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CASE REPORT

Transition to oral feeding through oromotor and developmental rehabilitation in a peg-fed, visually impaired preterm triplet infant: A case report

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Abstract

His case report aimed to describe clinical outcomes following a combined rehabilitation program incorporating neuromuscular electrical stimulation (NMES), oromotor exercises, and developmental interventions in a PEG-fed, visually impaired preterm infant. The infant was born at 32 weeks of gestation with a birth weight of 1500 g as one of triplets and had visual impairment due to retinopathy of prematurity. Because oral feeding was not possible, nutrition was provided via percutaneous endoscopic gastrostomy (PEG). At baseline, Karaduman Chewing Performance Scale (KCPS) score was 4 and the Preterm Oral Feeding Readiness Assessment Scale (POFRAS) score was 19. The infant also exhibited low oral cavity tone, insufficient laryngeal elevation, and intolerance to oral feeding. Swallowing safety was assessed by an otorhinolaryngologist using fiberoptic endoscopic evaluation of swallowing (FEES); the Penetration–Aspiration Scale (PAS) score was 2, with no evidence of aspiration. The infant received a four-week combined rehabilitation program comprising 20 sessions (five sessions/week), including oromotor exercises, oral sensory stimulation, developmental physiotherapy, and NMES. Each session lasted approximately 60 minutes, including 40 minutes of NMES, and a home program was provided to the family. Following the intervention, the KCPS score improved from 4 to 3, while the POFRAS score increased from 19 to 31. Follow-up FEES performed by the otorhinolaryngologist showed that the PAS score remained at 2, with no evidence of aspiration. Oral cavity tone and laryngeal elevation improved, and tolerance to pacifier use and oral feeding increased. Oral feeding was initiated; however, PEG feeding was continued because oral intake remained insufficient to meet the infant's nutritional requirements. These findings suggest that the combined rehabilitation program, integrating NMES with oromotor, sensory, and developmental interventions, may support the transition toward oral feeding in PEG-fed preterm infants with additional disabilities.

Introduction

According to the definitions of the American College of Obstetricians and Gynecologists and the American Academy of Pediatrics (AAP), infants born before completing 37 weeks of gestation are defined as preterm infants (Fleischman et al., 2010; Engle et al. 2007). Preterm birth is known worldwide as one of the leading causes of neonatal mortality and morbidity. Due to the incomplete development of body systems, preterm infants frequently experience various problems such as respiratory instability, visual impairments and retinopathy, hypothermia, and hyperbilirubinemia (Özbey et al., 2020; Zengin et al., 2023). In approximately 40–70% of preterm infants, oral feeding is difficult or impossible because of gastrointestinal immaturity and inadequate coordination of sucking–swallowing–breathing as well as insufficient oromotor reflexes, necessitating prolonged enteral feeding (Dodrill & Gosa, 2015; Vural 2017).

Preterm birth, prolonged neonatal intensive care unit stay, neurodevelopmental problems, and lack of oral experience are among the major factors that negatively affect the development of oral feeding skills. In such cases, enteral feeding via a nasogastric (NG) tube or percutaneous endoscopic gastrostomy (PEG) is

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commonly applied. Long-term feeding with NG or PEG tubes reduces oral motor sensory input and consequently delays the development of swallowing functions. This delay affects not only the infant's growth stages but also motor development, postural control, and overall quality of life (Ross & Browne 2013). Therefore, early initiation of oromotor and swallowing rehabilitation, postural adjustments, sensory stimulation, developmental physiotherapy, and family education is of critical importance in preterm and high-risk infants (Benfer et al., 2017). Moreover, a multidisciplinary team approach involving neonatologists, physiotherapists, speech and language therapists, and dietitians plays a fundamental role in ensuring safe and effective feeding and in accelerating the transition to oral feeding in these infants (Lubbe, 2018; Gosa et al., 2020; Comuk Balci et al., 2023). Prolonged hospitalization and extended dependence on tube feeding may further limit opportunities for positive oral experiences and age-appropriate sensorimotor development. Consequently, infants with complex medical histories may develop persistent difficulties in oral feeding and require individualized rehabilitation during the transition from tube to oral feeding (Lively et al., 2023).

