Central Defect-control Pharyngeal Flap Surgery Based on Nasoendoscopic Assessment and Speech Outcomes Following Surgery

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INTRODUCTION: The main strategy behind Hogan's lateral port control pharyngeal flap surgery is to change a single central incompetent sphincter to two competent lateral sphincters. The concept of tailoring pharyngeal flaps, introduced in 1972 by Scolnick and McCall, was an improvement on existing techniques in that they varied the type of flap according to the patients lateral pharyngeal wall motion. The purpose of this study was to describe a central defect-control pharyngeal flap, as we call it, with varying width determined by preoperative nasoendoscopic findings, and assess surgical outcomes by perceptual speech evaluation and nasometric analysis.

MATERIALS AND METHODS: The authors reviewed medical records of all children who underwent a central defect-control pharyngeal flap performed by the senior author (Rong-Min Baek) from May 2008 to January 2014. 74 patients were included. Preoperative nasopharyngeal endoscopy had been performed to make a complete observation of sphincteric movement and central velopharyngeal port during speech. The unique cobblestone pattern on the posterior pharyngeal wall for each patient was used as landmarks to determine the width of flap. During surgery, watertight closure was performed at all sites to prevent scar contracture of raw surfaces. Preoperative and postoperative velopharyngeal function was assessed through perceptual speech evaluation and nasometric analysis. The correlation factors of long-term surgical outcome were analyzed.

RESULTS: 96.3 % of the patients showed velopharyngeal competency after surgery. No obstructive sleep apnea was seen. Significant improvement was observed in perceptual speech evaluation and nasometric analysis at both short term(6 months) and long term(2 years) follow-up ($p<0.001$). The preoperative size of velopharyngeal gap, the closure pattern of velopharyngeal sphincter, symmetry of lateral pharyngeal wall, the degree of hypernasality, the degree of nasal emission, the age at surgery, and the etiology of VPI did not correlate to long-term postoperative velopharyngeal function.

CONCLUSION: The central defect-control pharyngeal flap with emphasis on filling the central velopharyngeal port defect with inidividually-sized flaps, is highly successful in treating velopharyngeal insufficiency without major complications. Preoperative nasopharyngoscopy is a valuable tool in determining the size of flap. Individualized design of flap dimension, together with elimination of all raw surfaces during surgery, seems to produce adequate velopharyngeal closure that lasts over time, as demonstrated in the patients' speech evaluation and nasometric analyses.