to the growth process associated with continued eruption of adjacent natural teeth. Currently, there is a lack of clinical research and systematic review articles in literature that evaluates and compares the outcomes, risks, and advantages of mini dental implant insertions in children with syndromes such as ectodermal dysplasia.

Keywords: Mini dental implant, ectodermal dysplasia, dental implants, growing patients

Dear Editor,

The article “Dental implants in growing patients: a systematic review” by Bohner et al.¹ presents to the readers valuable information about the protocols and clinical outcomes of dental implant placements in growing individuals. However, this report represents some limitations such as there is no evaluation on outcomes of mini dental implant (MDI) insertions in children with syndromes such as ectodermal dysplasia (ED).

The article explains the concerns about inserting implants in children and aims to search the answers for possible complications and most suitable protocols for such rehabilitations. In this review, 2133 studies were screened, and 28 studies were included. Their findings report the results of 493 dental implants placed in children between 3-18 years old with a follow up period of 1 to 20 years.¹ The most common disorders for these rehabilitations included ED and dental trauma patients. The main complications for single restorations were infra-occlusion for maxilla and rotation of the implant-supported prosthesis for mandible. The survival rate was found to be over 85%, however this finding was lower than the results reported for adult patients.¹

Inserting implants in children raises significant concerns related to both ethical and medical aspects. Ethically, there is apprehension about the ability of children to provide informed consent, as they may lack the maturity to fully comprehend the implications of such procedures. Additionally, questions arise about the long-term impact on a child's autonomy when decisions are made for them at an early age.² Concerns include potential interference with normal growth and development, as well as the risk of complications that may arise as the child matures. Balancing the benefits of the implant against these potential risks is a critical aspect of ethical decision-making. Furthermore, the durability and adaptability of implants over a child's lifespan are major and most significant concerns.

On the other hand, some children suffer from several problems such as hypodontia/anodontia and malformations of teeth due to severe conditions like ED. ED is a genetic disorder affecting the development of ectodermal tissues, including teeth.³⁻⁷ This condition often results in missing or malformed teeth, posing significant functional and aesthetic concerns.³⁻⁵ In addition to the physical aspects, ED can have social and psychological implications.⁸ Traditionally, the

Corresponding Author: Funda GÖKER, funda.goker@unimi.it



This work is licensed under a Creative Commons Attribution 4.0 International License.

management of such children is achieved by conservative means. However, all these methods of treatment are not satisfactory and represent some concerns. MDIs play a crucial role in addressing the dental challenges faced by with ED.^{3,9,10} MDIs emerge as a viable solution, offering a minimally invasive and effective means to improve oral function, facial aesthetics, and overall quality of life for these children.^{3,11,12} The reduced size of MDIs minimizes the need for extensive surgical procedures, making the implantation process less invasive and more suitable for children.^{11,13}

MDIs are designed to provide stability for dental prosthetics, such as dentures or crowns, offering improved masticatory function. In ED cases, where tooth development is often compromised, MDIs become essential anchors for dental restorations, facilitating proper chewing and speech development.^{10,11} This not only enhances the child's nutritional intake but also contributes to their social well-being by promoting confident communication and interaction. Moreover, the placement of MDIs is generally quicker and less complex than traditional implants, making it a more manageable option for both the young patients and their caregivers. Reduced surgery time and discomfort contribute to a more positive experience for the child, fostering cooperation and compliance with necessary dental treatments.^{10,11} While MDIs offer significant benefits, it is essential to consider the longevity and durability of these implants. Regular follow-up appointments with a dental professional are crucial to monitor the stability of the MDIs and address any potential complications promptly. Additionally, ongoing advancements in dental implant technology may further enhance the efficacy of MDIs, ensuring optimal outcomes for children with ED. Due to considerations for jaw development prior to termination of growth, implant placement in the anterior mandible at the symphyseal region should be decided with caution.

According to the results of the article by Bohner et al.¹ oral rehabilitation in children using implant-supported prosthesis is not very common all over the world, furthermore, reported follow up periods are very short to reach a conclusion. Furthermore, in this report, the results of MDI were not evaluated. There is a similar report in literature by Chrcanovic et al.³ about dental implants in patients (including adults and growing patients) with ED that report 1472 implants (1392 conventional, 47 zygomatic, 33 MDI) with 24.6% of implants placed in children.³ There are several concerns explained in literature such as growth disturbances of the jaws since osseointegrated implants are considered to behave similarly to ankylosed teeth and become submerged due to the growth process associated with continued eruption of adjacent natural teeth. However,

some researchers report some advantages for ED patients due to physiological conservation of bone tissue, since after adolescence, severe bone resorption can be a major challenge for implant insertion in edentulous ED patient.¹⁰ The design and type of implant system used in pediatric patients is also responsible for successful treatment outcome. Successful dental implant treatment in children can only be achieved by a multidisciplinary approach in their treatment plan.