Although oral feeding problems are common in preterm infants, the presence of additional health conditions further complicates this process. Visual impairment may represent an additional challenge during feeding development because visual information contributes to anticipatory responses, caregiver–infant interaction, and the integration of sensory experiences during feeding. In infants with visual impairment, reduced visual input may therefore increase reliance on tactile, proprioceptive, gustatory, and auditory cues during the development of feeding skills (Cemali et al., 2023). Reports in the literature addressing feeding rehabilitation in preterm infants who are fed via PEG and also have visual impairment are very limited. In addition, detailed clinical case reports focusing on feeding difficulties in infants born from triplet pregnancies are rare. In this context, the present case describes the clinical course and feeding-related outcomes of a PEG-fed, visually impaired preterm infant born as part of a triplet pregnancy following a combined rehabilitation program integrating oromotor exercises, oral sensory stimulation, neuromuscular electrical stimulation (NMES), developmental physiotherapy, therapeutic positioning, and family-based home interventions.

Methods

Case Presentation

A male infant was born at 32 weeks of gestation with a birth weight of 1500 g as one of triplets. Following birth, he received treatment in the neonatal intensive care unit (NICU) for 13 weeks and subsequently in the pediatric intensive care unit (PICU) for 8 months. During this period, he underwent cardiac surgery and shunt placement. The infant had visual impairment, while hearing function was preserved. After long-term feeding via a nasogastric (NG) tube, feeding was continued through percutaneous endoscopic gastrostomy (PEG). He had never received breast milk and had not used a pacifier. Oral awareness had not developed, and the gag reflex was positive. Head control had not developed, and there was no spontaneous postural control. Due to the presence of the PEG tube, the infant had never been placed in the prone position, and marked intolerance to this position was observed. After a five-week period at home, the patient was admitted for swallowing and developmental physiotherapy assessment at a corrected age of 11 months.

Baseline and follow-up assessments of the infant's chewing and oral feeding skills were conducted using two standardized scales. Chewing performance was evaluated with the Karaduman Chewing Performance Scale (KCPS), a five-level scale scored from 0 to 4, in which 0 indicates normal chewing function and 4 indicates inability to feed orally (Serel et al., 2016). Readiness for oral feeding was assessed using the Preterm Oral Feeding Readiness Assessment Scale (POFRAS). The POFRAS consists of 18 items, each scored from 0 to 2, with a maximum total score of 36; a score of 19 or higher indicates suitability for oral feeding in preterm infants (Çamur & Çetinkaya, 2021). Both scales were administered in accordance with the infant's age and tolerance during the assessment.

Swallowing safety was objectively assessed by an otorhinolaryngologist using fiberoptic endoscopic evaluation of swallowing (FEES) at baseline and after the intervention. Findings were rated using the Penetration–Aspiration Scale (PAS). The PAS score was 2 at baseline, indicating penetration above the vocal folds without aspiration. The same FEES-based assessment was repeated after the intervention to evaluate swallowing safety.

Head and trunk control were evaluated using the Segmental Assessment of Trunk Control (SATCo). The SATCo is a valid and reliable measure that assesses head

and trunk control across different trunk segments (Butler et al., 2010). The scale evaluates the head, upper trunk, mid trunk, and lower trunk segments separately, with scoring as follows: 0 = no head/trunk control, 1=partial control with support and 2=independent control. In addition, other developmental and swallowing-related parameters, including laryngeal elevation, oral tone, pacifier tolerance, and intake of liquid and thickened foods, were assessed at baseline (Table 1). These initial assessments served as reference points for both intervention planning and monitoring of progress.

At the initial evaluation, the KCPS score was 4, indicating the absence of functional chewing ability, and the POFRAS score was 19. The baseline PAS score was 2, with no evidence of aspiration on FEES. Laryngeal elevation was weak, and oral tone was low. The infant was unable to tolerate oral feeding and did not accept a pacifier. Head control, assessed by SATCo, was scored as 0.

