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CASE REPORT

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Persistent oronasal communication closure in a patient with cleft lip and palate: A case report

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Introduction: Cleft lip and palate (CLP) is a common congenital defect in the craniofacial region, requiring multidisciplinary treatment and multiple surgeries. Primary and secondary alveoloplasties are performed in childhood and pre-adolescence, respectively, with tertiary alveoloplasty at growth's end for dental rehabilitation. Oronasal fistulas are a complication post-alveoloplasty, influenced by various factors like patient age, cleft type, surgical experience, and postoperative infections. **Case Report:** This paper presents a case of tertiary alveoloplasty using an autologous chin graft in a 52-year-old male with a history of CLP, diabetes, smoking, and previous unsuccessful surgeries. The surgery involved resecting the fistula, reconstructing the nasal floor and alveolar ridge with grafts, and achieving tension-free closure. Postoperative results showed significant bone regeneration and successful reconstruction. The case highlights the challenges in oral rehabilitation of CLP patients, considering factors like scar tissue, systemic health, and implant integration difficulties. **Conclusions:** The choice of a chin graft offered advan- tages over iliac crest grafts, with lower morbidity and higher success. The patient's sys- temic conditions led to the decision to use a fixed plural dental prosthesis (FPP) instead of further implants. This emphasizes the need for comprehensive patient evaluation and a multidisciplinary approach in treatment planning.

PALABRAS CLAVE

Cleft lip, cleft palate, alveoloplasty, bone transplantation, alveolar bone grafting

1 | INTRODUCTION

Cleft lip and palate (CLP) is the most common congenital defect affecting the craniofacial region, with an annual prevalence of 10 in 10,000 live births [1, 2]. It arises from an alteration in the fusion of the facial processes during embryonic development, leading to an incomplete fusion of the lip and/or palate. Its treatment requires a multidisciplinary team and surgeries from the early stages. Primary alveoloplasty is performed in childhood, often coinciding with lip repair. Secondary alveoloplasty is conducted later, around ages 8-12, primarily to provide bone support for tooth eruption, frequently using iliac crest grafts. At the end of growth, tertiary alveoloplasty can be considered to refine the alveolus or prepare it for dental rehabilitation, such as implant placement. Rehabilitating the edentulous space is crucial [2], affecting the patient's function, aesthetics, and quality of life [3]. An oronasal fistula is a complication that can arise after alveoloplasty in CLP patients and causes functional alterations, impacting their quality of life. Its etiology is attributed to various factors: patient's age at the surgical procedure, extent and type of cleft, associated syndromes, surgeon's experience, tension at the repair site, and postoperative infections[4]. The authors present a case of tertiary alveoloplasty for the closure of a persistent oronasal communication in a cleft patient using an autologous chin graft, aiming to optimize outcomes and offer a novel solution to the challenges associated with oronasal communications.

2 | CASE REPORT

A 52-year-old male patient with a history of insulin-requiring type 2 Diabetes Mellitus with poor metabolic control (HbA1c = 7.1%), chronic smoking habit (PAI = 10), and a cleft lip and palate surgically treated at birth was referred to our centre due to a persistent oronasal communication. Before being treated by our team, the patient experienced the failure of a dental implant placed in the cleft area. Additionally, he underwent three reconstruction surgeries with particulate bone grafts that failed to close the fistula successfully. Preoperatively, the patient underwent smoke-cessation counseling, aswell as medical management of his underlying medical conditions

The surgical management involved resecting the fistulous tract to the nasal cavity.

