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Effects of Pharyngeal Flap Surgery on Patients' Quality of Life Following Cleft Palate and Velopharyngeal Insufficiency

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Abstract

Background: Cleft palate repair often results in velopharyngeal insufficiency (VPI) as a complication which can cause persistent speech issues, psychosocial problems, and diminished overall quality of life. Pharyngeal flap surgery is frequently performed to treat stubborn VPI but more research is needed to assess its overall effect on patients' functioning and well-being. To assess the effects of pharyngeal flap surgery on the quality of life of patients with cleft palate and VPI, evaluating changes in speech, emotional well-being, social interaction, and self-confidence.

Methods: An observational study was carried out between January 2022 and January 2023 at Khalifa Gull Nawaz Medical Teaching Institute Bannu. It included 52 patients with diagnosed VPI who had previously undergone cleft palate repair. Data were collected both preoperatively and postoperatively through a validated quality of life instrument. In addition, speech therapy records along with the complication profiles and satisfaction scores of the parents, were also evaluated. Statistical analysis was conducted using paired t-tests.

Results: Significant improvements were observed in all domains of quality of life following surgery. The mean overall score increased from 48.6 ± 9.2 to 78.4 ± 8.5 ($p < 0.001$). Speech function, emotional well-being, and social interaction scores also improved markedly. Most patients (73.1%) experienced no complications, and over 90% of caregivers reported being satisfied with the outcomes.

Conclusion: Pharyngeal flap surgery substantially improves quality of life in patients with VPI, particularly in speech and psychosocial domains. The procedure is safe and well-accepted by families, highlighting its role as a key component in comprehensive cleft care.

Keywords: Cleft palate, Velopharyngeal insufficiency, Pharyngeal flap surgery, Speech outcomes, Quality of life, Pediatric surgery

INTRODUCTION

Cleft palates rank among the most prevalent congenital craniofacial disorders, frequently necessitating a series of surgical and therapeutic procedures throughout a child's development. Many children still face complications of velopharyngeal insufficiency (VPI) following their first surgery, despite advancements in surgical approaches. VPI is the failure to close the velopharyngeal valve during speech, leading to the loss of proper speech sounds, nasal emission of air, and diminished clarity of speech [1-3].

In children with VPI, the implications go deeper than just speech issues. It can greatly affect an individual's social engagement, academic achievement, as well as their self-worth. These issues, if not managed, can lead to emotional and psychological difficulties in the long run. While speech therapy may provide some benefits, it is often accompanied by surgery if there are anatomical gaps that require correction [4-6].

Pharyngeal flap surgery is an established surgical procedure used to narrow the velopharyngeal gap and regain normal speech resonance. Despite the surgery's documented technical success in speech improvement, its impact on the patient's overall quality of life emotional, social, or otherwise has not been fully examined in our context [7-9].

This study was undertaken to fill this gap by assessing how pharyngeal flap surgery affects various dimensions of quality of life in patients with cleft palate and VPI. By exploring changes in speech, social confidence, emotional health, and caregiver satisfaction, this research aims to provide a more holistic understanding of surgical outcomes and guide future cleft care strategies.

METHODOLOGY

This research was carried out as a prospective observational study over the course of twelve months, beginning January 2022 and ending January 2023. It was undertaken within the Department of Plastic Surgery of Khalifa Gull Nawaz Medical Teaching Institute Bannu, which is a tertiary referral hospital located at a cleft and craniofacial anomalies hot spot. The study received approval from the ethics committee of [Insert Institution Name Here]. Active consent was acquired from the parents or custodians for all the subjects. Privacy of patient records was rigorously ensured during the entire course of the research.

The study included an entirety of 52 participants. The sample size for this study was derived from the convenience sampling method, taking into account the typical patient volume and accessibility of relevant data during the timeframe of the study. All patients who met the selection criteria and gave informed consent were enrolled in the study sequentially.

Inclusion Criteria

- Patients aged 4 to 15 years diagnosed with velopharyngeal insufficiency (VPI) following cleft palate repair
- Undergoing pharyngeal flap surgery for correction of VPI
- Availability of preoperative and postoperative follow-up data for quality of life assessment
- Consent obtained from parents or legal guardians

Exclusion Criteria

- Patients with syndromic cleft conditions or severe cognitive impairment
- Prior history of failed pharyngeal flap surgery
- Incomplete follow-up data or lost to follow-up
- Presence of other concurrent surgeries or interventions affecting speech

Data was collected using a structured proforma that included patient demographics, clinical characteristics, type of cleft, previous surgical history, and details of speech therapy. Quality of life was assessed using a validated questionnaire tailored for velopharyngeal insufficiency, which captured five main domains: overall quality of life, speech function, social interaction, emotional wellbeing, and self-confidence in speaking.

Each participant was evaluated preoperatively and at a minimum of three months postoperatively. Parents or caregivers completed the questionnaires for younger children, while older children participated directly in the assessment.