Procedure

All interventions were conducted between May and June 2025 at the Pediatric Rehabilitation Research Laboratory, Department of Physiotherapy and Rehabilitation, Nezahat Keleşoğlu Faculty of Health Sciences, Necmettin Erbakan University. The treatment program was carried out five days per week for a total of 20 sessions over four weeks, with each session lasting approximately 60 minutes. The program consisted of two main components: oromotor and swallowing rehabilitation, and developmental physiotherapy with postural support interventions.

Within the scope of oromotor and swallowing rehabilitation, thermal–tactile stimulation, lip closure exercises, intraoral cheek massage, tongue movement exercises, and chewing training were applied. In addition, oral sensory awareness was supported through taste and texture training, and controlled tactile stimulation was performed while considering the presence of a positive gag reflex. From the first day, the family was included in an individualized home program and actively participated in the rehabilitation process. The home program was structured with exercises appropriate to the infant's age and tolerance.

To support laryngeal elevation, neuromuscular electrical stimulation (NMES) was applied during each session. NMES was delivered using the VitalStim® Therapy System (Chattanooga, USA) for 40 minutes per session. The electrodes were positioned over the submental and suprahyoid regions to target the muscles involved in hyolaryngeal elevation. The stimulation parameters were set at a frequency of 80 Hz and a pulse width of 300 μs (Propp et al., 2022). The stimulation intensity was gradually increased according to the infant's individual tolerance and maintained at the highest tolerated level without signs of discomfort. The infant was monitored throughout each session for behavioral signs of discomfort or intolerance and for local skin reactions. No pain, skin irritation, adverse events, or intolerance related to NMES were observed during the 20 treatment sessions.

Table 1
Baseline assessment findings and scores.

Characteristic / Measurement	Status / Score
Gestational age	32 weeks
Birth weight	1300 g
Sex	Male
Intensive care stay	NICU: 13 weeks, PICU: 8 months
Surgical history	Cardiac surgery, shunt placement
Feeding method	NG tube → PEG
Breast milk / pacifier	No / No
Head control (SATCo)	0
Prone position tolerance	None
PAS	2
KCPS	4
POFRAS	19
Laryngeal elevation	Weak
Oral tone	Low
Oral feeding tolerance	None
Pacifier acceptance	None

PAS: Penetration-Aspiration Scale; KCPS: Karaduman Chewing Performance Scale; POFRAS: Preterm Oral Feeding Readiness Assessment Scale; SATCo: Segmental Assessment of Trunk Control; NG: Nasogastric tube; PEG: Percutaneous endoscopic gastrostomy; NICU: Neonatal intensive care unit; PICU: Pediatric intensive care unit.

Developmental physiotherapy and postural support interventions focused on improving head control through therapeutic positioning and facilitation techniques. Gradual tolerance to the prone position, which the infant had not previously experienced, was developed, and head control exercises were performed in this position. As the sessions progressed, tolerance to the prone position increased markedly, and this position was actively used to promote head control and postural activation. In addition, an individualized seating and feeding chair was selected to support oral intake, and the family was guided regarding its provision. Appropriate positioning strategies and home-based physiotherapy approaches were demonstrated to the family to reduce the risk of scoliosis development.

The home program also included detailed instruction on thermal–tactile stimulation, taste and texture training, chewing exercises, tongue movements, laryngeal elevation mobilization, controlled oral sensory stimulation considering the positive gag reflex**,** and head control exercises in the prone position (Boiron et al., 2007). The family was informed about safety precautions and potential reflex responses during implementation (Table 2). This comprehensive approach was intended to support continuity and safe implementation of the exercises at home.

The family was individually instructed on how to perform the exercises, safety precautions, and appropriate responses to potential reflex reactions. Written and visual materials were provided. This approach ensured both the continuity of the exercises and their safe implementation.