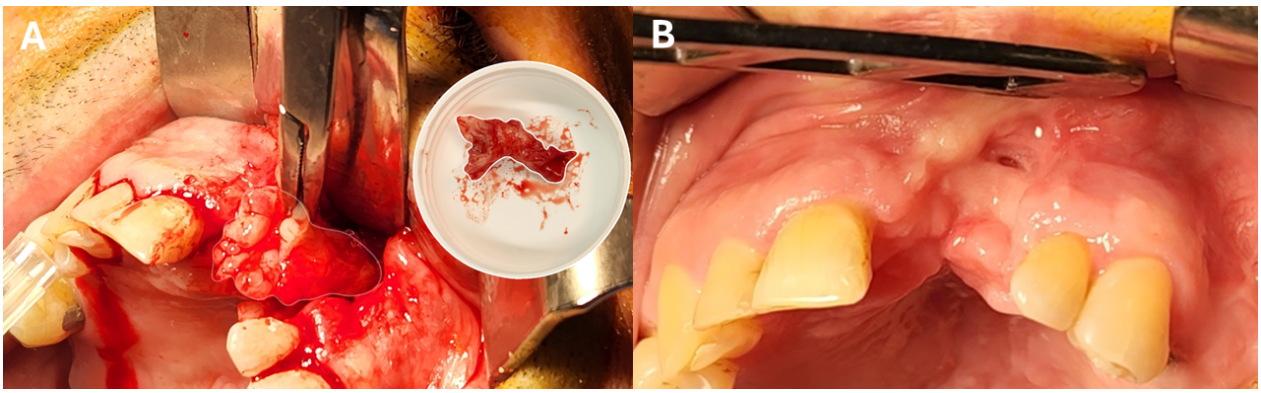

FIGURE 1 Resection of the oronasal fistula. (A) A crevicular vestibular incision is made with distal relief on both sides of the oronasal communication. Dissection of the vestibular and palatal mucoperiosteal flap. (B) Excision of scar tissue and old bone graft.