All patients underwent a standardized superiorly based pharyngeal flap procedure under general anesthesia, performed by a team of experienced plastic surgeons. Intraoperative and postoperative data, including any complications, were documented systematically.
Postoperative care included regular outpatient follow-up visits, wound care instructions, and referral to speech therapy when indicated. The final quality of life assessment was conducted after the patient had completed a minimum of three months of recovery.
All data were entered and analyzed using SPSS version 25. Descriptive statistics such as frequencies, percentages, and means ± standard deviations were calculated for demographic and clinical variables. Paired t-tests were applied to compare preoperative and postoperative quality of life scores across different domains. A p-value of less than 0.05 was considered statistically significant.

RESULTS

The study included a total of 52 participants who underwent pharyngeal flap surgery. The majority of patients (48.1%) were between 7 and 10 years of age, while 32.7% fell into the 11–15 years category, indicating that most surgeries were performed during mid-childhood. The gender distribution was fairly balanced, with 51.9% males and 48.1% females. A larger proportion of participants resided in urban areas (65.4%), suggesting better access to surgical care in city settings. Regarding socioeconomic status, more than half (51.9%) belonged to the middle-income group, followed by 30.8% from low-income backgrounds, and only 17.3% from high-income families. These findings reflect a diverse yet representative population often seen in cleft care services in public-sector hospitals.

Table 1: Demographic Characteristics of Participants (n = 52)

Variable	Category	Frequency (%)
Age Group (years)	4–6	10 (19.2%)
	7–10	25 (48.1%)
	11–15	17 (32.7%)
Gender	Male	27 (51.9%)
	Female	25 (48.1%)
Residence	Urban	34 (65.4%)
	Rural	18 (34.6%)
Socioeconomic Status	Low	16 (30.8%)
	Middle	27 (51.9%)
	High	9 (17.3%)

All participants had a history of cleft palate surgery prior to undergoing the pharyngeal flap procedure. Half of the cases (50%) had cleft lip and palate, while 42.3% had isolated cleft palate, and 7.7% were diagnosed with submucous cleft palate. Speech therapy was a major component of care, with 57.7% receiving therapy both before and after surgery, while 19.2% had only preoperative therapy. Notably, a small subset (9.6%) did not receive any speech therapy, highlighting gaps in rehabilitation services. Regarding complications, 73.1% of patients had no postoperative issues, while snoring and sleep apnea were reported in 15.4% and 7.7% respectively. Minor infection occurred in only 3.8% of cases, suggesting the surgery was generally safe with low morbidity.

Table 2: Clinical Characteristics of Patients Undergoing Pharyngeal Flap Surgery

Variable	Category	Frequency (%)
Type of Cleft	Cleft palate only	22 (42.3%)
	Cleft lip and palate	26 (50.0%)
	Submucous cleft	4 (7.7%)
Prior Palatoplasty	Yes	52 (100%)
Speech Therapy (Pre/Post-op)	Pre-op only	10 (19.2%)
	Post-op only	7 (13.5%)
	Both	30 (57.7%)
	None	5 (9.6%)
Postoperative Complications	None	38 (73.1%)
	Snoring	8 (15.4%)
	Sleep apnea	4 (7.7%)

	Minor infection	2 (3.8%)

Quality of life improved significantly across all measured domains following pharyngeal flap surgery. The overall quality of life score increased from a mean of 48.6 before surgery to 78.4 after surgery, with a statistically significant p-value of <0.001. Improvements were particularly striking in speech function, which rose from 45.3 to 81.7, indicating enhanced intelligibility and reduced nasality. Similarly, social interaction scores improved from 50.2 to 75.9, reflecting better peer relationships and reduced stigma. Emotional wellbeing and self-confidence in speaking also showed substantial gains, with p-values indicating highly significant differences. These results strongly support the role of pharyngeal flap surgery in enhancing not only speech but also the psychosocial dimensions of life in patients with VPI.

Table 3: Comparison of Quality of Life Scores Pre- and Post-Surgery

QoL Domain	Preoperative (Mean ± SD)	Postoperative (Mean ± SD)	p-value
Overall QoL Score	48.6 ± 9.2	78.4 ± 8.5	<0.001
Speech Function	45.3 ± 10.4	81.7 ± 7.9	<0.001
Social Interaction	50.2 ± 12.3	75.9 ± 9.6	<0.001
Emotional Wellbeing	52.0 ± 11.8	79.5 ± 10.1	<0.001
Confidence in Speaking	42.8 ± 13.0	82.2 ± 6.7	<0.001

Parental satisfaction after surgery was overwhelmingly positive. Nearly two-thirds of caregivers (63.5%) reported being very satisfied with the outcomes, while an additional 26.9% were satisfied. Only a small minority expressed neutrality (5.8%) or dissatisfaction (3.8%). These responses mirror the improvements noted in clinical and quality-of-life outcomes, reinforcing the success of the surgical intervention from the family's perspective.