Results

Following the four-week intervention period, changes were observed in feeding-related outcomes (Table 3). The KCPS score decreased from 4 at baseline to 3 at the final assessment, indicating improvement in chewing performance. The POFRAS score increased from 19 to 31, indicating increased readiness for oral feeding. Follow-up FEES performed by the otorhinolaryngologist showed that the PAS score remained at 2, with no aspiration observed.

Table 2
Oromotor and developmental rehabilitation interventions and home exercise program.

Intervention	Frequency / Duration	Purpose	Application
NMES (Neuromuscular Electrical Stimulation)	40 min per session	To support laryngeal elevation and activate swallowing muscles	Electrodes were placed on the submental and suprahyoid regions; frequency 80 Hz, pulse width 300 µs, intensity set to the maximum level tolerated by the infant (Boiron et al., 2007).
Thermal–tactile stimulation	15 min per session	Modulation of gag reflex and oral tolerance, facilitation of swallowing	Controlled cold stimulation applied to the tongue, lips, cheeks, and faucial arches using a swab (Cook et al., 2023).
Lip closure and intraoral cheek massage	2–3 min before feeding	Improvement of lip tone and oral control	Massage applied at home by the caregiver using the little finger (Marin et al., 2024).
Tongue movement exercises	2 sets/day, 5 repetitions	Enhancement of tongue control and oral awareness	Performed passively with assistance according to the infant's tolerance (Gosa et al., 2020).
Chewing training	1–2 sets daily	Activation of masticatory muscles	Performed using textured chewing sticks (Serel et al., 2017).
Laryngeal elevation mobilization	1–2 times daily	To improve swallowing efficiency	Applied in a controlled manner with minimal aspiration risk (Boiron et al., 2007).
Controlled oral sensory stimulation	1–2 times daily	To improve oral sensory tolerance while considering the positive gag reflex	Applied through controlled tactile stimulation (Marin et al., 2024).
Head control exercises in the prone position	3–5 min intervals, 3–4 times/day	Improvement of head control and postural tolerance	Also performed at home with safety precautions; therapeutic positioning and assistive equipment were used (Marin et al., 2024).
Postural support and sitting training	5 times/day, 10–25 min	Postural stability and safe feeding	Use of a seating chair with caregiver guidance and safety precautions.
Taste and texture training	3 times/day, 5–10 min	Enhancement of taste and texture awareness and support of oral tolerance	Controlled trials with different textures and tastes, considering the positive gag reflex (Gosa et al., 2017).

Laryngeal elevation and oral tone improved during the intervention period, with increased tone observed in the lip, cheek, and tongue muscles. Pacifier tolerance, which was absent at baseline, increased to 30–40 seconds at the final assessment. Tolerance to the prone position, which had not previously been experienced, also increased, accompanied by improvements in head control and postural tolerance.

Oral feeding was gradually introduced under controlled conditions during the intervention period. At the 10th session, oral trials with thickened foods, such as yogurt, were initiated. By the 15th session, bottle feeding with water was better tolerated than spoon feeding, and liquids were subsequently incorporated into the structured feeding program. Thickened foods, including yogurt, pudding, fruit concentrates, and yogurt-based soups, were also introduced according to the infant's tolerance. Although oral feeding was initiated and incorporated into the daily feeding routine, PEG feeding was continued because oral intake remained insufficient to meet the infant's full nutritional requirements.

The observed changes occurred during a multimodal rehabilitation program integrating NMES, oromotor exercises, oral sensory stimulation, developmental physiotherapy, therapeutic positioning, and family-based home exercises. As these interventions were delivered concurrently, the contribution of any individual component, including NMES, could not be determined separately. The family was instructed in home-based chewing exercises using textured sticks, laryngeal elevation mobilization, passive tongue movements, oral sensory stimulation, and developmental exercises. Although the family reported performing the recommended activities at home, adherence to the home program was not objectively quantified.

Overall, these findings indicate that structured oromotor–swallowing rehabilitation combined with developmental physiotherapy is effective in improving oral feeding skills and supporting overall functional recovery in preterm infants who are PEG-fed and have experienced prolonged intensive care and developmental risk factors.