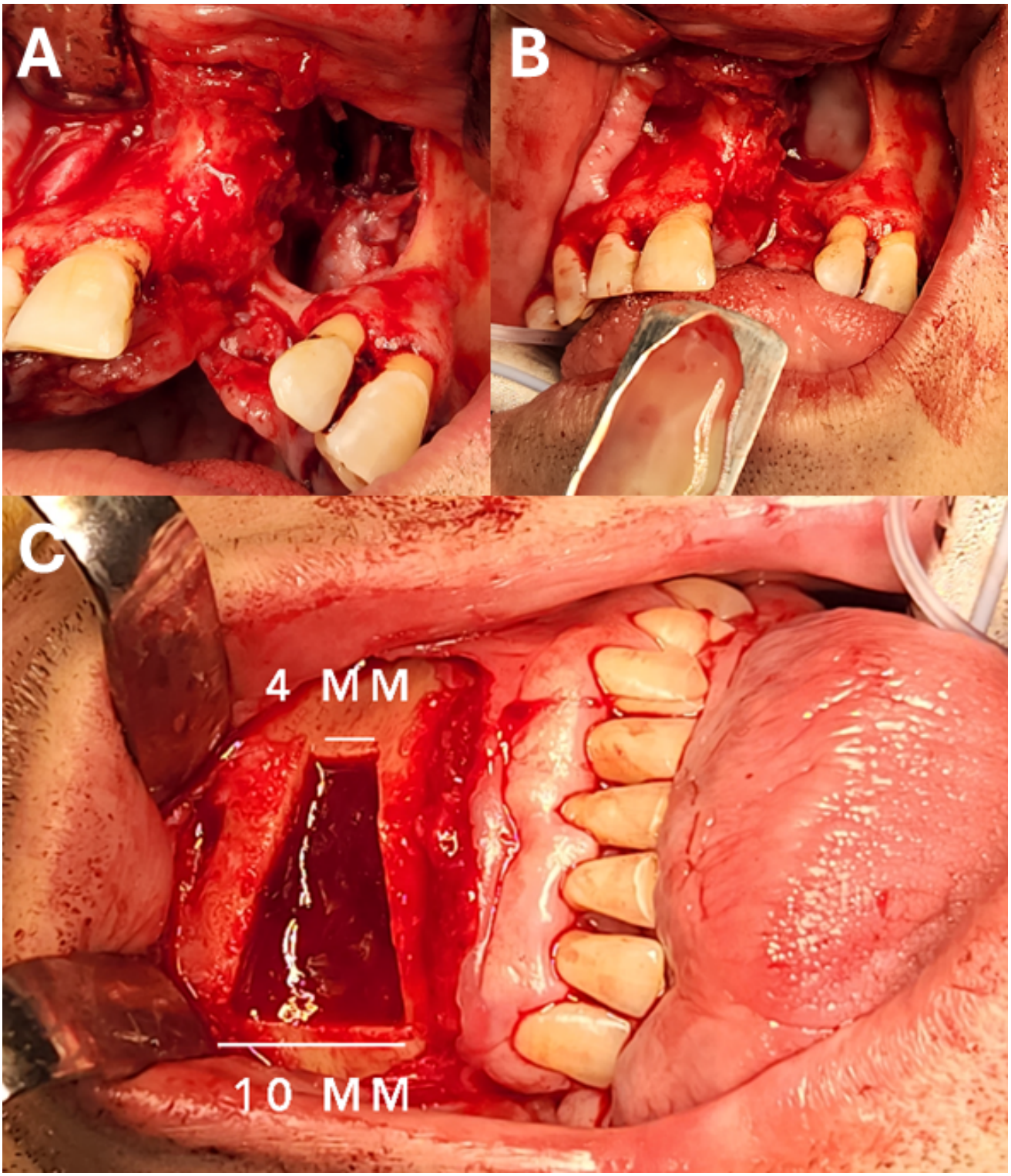

FIGURE 2 (A) Mucosa of the floor of the nasal cavity, lateral and medial walls are identified using blunt dissection. (B) Nasal mucosa closure with PRF membranes. (C) Osteotomy using piezo electric and removal of wedge-shaped cortical from the mandibular symphysis.

A mucoperiosteal vestibular flap was released, and the remaining nasal floor mucosa was elevated and sutured, followed by the placement of PRF (platelet-rich fibrin) membranes. The nasal floor and the alveolar ridge reconstruction were achieved using an autologous cortical graft from the chin and cortico-cancellous allograft, respectively. Bone graft was stabilized to the defect by compression, achieving adequate stability. The mucosal flaps were mobilized and sutured, achieving a primary tension-free clousure.

Six moths post-op CT scan showed significant bone regeneration of the alveolar bone and an adequate reconstruction of the nasal floor. Finally, the patient was rehabilitated with a fixed plural dental prosthesis (FPP).