CONCLUSION

The report by Bohner et al.¹ highlights some advantages and minor risks of dental implants in children. However, there is still a lack of clinical research and systematic review articles in literature that evaluates the outcomes of implant and MDI insertions specially in children with ED. We think that MDI is a promising option in enhancing the overall quality of life for young ED patients, due to their minimally invasive nature, improved stability, and positive impact on oral function. The status of skeletal growth, the degree of hypodontia, status of existing teeth and psychological state of each ED patient should be analyzed with caution to determine the optimal timing for implant and/or MDI insertion. Further studies should be conducted with larger sizes of samples, with longer follow up periods and with comparison of advantages, disadvantages, and complications. Currently, it is not possible to reach a recommendation on this topic since there is no clear evidence that shows MDIs can be inserted in children with ED. The objective of this work was not suggesting clinicians to insert MDIs in children with ED. Each child should be evaluated with caution as an individual case with multidisciplinary approach in their treatment plan, and possible risks and complications should be assessed with great attention. In literature more research and clinical experience are needed to reach a decision for recommendations as guidelines for insertion of MDI insertions in growing individuals with ED.

ETHICAL DECLARATIONS

Referee Evaluation Process

Externally peer reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

REFERENCES

1. Bohner L, Hanisch M, Kleinheinz J, Jung S. Dental implants in growing patients: a systematic review. *Br J Oral Maxillofac Surg.* 2019;57(5):397-406. doi: 10.1016/j.bjoms.2019.04.011
2. Agarwal N, Kumar D, Anand A, Bahetwar SK. Dental implants in children: a multidisciplinary perspective for long-term success. *Natl J Maxillofac Surg.* 2016;7(2):122-126. doi: 10.4103/0975-5950.201362.
3. Chrcanovic BR. Dental implants in patients with ectodermal dysplasia: a systematic review. *J Craniomaxillofac Surg.* 2018;46(8):1211-1217. doi: 10.1016/j.jcms.2018.05.038
4. Itin PH, Fistarol SK. Ectodermal dysplasias. *Am J Med Genet Part C Semin Med Genet.* 2004;131(1):45-51. doi: 10.1002/ajmg.c.30033.
5. Itin PH. Etiology and pathogenesis of ectodermal dysplasias. *Am J Med Genet Part A.* 2014;164(10):2472-2477. doi: 10.1002/ajmg.a.36550
6. Itin PH. Ectodermal dysplasia: thoughts and practical concepts concerning disease classification - the role of functional pathways in the molecular genetic diagnosis. *Dermatol.* 2013;226(2):111-114. doi: 10.1159/000346613
7. Deshpande SN, Kumar V. Ectodermal dysplasia - maxillary and mandibular alveolar reconstruction with dental rehabilitation: a case report and review of the literature. *Indian J Plast Surg.* 2010;43(1):92-96. doi: 10.4103/0970-0358.63969
8. Hanisch M, Sielker S, Jung S, Kleinheinz J, Bohner L. Self-assessment of oral health-related quality of life in people with ectodermal dysplasia in Germany. *Int J Environ Res Public Health.* 2019;16(11):1933. doi: 10.3390/ijerph16111933
9. Kramer FJ, Baethge C, Tschernitschek H. Implants in children with ectodermal dysplasia: a case report and literature review. *Clin Oral Implants Res.* 2007;18(1):140-146. doi: 10.1111/j.1600-0501.2006.01180.x
10. Kilic S, Altintas SH, Yilmaz Altintas N, et al. Six-year survival of a mini dental implant-retained overdenture in a child with ectodermal dysplasia. *J Prosthodont.* 2017;26(1):70-74. doi: 10.1111/jopr.12366
11. Mello BZ, Silva TC, Rios D, Machado MA, Valarelli FP, Oliveira TM. Mini-implants: alternative for oral rehabilitation of a child with ectodermal dysplasia. *Braz Dent J.* 2015;26(1):75-78. doi: 10.1590/0103-6440201300111
12. Sweeney IP, Ferguson JW, Heggie AA, Lucas JO. Treatment outcomes for adolescent ectodermal dysplasia patients treated with dental implants. *Int J Paediatr Dent.* 2005;15(4):241-248. doi: 10.1111/j.1365-263X.2005.00610.x
13. Aydinbelge M, Gumus HO, Sekerci AE, Demetoglu U, Etoz OA. Implants in children with hypohidrotic ectodermal dysplasia: an alternative approach to esthetic management: case report and review of the literature. *Pediatr Dent.* 2013;35(5):441-446.