Regarding head control assessed using SATCo, the infant scored 0 at baseline, indicating the absence of independent head control. At the final assessment, the SATCo head-control score increased to 2, indicating independent head control according to the scoring criteria used.

According to family reports, the infant showed increased comfort during home-based feeding practices, greater tolerance to pacifier use and oral intake of thickened and liquid foods, and better adaptation to new positions, particularly the prone position. The family also reported increased nighttime sleep duration and fewer episodes of daytime muscle stiffness when appropriate postural support and feeding positions were used. These observations were based on family reports and were not assessed using standardized outcome measures.

Table 3
Pre- and post-intervention assessment findings and functional changes.

Measurement / Parameter	Pre-test (Baseline)	Post-test (After 20th Session)	Observed Improvement / Notes
KCPS	4	3	Improvement in chewing performance
PAS	2	2	PAS remained 2 on follow-up FEES; no aspiration was observed
POFRAS	19	31	Increased oral feeding readiness score
SATCo	0	2	Short-term independent head control achieved
Laryngeal elevation	Weak	Strengthened	Improved swallowing efficiency
Oral tone	Low	Increased	Increased tone in lip, cheek, and tongue muscles
Pacifier tolerance	0 s	30–40 s	Development of non-nutritive sucking
Prone position tolerance	None	Markedly increased	Improved head control and postural tolerance
Oral intake (thickened foods)	None / minimal	Planned daily intake	Foods such as yogurt, pudding, and fruit concentrates tolerated safely
Oral intake (liquids)	None / minimal	Planned daily intake	Adaptation to spoon and bottle feeding achieved
Family observations	–	–	Family-reported increased feeding comfort, nighttime sleep duration, and reduced daytime muscle stiffness

KCPS: Karaduman Chewing Performance Scale; PAS: Penetration-Aspiration Scale; POFRAS: Preterm Oral Feeding Readiness Assessment Scale; SATCo: Segmental Assessment of Trunk Control.

Discussion

This case report describes feeding-related and developmental changes observed following a structured, multimodal rehabilitation program in a PEG-fed, visually impaired preterm infant with a prolonged history of intensive care. At baseline, the infant had no independent head control or tolerance to the prone position, had no functional chewing ability (KCPS score: 4), and showed limited readiness for oral feeding (POFRAS score: 19). Following the four-week program integrating NMES, oromotor exercises, oral sensory stimulation, taste and texture training, developmental physiotherapy, therapeutic positioning, and family-based home exercises, the KCPS score decreased from 4 to 3, the POFRAS score increased from 19 to 31, and the SATCo score increased from 0 to 2. Importantly, follow-up FEES showed that the PAS score remained at 2, with no aspiration observed. Oral feeding was gradually introduced during the intervention period; however, PEG feeding was continued because oral intake remained insufficient to meet the infant's full nutritional requirements. Taken together, these findings indicate a transition toward oral feeding rather than complete independence from tube feeding. These findings suggest that intensive and individualized therapeutic approaches may accelerate the transition to oral feeding and enhance functional outcomes in preterm infants with additional risk factors (Ross & Browne, 2013; Törüner & Altay, 2013; Terek & Yalaz, 2019).

In addition to the feeding-related changes, the family reported increased nighttime sleep duration and fewer episodes of daytime muscle stiffness during the intervention period. These changes were observed alongside the introduction of therapeutic positioning and appropriate feeding positions. However, sleep, muscle stiffness, and gastroesophageal reflux were not evaluated using standardized or objective measures; therefore, no causal relationship between these family-reported changes and the rehabilitation program can be established. These observations should be interpreted as secondary caregiver-reported findings rather than treatment outcomes.

The literature shows that oral–motor stimulation sessions provided to high-risk infants shorten the transition time to oral feeding and improve oral intake skills (Fucile et al., 2011; Younesian et al., 2015). Studies conducted in Türkiye have also reported that oral–motor exercises accelerate feeding functions, shorten the transition to oral feeding, and reduce length of hospital stay (Gözen & Aykanat Girgin, 2017; Kurt Sezer & Küçükoğlu, 2020). In the present case, regular application of oromotor exercises resulted in marked improvements in laryngeal elevation and oral tone, with a significant increase in tolerance to oral intake. These results are consistent with previous findings demonstrating that non-nutritive sucking and oral stimulation support swallowing and respiratory coordination in high-risk infants (Boiron et al., 2007).