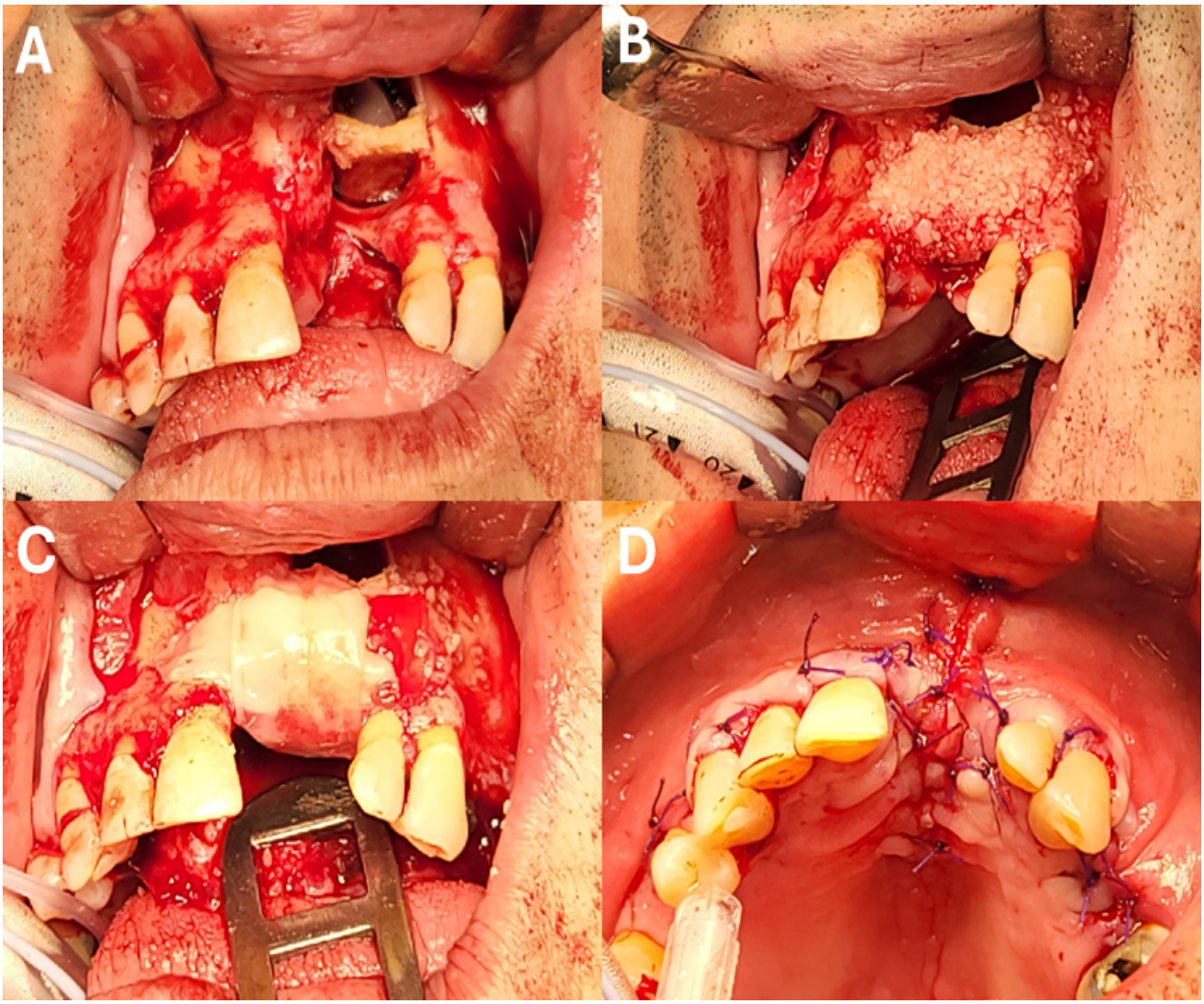

FIGURE 3 (A) Mandibular cortical bone used as a graft for the floor of the left nasal cavity. (B) Particulate corticomedullary bone graft is placed, covering the cortical graft until filling the alveolar ridge. (C) Placement of PRF membranes. (D) Flap advancement and closure.

