Intensive Care Unit Monitoring After Pharyngeal Flap Surgery: Is It Necessary?

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Purpose: To assess the incidence of perioperative complications and the utility of intensive care monitoring in patients undergoing posterior pharyngeal flap surgery for velopharyngeal dysfunction (VPD).

Materials and Methods: This study was a retrospective evaluation of patients who underwent posterior pharyngeal flap surgery for treatment of VPD and an assessment of the incidence of perioperative complications. Descriptive statistics were computed.

Results: Over an 18-year period, 145 patients underwent pharyngeal flap surgery for VPD; 133 (91.7%) had complete data and were included as subjects. Mean patient age was 9.4 ± 7.4 years; 50.4% were female. One hundred twenty-six patients (94.7%) had a history of cleft palate. Thirty-four patients (25.5%) had asthma or obstructive sleep apnea. Eighty-three patients (62.4%) were admitted to the intensive care unit (ICU) for postoperative monitoring. The average length of hospital stay was 1.9 ± 0.9 days (range, 1 to 5 days). There were no incidents of serious postoperative complications, including death, bleeding, flap dehiscence or loss, or airway compromise requiring reintubation. Two patients (1.5%) had perioperative complications related to respiratory issues, one of whom required readmission to the ICU (0.8%). There were no differences in complications between those who were routinely admitted to the ICU and those who went directly to the floor (P = 1.00). There was no association between respiratory comorbidities and complications (P = .06).

Conclusion: The perioperative complication rate for posterior pharyngeal flap surgery is low (<2%). Routine ICU admission for monitoring is not necessary.

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Children with velopharyngeal dysfunctions (VPD) exhibit characteristic speech pathologies, such as hypernasality, nasal emission, and articulation errors.1-17 These result from the failure of the velopharyngeal port to completely close during speech, allowing pressure waves to escape in part through the nasopharynx as opposed to the oropharyngeal route. In patients with velopharyngeal insufficiency (VPI), apposition of the velum to the posterior and lateral pharyngeal walls is not achieved because of different...
anatomic problems. Several surgical modalities, including Furlow palatoplasty, sphincter palatoplasty, and posterior pharyngeal flap procedures, have been designed to aid in velopharyngeal port closure.\(^1\)\(^6\) The choice of treatment is guided by gap size, velopharyngeal closure pattern, type of cleft, and extent of lateral wall motion.\(^1\)\(^3\)\(^5\)\(^6\)

Among the most useful procedures for VPD correction is the posterior pharyngeal flap. In this procedure, a superiorly or inferiorly based myomucosal flap is raised off of the perivertebral fascia and secured to the velum.\(^2\)\(^5\)\(^7\)\(^8\) Thus, the flap blocks the central velopharyngeal port allowing residual lateral pharyngeal wall motion to complete closure. Studies have shown that properly executed pharyngeal flap surgery can correct VPD in more than 95% of patients, with most patients achieving normal perceptual speech.\(^2\)\(^9\)\(^10\) \(^11\)\(^12\)\(^13\)\(^14\)\(^16\) However, when complications do occur in this procedure, they can be severe. These complications include ascending meningitis, life-threatening bleeding, sleep apnea, and airway compromise.\(^5\)\(^9\)\(^10\)\(^13\)\(^14\)\(^16\)

Because of the urgency of addressing these complications, some centers have recommended intensive care monitoring during the initial 24 hours after surgery.\(^16\) Others have disputed the utility of intensive monitoring, reporting a low incidence of serious complications when patients were admitted to regular pediatric inpatient units.\(^3\)\(^4\) In the era of cost containment, the additional costs of intensive care monitoring for all patients could be an unnecessary expenditure for a procedure with a low complication rate.

The purpose of this study was to review outcomes of pharyngeal flap surgery for VPI at the authors’ institution over an 18-year period, with an emphasis on immediate postoperative complications necessitating intensive care. The primary hypothesis was that intensive care monitoring would not be necessary for immediate postoperative care in this population. To address this hypothesis, the specific aims were to 1) identify a cohort of patients who underwent pharyngeal flap surgery for VPD at the authors’ institution and 2) assess the incidence of complications in the immediate postoperative period.

**Materials and Methods**

**STUDY DESIGN**

This was a retrospective evaluation of patients who underwent pharyngeal flap surgery for treatment of VPD. Patients were included as study subjects if they were treated at the senior author’s institution, had complete data on postoperative complications and care, and had complete pre-, intra-, and postoperative records. Patients who were treated at other local centers and those with incomplete records were excluded, as were those who required intensive care monitoring for other institutional protocols (eg, nursing protocols for patients with pre-existing tracheostomies and patients requiring intensive care monitoring for combined procedures, severe obstructive sleep apnea [OSA], etc). All patients included as study subjects underwent correction of VPD using a superiorly based pharyngeal flap by 1 of 3 surgeons. The setting for postoperative monitoring was based on surgeon preference. For patients admitted to the intensive care unit (ICU) postoperatively, transfer to the floor was based primarily on their ability to independently maintain airway without serious desaturations (oxygen saturation, <94%), cardiopulmonary stability, and absence of acute postoperative respiratory events. The project was approved by the institutional review board for human studies.

**STUDY VARIABLES**

Study variables were classified as predictors and outcomes. Predictor variables were factors potentially associated with a risk of adverse events in the immediate postoperative period: gender, age at surgery (years), associated syndromic diagnosis, congenital cardiac condition, neuromuscular condition, pulmonary condition (eg, OSA, asthma, or vocal cord paralysis), type of cleft (no cleft, submucous cleft palate, Veau I to IV), length of hospital stay (days), ICU admission (yes or no), and duration of ICU stay (days). Patients who were not admitted to the ICU were admitted to an inpatient floor with continuous oximetric monitoring. The primary outcome measurement was complication during the immediate postoperative period. Complications included bleeding, respiratory distress, reintubation, stridor, desaturation, flap complication, infection, or death.

**STATISTICAL ANALYSES**

Data for patients were recorded, de-identified, and entered into a statistical database (SPSS 23.0, SPSS Inc, Chicago, IL) for analysis. Descriptive statistics were computed for the study sample. Bivariate statistics and regression analyses were planned to assess risk factors for perioperative complications. For all analyses, a \(P\) value less than or equal to .05 was considered statistically significant.

**Results**

Over an 18-year period (1998 through 2015), 145 patients underwent pharyngeal flap surgery for a primary diagnosis of VPD associated with cleft palate. Of these, 133 (91.7%) had complete records and were included as study subjects. The mean patient age was 9.4 ± 7.4 years (range, 3.4 to 41.2 years).
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