NMES was included as an adjunctive component of the multimodal intervention in the present case. A systematic review by Propp et al. (2022) examining NMES for dysphagia in children reported potential improvements in swallowing-related outcomes; however, the available studies were heterogeneous, had moderate-to-high risk of bias, and provided limited information on long-term outcomes. Therefore, the evidence remains insufficient to establish the independent effectiveness of NMES in pediatric dysphagia. In the present case, NMES was applied concurrently with oromotor exercises, oral sensory stimulation, developmental physiotherapy, therapeutic positioning, and a family-based home program. Consequently, although improvements in feeding-related outcomes were observed during the intervention period, the specific contribution of NMES cannot be isolated from the other components of the rehabilitation program.

The development of head control and tolerance to the prone position directly supported postural activation and safe oral intake. The literature emphasizes the relationship between postural stability and oromotor functions, noting that adequate head–trunk control facilitates safe swallowing (Fucile et al., 2011; Girgin et al., 2021]. Postural stability and head–trunk control are important components of feeding and swallowing function, as adequate proximal stability provides a biomechanical basis for coordinated oral and pharyngeal motor activity. Appropriate head and neck alignment may facilitate more effective control of the muscles involved in swallowing and contribute to optimal feeding performance. In the present case, the infant had no independent head control at baseline (SATCo score: 0) and had never experienced the prone position. Following the gradual introduction of therapeutic prone positioning and head-control exercises, the SATCo score increased to 2, indicating independent head control, together with increased tolerance to the prone position. These postural changes occurred concurrently with improvements in oral tone, laryngeal elevation, chewing performance, and oral

feeding readiness. Although a direct causal relationship between improved head control and swallowing outcomes cannot be established from a single case, enhanced postural control may have provided a more stable biomechanical basis for the development of feeding-related motor functions.

This study also highlights the critical role of family education and active caregiver involvement in the treatment process. Ensuring continuity of oromotor exercises at home through family participation has been shown to be important for maintaining motivation and facilitating the transition to oral feeding (Girgin et al., 2021). In the present case, high family adherence and the successful transfer of clinical gains into daily life contributed to positive secondary outcomes, such as reduced muscle stiffness and increased sleep duration.

Transition from long-term tube feeding to oral feeding is a complex process, particularly in children with prolonged medical histories and limited previous oral feeding experience (Lively et al., 2023; Goldstein et al., 2025). Children who receive prolonged nasogastric or gastrostomy feeding may have limited opportunities for oral feeding experiences and may develop acquired oral aversion, further complicating the acquisition of oral feeding skills (Goldstein et al., 2025). Current evidence suggests that tube-to-oral feeding programs commonly require multidisciplinary, individualized, and multicomponent approaches that may include feeding-related interventions, caregiver training, behavioral strategies, and nutritional monitoring (Lively et al., 2023; Goldstein et al., 2025). In preterm infants, individualized assessment of oral feeding readiness and oral motor skills is also important when progressing from tube to oral feeding (El-Kassas et al., 2024). In the present case, oral feeding was gradually introduced during the rehabilitation period, but PEG feeding was maintained because oral intake remained insufficient to meet full nutritional requirements. Therefore, the observed clinical course should be interpreted as progress toward oral feeding rather than complete tube weaning.

Visual impairment may represent an additional challenge in the development of feeding skills because feeding requires the integration of multiple sensory inputs. In children with cerebral palsy and cerebral visual impairment, sensory processing difficulties have been associated with greater feeding problems, suggesting that impaired visual input may further complicate feeding-related sensory processing (Goday et al., 2019; Cemali et al., 2023). More recently, a randomized controlled study demonstrated that feeding behavior training combined with sensory integration therapy improved feeding behaviors and specific sensory processing domains, including oral sensitivity, in children with cerebral palsy and cerebral visual impairment (Cemali et al., 2026). Although the population of these studies differs from that of the present case, these findings support consideration of visual and sensory limitations when planning feeding rehabilitation. In the present case, oral sensory stimulation, taste and texture exposure, and controlled tactile stimulation were therefore incorporated as components of the multimodal rehabilitation program.

