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Conservative Feeding Management in an Infant with Pierre Robin Sequence: A Case Report

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Abstract
Pierre Robin sequence (PRS) is a congenital craniofacial condition characterized by mandibular micrognathia, glossoptosis, and upper airway obstruction, and is commonly associated with cleft palate. Feeding difficulties are frequently encountered in these infants and can lead to inadequate nutritional intake and an increased risk of aspiration. This case report presents the conservative feeding management of a 19-day-old preterm female infant weighing 1.6 kg, diagnosed with Pierre Robin sequence and referred with severe feeding difficulty and nasal regurgitation. Clinical examination revealed a retrognathic mandible, reduced lower facial height, a wide U-shaped cleft palate, posterior positioning of the tongue with glossoptosis, and absence of the uvula. As definitive surgical intervention was not planned in the immediate future, a palatal feeding obturator was fabricated to assist feeding. An addition silicone impression was used, and the obturator was fabricated using auto-polymerizing acrylic resin with a stainless-steel wire bow for retention. The appliance helped separate the oral and nasal cavities, thereby improving feeding and reducing nasal regurgitation. Follow-up showed better feeding and improved nutritional intake.
Conclusion*- This case demonstrates that a palatal feeding obturator can serve as a simple, conservative, non-invasive, and reversible method for improving feeding in infants with Pierre Robin sequence, particularly when surgical treatment needs to be delayed.*
Keywords*: Pierre Robin sequence, micrognathia, glossoptosis, cleft palate, feeding difficulty, feeding obturator, pediatric dentistry.*

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I. Introduction

Pierre Robin sequence (PRS) is a congenital craniofacial developmental anomaly characterized by a classical triad of mandibular micrognathia, glossoptosis, and upper airway obstruction. The underdeveloped mandible results in posterior displacement of the tongue, which compromises the upper airway and frequently interferes with feeding and respiration. A U-shaped cleft palate is commonly associated, although PRS may present either as an isolated entity or as part of a broader syndromic condition.[1]

The condition was first systematically described by Pierre Robin in the early 20th century, with seminal clinical observations published in 1923 and later expanded in 1934. Initially regarded as a syndrome, PRS was reclassified as a "sequence" in 1982 to reflect its pathogenetic mechanism, wherein mandibular hypoplasia initiates a cascade of secondary developmental anomalies. The reported prevalence of PRS is approximately 1 in 8,500 live births, making it a clinically significant subgroup within the cleft lip and palate population.[2]

PRS is a heterogeneous condition with an incompletely understood etiology. While it may occur in isolation, it is frequently observed in association with Mendelian syndromes such as Stickler syndrome, velocardiofacial syndrome, and Marshall syndrome. The advances in molecular genetics have implicated dysregulation of genes involved in craniofacial development, particularly SOX9 and KCNJ2, suggesting a genetic contribution to mandibular growth impairment and tongue positioning abnormalities.[3]

The airway obstruction in PRS has traditionally been considered an immediate neonatal concern; however, emerging evidence indicates that obstruction may develop days or even weeks after birth. This delayed presentation poses a substantial risk, especially following early hospital discharge, and has been associated with sudden deterioration and mortality. The clinical examination alone may be insufficient to predict the onset or

severity of airway compromise, objective monitoring methods such as polysomnography or continuous pulse oximetry are increasingly advocated. The close surveillance of feeding efficiency, weight gain, and respiratory status is therefore essential in all infants diagnosed with PRS.[4]

The management of PRS requires a comprehensive multidisciplinary approach involving neonatology, genetics, pulmonology, otolaryngology, maxillofacial surgery, dentistry, speech and feeding specialists, and other pediatric subspecialties. The therapeutic strategies are directed toward maintaining airway patency and ensuring adequate nutrition to support growth and development. The feeding difficulties are particularly challenging due to the combined effects of cleft palate, glossoptosis, and airway obstruction. In this context, prosthetic interventions such as palatal feeding obturators play a critical role in facilitating feeding, promoting weight gain, and reducing associated complications.[5]

II. Case Report

A 19-day-old pre-term female infant, underweight (1.6 kgs) diagnosed with Pierre Robin Syndrome was referred to the outpatient department with the complaint of difficulty in feeding. The child was born to healthy, non-consanguineous parents. Following a period of using the nasogastric intubation, the mother was advised to expel the milk into a feeding bottle and then feed the child as the oroantral communication could not facilitate breast feeding. The nasal regurgitation was still evident on bottle feeding; hence, the necessity for dental management arose.

The extra-oral examination revealed a retrognathic mandible and reduced lower facial height and the intra-oral examination revealed a wide U-shaped cleft of soft palate, posteriorly placed tongue and tendency of the tongue to fall backward toward the oropharynx, suggestive of glossoptosis and absence of uvula. Since the baby was not scheduled for corrective surgery in the near future, it was decided to construct a feeding obturator following approval from the parents so as to prevent nasal regurgitation or aspiration of milk into the trachea.