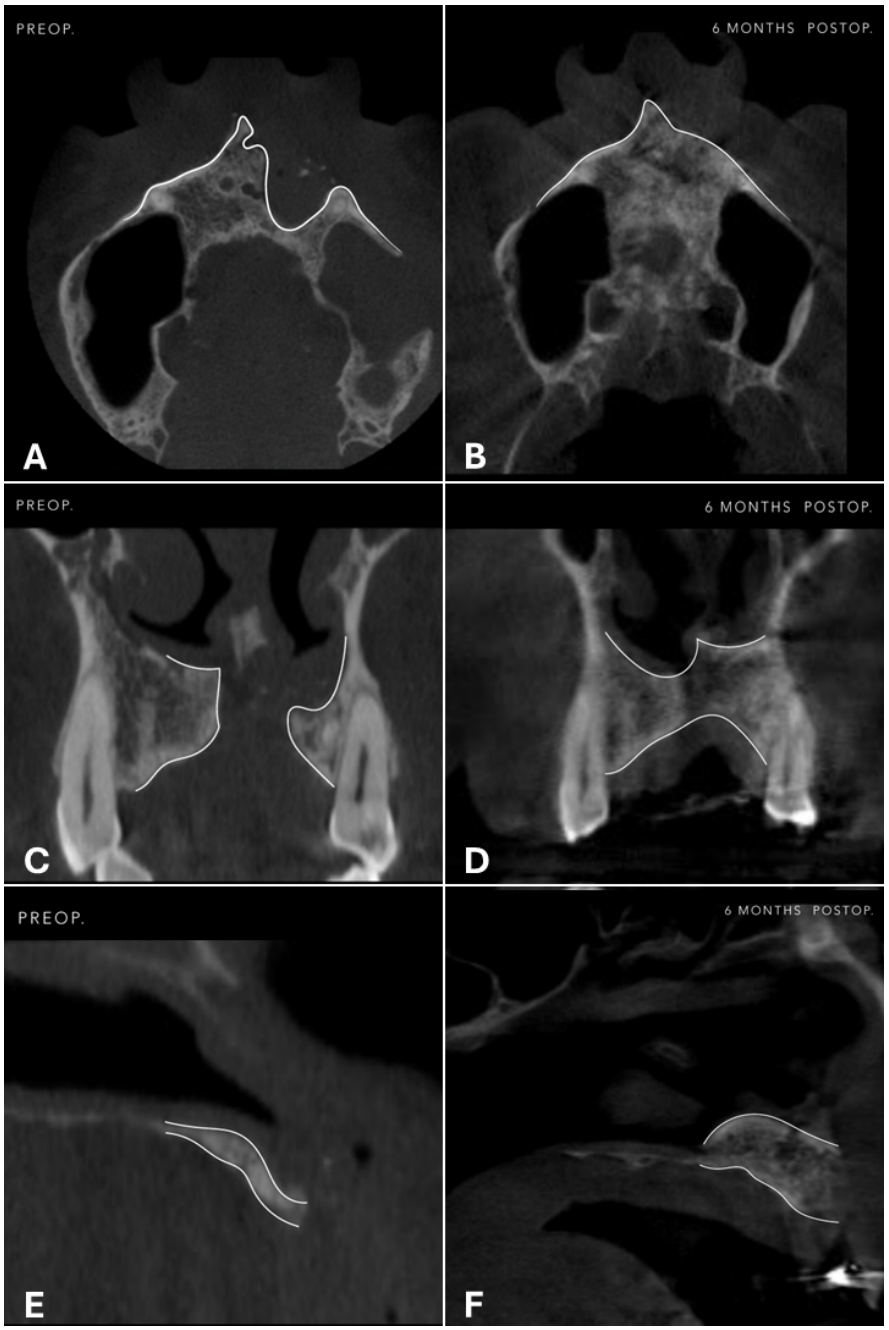

FIGURE 4 (A) Axial preoperative cone-beam computed tomography showing total bone loss at the affected site, directly related to the oronasal communication. (B) Axial tomography at 6 months follow-up, showing significant bone regeneration in both height and width of the alveolar bone and proper reconstruction of the nasal floor. (C) Sagittal preoperative cone-beam computed tomography showing total bone loss at the affected site, directly related to the oronasal communication. (D) Sagittal tomography at 6 months follow-up, showing significant bone regeneration in both height and width of the alveolar bone and proper reconstruction of the nasal floor. (E) Coronal preoperative cone-beam computed tomography showing total bone loss at the affected site, directly related to the oronasal communication. (F) Coronal tomography at 6 months follow-up, showing significant bone regeneration in both height and width of the alveolar bone and proper reconstruction of the nasal floor.