The prolonged NICU and PICU course should also be considered when interpreting the feeding difficulties observed in this case. The infant spent 13 weeks in the NICU followed by 8 months in the PICU and had a prolonged history of NG and subsequent PEG feeding, with no previous breastfeeding or pacifier experience. Such a complex medical history may limit opportunities for typical oral feeding experiences during an important period of feeding development. Prolonged tube dependence and limited oral feeding experience may further complicate the subsequent transition toward oral feeding, particularly in medically complex children (Lively et al., 2023; Goldstein et al., 2025). In the present case, the initial absence of oral awareness, inability to tolerate a pacifier, and lack of previous oral feeding experience should therefore be interpreted within the broader context of prematurity, prolonged hospitalization, and long-term tube feeding.

This case report has several limitations. First, the findings are based on a single infant and therefore cannot be generalized to the broader population of preterm infants with complex feeding difficulties. Second, the intervention period was limited to four weeks, and no long-term follow-up was available to determine whether the observed changes were maintained over time or whether further progression toward complete oral feeding and PEG weaning occurred. Third, the rehabilitation program was multimodal and included NMES, oromotor exercises, oral sensory stimulation, developmental physiotherapy, therapeutic positioning, and family-based home exercises. Because these interventions were delivered concurrently, the independent contribution of NMES or any other individual component cannot be determined. In addition, adherence to the home program was not objectively quantified, and some secondary observations, including changes in sleep and daytime muscle stiffness, were based on family reports rather than standardized outcome measures. Finally, although

oral feeding was initiated during the intervention period, quantitative measures of daily oral caloric intake and a standardized functional oral intake scale were not used. These limitations should be considered when interpreting the clinical changes observed in this case.

Conclusion

This case report describes progress toward oral feeding following a holistic, multimodal rehabilitation program integrating structured oromotor and swallowing rehabilitation with developmental physiotherapy in a visually impaired preterm infant who underwent prolonged intensive care. Therapeutic positioning, postural support, appropriate feeding equipment, family education, and NMES were incorporated as components of the rehabilitation program. During the intervention period, improvements were observed in chewing performance, oral feeding readiness, head control, postural tolerance, and oral intake. In particular, tolerance to the prone position, which had not previously been experienced by the infant, increased alongside improvement in head control.

The family also reported longer nighttime sleep duration and reduced daytime muscle stiffness during the intervention period. However, these observations were not assessed using standardized outcome measures and therefore should be interpreted cautiously.

Follow-up FEES showed that the PAS score remained at 2, with no aspiration observed. Oral feeding was gradually introduced during the intervention period; however, PEG feeding was continued because oral intake remained insufficient to meet the infant's full nutritional requirements. Therefore, the clinical course observed in this case represents progress toward oral feeding rather than complete transition from tube feeding.

The findings of this case support the consideration of individualized, multidisciplinary rehabilitation approaches that integrate feeding-related interventions, developmental physiotherapy, appropriate positioning, family education, and home-based activities in medically complex, tube-fed preterm infants. However, because multiple intervention components were applied concurrently, the contribution of any individual component, including NMES, cannot be determined.

Future studies involving larger sample sizes, standardized functional feeding outcomes, and long-term follow-up are needed to evaluate the generalizability and sustainability of these findings.

Author Contributions

Study Design: NAY, PP, FE; Data Collection: NAY; Statistical Analysis: FE; Manuscript Preparation: NAY, PP; Funds Collection: NAY, FE.

Ethical Approval

Ethical committee approval was not required for this case report. However, the study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Written informed consent was obtained from the patient's legal guardian for participation and publication of the case details

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Conflict of Interest

The authors hereby declare that there was no conflict of interest in conducting this research.

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