A pre-formed special tray constructed using self-cured acrylic resin was used to take impression using addition silicone impression material. The primary impressions were obtained with the infant positioned in a prone, face-down orientation to minimize the risk of aspiration in the event of regurgitation and to help maintain airway patency during the procedure. Based on the impressions, a feeding obturator was fabricated using auto-polymerizing acrylic resin. The retention was achieved with a 0.7-mm (21-gauge) stainless steel wire, contoured into a bow configuration and inclined approximately 40°–60° relative to the inter-commissural line. The leaf-shaped acrylic pads were incorporated at the terminal ends of the wire to facilitate secure handling and improve retention of the appliance.

Fig 1: Extra oral photograph

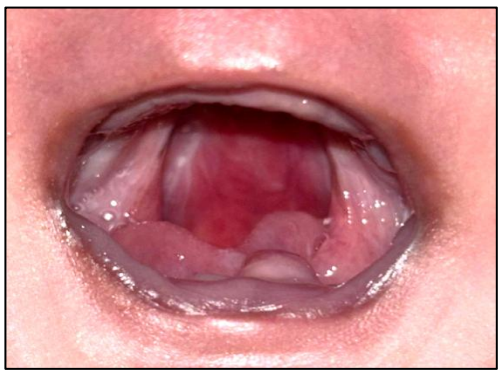

Fig 2: Intra oral photograph

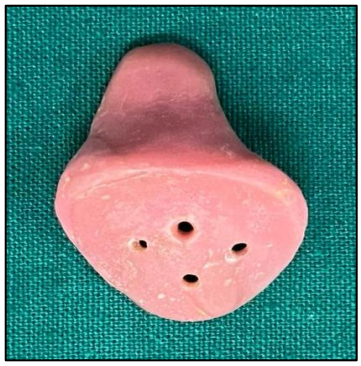

Fig 3: Special Tray

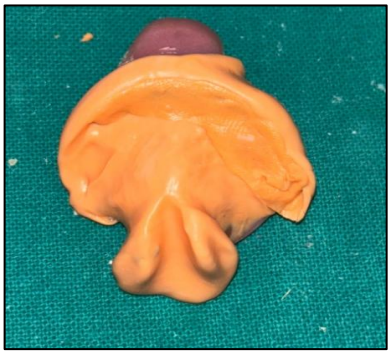

Fig 4: Impression made with addition silicone

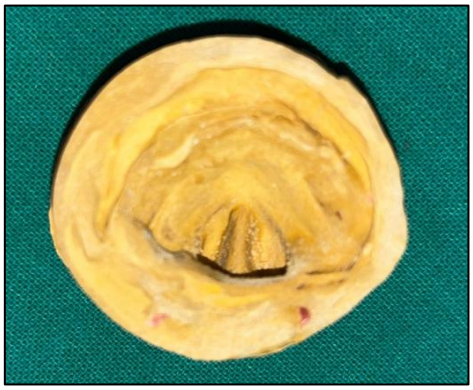

Fig 5: Cast with dental stone

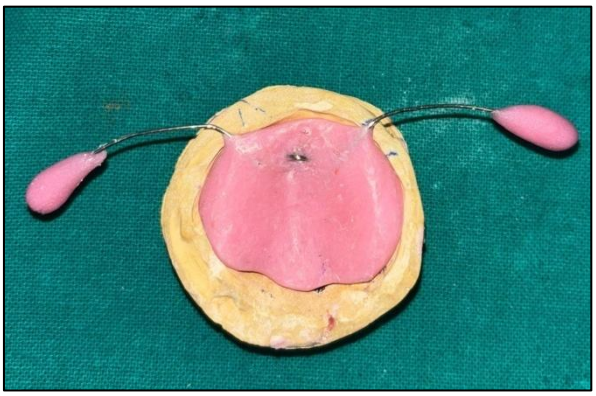

Fig 6: Obturator with cold cure acrylic resin

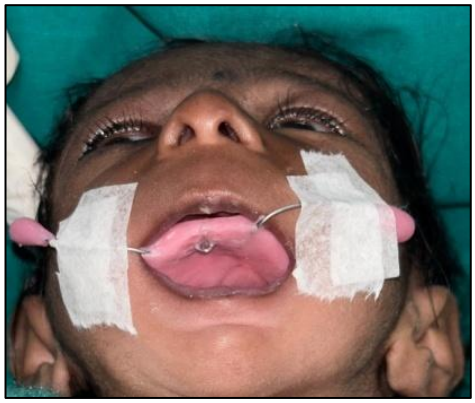

Fig 7: Feeding obturator intra-orally

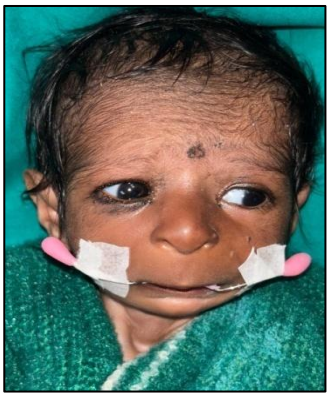

Fig 8: One-month follow-up

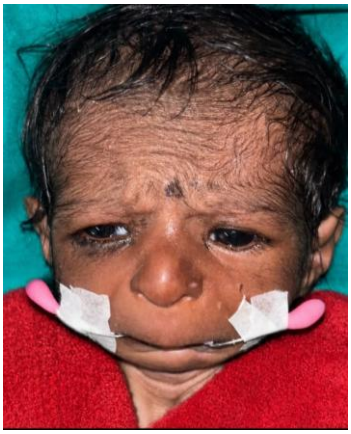

Fig 9: Three month follow-up

III. Discussion

Pierre Robin sequence represents a developmental cascade initiated by mandibular hypoplasia, which subsequently leads to posterior displacement of the tongue and compromise of the upper airway. The presence of a U-shaped cleft palate further exacerbates feeding and respiratory difficulties. In the present case, the infant exhibited the characteristic clinical triad along with severe feeding impairment and low birth weight, emphasizing the functional burden of PRS in the neonatal period.[6]

The feeding difficulties in such infants are multifactorial, resulting from poor oral seal, nasal regurgitation, impaired suck–swallow coordination, and the constant risk of airway obstruction. The early recognition and intervention are therefore essential to prevent growth retardation and secondary complications.[7]

Clinically, PRS must be differentiated from other craniofacial conditions that present with mandibular deficiency and airway compromise. The disorders such as Treacher Collins syndrome and velocardiofacial

syndrome exhibit additional craniofacial, cardiac, or auricular anomalies, while Stickler syndrome is associated with ocular, auditory, and skeletal manifestations. Unlike these conditions, isolated PRS lacks systemic involvement, although syndromic associations are common and must be carefully excluded. In the present case, the absence of extra-craniofacial anomalies and systemic findings supported a diagnosis of isolated PRS. Accurate differentiation is crucial, as syndromic forms often require long-term multidisciplinary surveillance and have differing prognostic implications.[8]