3 | DISCUSSION

The failure of previous surgical procedures in this patient can be attributed to several interrelated factors, including systemic health conditions, local anatomical challenges, and lifestyle habits [5, 6]. The surgical techniques used in previous attempts, while standard, may not have been optimal given the patient's unique challenges. The utilization of particulate bone grafts, although common, may not have provided the necessary stability and vascular support required in this complex case. The patient's uncontrolled diabetes significantly impacted wound healing and the immune response. Diabetes is known to impair the body's ability to repair tissues effectively, leading to delayed healing and increased susceptibility to infections[6]. This systemic condition likely contributed to the unsuccessful outcomes of the initial surgeries, as adequate healing is crucial for the integration and stability of bone grafts and other reconstructive efforts. The patient's chronic smoking habit (PAI = 10) introduces another layer of complexity. Smoking adversely affects vascular supply and tissue oxygenation, both of which are essential for proper healing and graft integration. The negative impact of smoking on bone metabolism and immune function further compounds the difficulty of achieving successful surgical outcomes in this patient [5]. Recognizing the detrimental effects of smoking on wound healing and the risk of complications, we implemented a targeted smoking cessation program four weeks prior to the surgery. However, despite our efforts and the initial success in cessation, the patient resumed smoking at a lower rate following the initial healing period. This relapse highlights the persistent challenge of maintaining long-term smoking cessation in patients with complex surgical histories and systemic health issues. Continued smoking, even at a reduced level, can still impede full recovery and increase the risk of complications, particularly in such delicate reconstructive surgeries. This case illustrates the challenges associated with the oral rehabilitation of patients with a history of cleft lip and palate and its complications. In this scenario, the most significant factor to consider was the amount of scar tissue and altered anatomy of the surgical site due to multiple interventions, such as cleft surgery, tooth extraction, implants, and unsuccessful bone graft attempts to close the defect. Implant placement in areas previously affected by clefts and other interventions is inherently more challenging as it predisposes to decreased vascular supply in the area, thus reducing the likelihood of implant osseointegration success. Additionally, in this case, there are two systemic factors to consider: firstly, the presence of uncontrolled diabetes mellitus that negatively impacts healing and immune response. Secondly, the patient's chronic smoking habit reduces blood flow in tissues and jeopardizes implant osseointegration. These three factors could have significantly contributed to the reconstruction and implant attempts failure in this patient [5, 6]. Chin graft was chosen as the donor site due to its low morbidity and high success rate, providing sufficient bone volume, shorter surgical and hospital time, pain, and minimal intraoral scarring, unlike the use of the iliac crest, which causes greater symptomatology, limits mobility, and results in a longer recovery. The chin graft for this case offers certain advantages over the iliac crest graft; the cortical bone of the jaw has a smaller vascular surface proportion relative to the bone volume, and therefore, less vascular porosity and greater bone density, with a tendency towards less resorption. Moreover, the bone of the symphysis exhibits membranous ossification and has an embryological origin from the neural crest [7, 8]. While there is a high survival rate for dental implants placed in areas of bone grafts in patients with alveolar clefts, there are also difficulties with osseointegration. When placed on grafted areas, they have less volume and density, which can decrease the survival rate [3, 9]. This often requires additional surgeries to increase bone volume, adding to the complexity, costs, and morbidity of the procedures [10]. Given the mentioned risk factors, the decision was made to rehabilitate the patient using a PFP, due to the history of implant failure and the presence of unfavorable systemic conditions. In summary, this case underscores the importance of a thorough patient evaluation and a multidisciplinary approach in treatment planning.

4 | CONCLUSION

The case underscores the complexities involved in the oral rehabilitation of patients with a history of cleft lip and palate, compounded by systemic conditions such as diabetes and chronic smoking. The failures of previous surgical procedures highlight the critical need for a comprehensive and multidisciplinary approach to treatment planning. Rigorous preoperative evaluations, targeted interventions like smoking cessation programs, and careful selection of surgical techniques are paramount to improving outcomes. Moreover, continuous, and thorough long-term follow-up is essential to monitor healing, manage potential complications, and ensure the stability and success of the reconstructive efforts. Ensuring such meticulous care can significantly enhance the quality of life and functional outcomes for these patients.

5 | CONFLICT OF INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.
The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: None

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