Table 4: Parental/Guardian Satisfaction after Surgery

Satisfaction Level	Frequency (%)
Very satisfied	33 (63.5%)
Satisfied	14 (26.9%)
Neutral	3 (5.8%)
Dissatisfied	2 (3.8%)

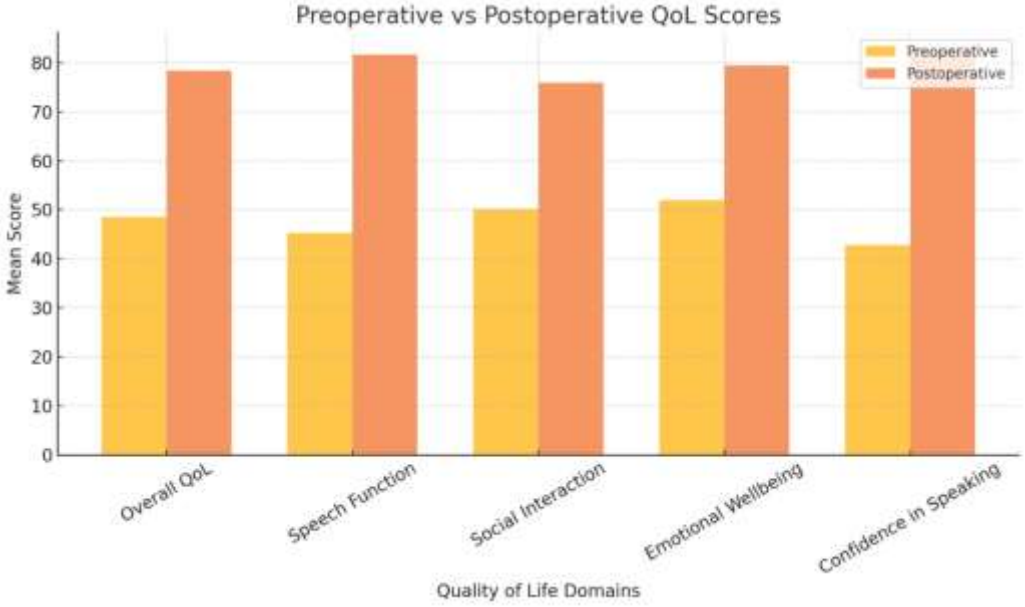

Figure 1: graph comparing preoperative and postoperative quality of life scores across different domains. It clearly illustrates significant improvements in all areas following pharyngeal flap surgery.

This study demonstrated a significant improvement in quality of life following pharyngeal flap surgery among patients with velopharyngeal insufficiency (VPI) secondary to cleft palate. Notably, improvements were observed across multiple domains, including speech function, social interaction,

emotional wellbeing, and self-confidence in speaking. These findings align with prior studies that underscore the efficacy of pharyngeal flap surgery in enhancing both functional and psychosocial outcomes in children with cleft-related VPI[10-12].

One of the most critical domains impacted by VPI is speech. In the present study, the mean speech function score increased markedly after surgery, consistent with earlier findings by Witt et al., who reported that pharyngeal flap surgery leads to a significant reduction in hypernasality and speech unintelligibility, often within the first few months postoperatively. Similarly, studies have documented the role of surgical correction in facilitating better articulation and resonance, which directly correlates with improved communicative confidence[13-15].

Social integration and emotional wellbeing are often overlooked but are equally vital for children with facial and speech differences. The improvement in social interaction scores in this study suggests reduced self-consciousness and better peer relationships after surgical intervention. This was supported by the studies emphasized the positive impact of successful VPI treatment on children's ability to participate more confidently in school and social settings [16, 17]. Moreover, the rise in emotional wellbeing scores parallels studies which have shown that reducing speech-related anxiety can significantly enhance overall psychological health [18, 19].

Importantly, parental satisfaction in this study was high, with over 90% expressing satisfaction or high satisfaction with the surgical outcomes. This reflects not only the technical success of the procedure but also the perceived improvement in their children's overall development. As highlighted by studies, caregiver perspectives are a crucial component of cleft care, often influencing treatment adherence and long-term follow-up [20].

While the complication rate was low in this cohort, the presence of postoperative snoring and minor sleep disturbances in a small proportion of patients is worth noting. Previous literature, including has reported similar findings and recommended thorough preoperative airway evaluation to anticipate and manage such issues [21].

This study's strengths lie in its prospective design, standardized surgical technique, and comprehensive follow-up with validated quality of life tools. However, some limitations must be acknowledged. The study was conducted at a single center with a modest sample size, which may affect the generalizability of the findings. Additionally, long-term outcomes beyond one year were not assessed. Future research could benefit from multicenter collaboration, longer follow-up durations, and inclusion of objective speech analysis tools such as nasometry.

CONCLUSION

Pharyngeal flap surgery significantly enhances quality of life in patients with velopharyngeal insufficiency following cleft palate repair. Improvements were noted not only in speech function but also in emotional and social domains, contributing to better psychosocial development. The procedure is generally safe and well-tolerated, with high parental satisfaction. These findings reinforce the importance of early identification and timely surgical intervention for VPI as part of a multidisciplinary cleft care approach.

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