The airway obstruction in PRS is traditionally considered an immediate postnatal concern, several reports have demonstrated that respiratory compromise may develop days or weeks after birth. This delayed onset is clinically significant, as it may occur after hospital discharge and lead to sudden deterioration or even mortality. The infant in this report, though primarily referred for feeding difficulty, remained at risk due to glossoptosis, prematurity, and poor weight gain. These findings reinforce the importance of vigilant monitoring, as clinical assessment alone may not reliably predict airway obstruction. The objective tools such as polysomnography or continuous oxygen saturation monitoring have therefore been advocated, along with regular assessment of feeding efficiency and growth parameters.[9]

Radhakrishnan J and Sharma A demonstrated that a feeding plate effectively separates the oral and nasal cavities, improves feeding efficiency, and serves as a simple, economical, and non-invasive treatment option in neonates with PRS.[10] Marques IL et al. further advocated conservative management using feeding appliances, positional therapy, and close nutritional monitoring before considering surgical intervention, reporting favorable clinical outcomes in most infants managed with this protocol.[11] Furthermore, Bacher M et al. demonstrated that palatal appliances not only facilitate feeding but may also improve airway patency by promoting anterior positioning of the tongue, thereby reducing upper airway obstruction in selected patients.[12]

The management of feeding difficulties in PRS is primarily supportive and aims to ensure adequate nutrition while minimizing the risk of aspiration. Palatal feeding obturators provide a conservative and effective solution by obturating the cleft, reducing nasal regurgitation, and facilitating more efficient sucking. In the present case, fabrication of a feeding obturator allowed safer feeding and contributed to improved nutritional intake during a critical period of growth. Compared with surgical airway interventions, obturators are non-invasive, reversible, and well suited for early infancy, making them a valuable adjunct in the multidisciplinary management of PRS.[13]

IV. Conclusion

Pierre Robin sequence commonly leads to feeding difficulties and risk of airway compromise in early infancy. Early diagnosis and conservative management are essential to support growth and prevent complications.
This case demonstrates that a palatal feeding obturator is an effective, non-invasive aid for improving feeding and reducing nasal regurgitation when surgical intervention is deferred. A multidisciplinary approach with close monitoring ensures optimal outcomes in infants with PRS.

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