

Inset Patterns In Sphincter Pharyngoplasty: Speech Improvement Versus Sleep Apnea Risk

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Objective

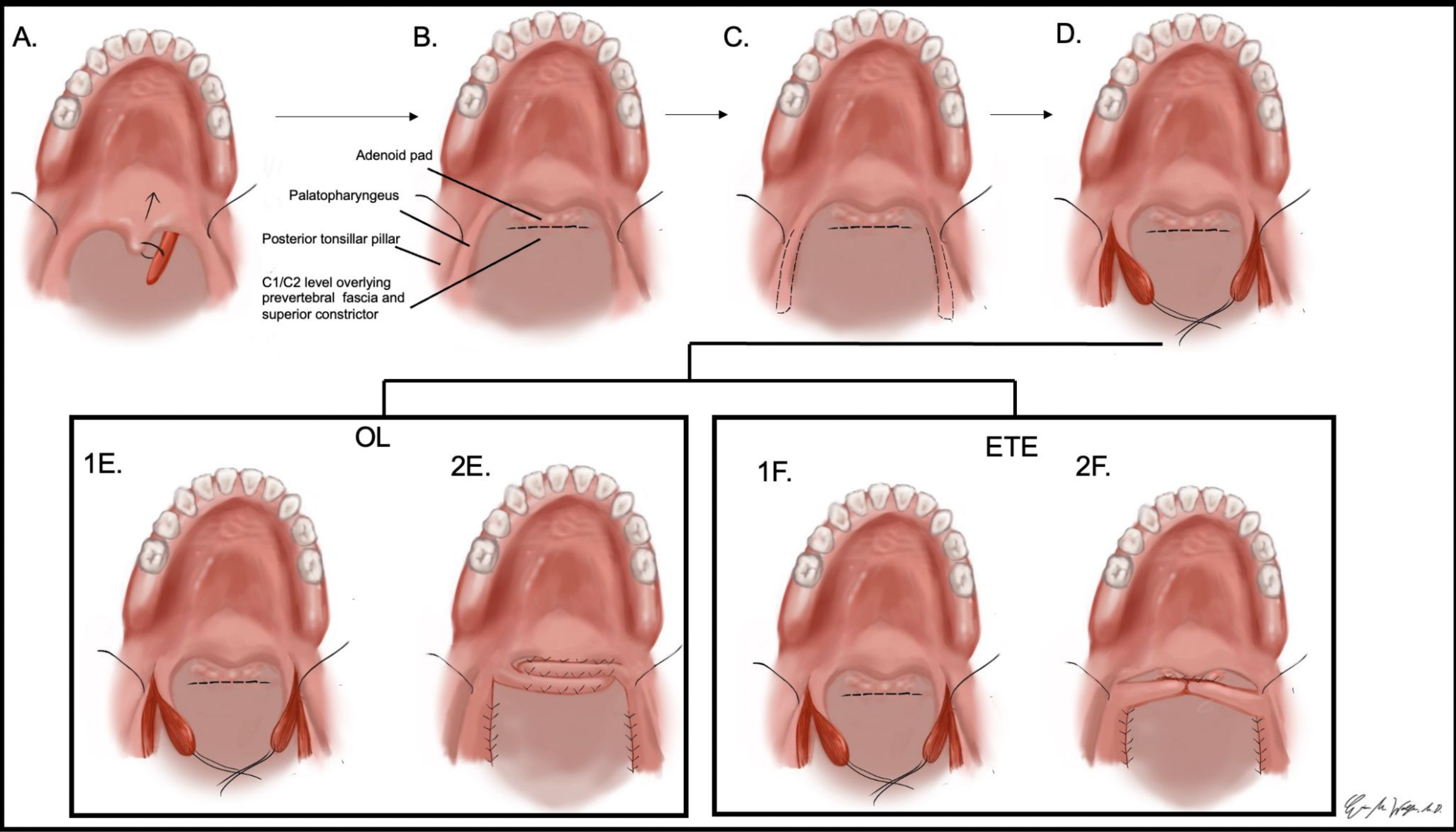
- Velopharyngeal insufficiency (VPI) is a serious and complex complication that can arise after primary palatoplasty.
- Inadequate closure of the velopharyngeal sphincter leads to nasal air emission and unintelligible speech.
- Multiple surgical approaches have been proposed for managing VPI.
- At our institution, sphincter pharyngoplasty (SP) is the preferred surgical technique.
- The impact of inset design on SP outcomes remains inadequately explored.
- This study seeks to compare the long-term outcomes of ETE versus OL inset techniques in cleft patients undergoing SP, aiming to inform clinical decision-making in the surgical management of VPI.

Methods

- Retrospective review of patients with a history of cleft palate (CP), diagnosed with VPI, who underwent SP from 2007-2023
- Excluded Robin sequence and follow-up < 1 year
- Patients matched by age, sex, comorbidity
- Variables: demographics, surgical history, SP inset pattern, intraoperative complications, speech, polysomnography
- Outcomes: speech assessment by an SLP 1 year postop
- Patients underwent clinical evaluation for obstructive sleep apnea (OSA), including polysomnography if indicated.

Figure 1. Depiction of Surgical Technique for SP.

A: Retraction of the uvula using a red rubber catheter and placement of retraction stitches to retract the posterior tonsillar pillars in preparation for the SP procedure. B: Illustration of surgical markings made at the C1/C2 level, 1-2 mm inferior to the adenoid fat pad. The prevertebral fascia and superior constrictor lay beneath the incision at this level. C: Illustration of surgical markings prior to elevation of flaps containing palatopharyngeus muscle. 1D, 1E, 1F: Elevation and mobilization of the palatopharyngeus flaps. 2E: Inset of the palatopharyngeus flaps to the posterior pharyngeal wall in an overlapping (OL) fashion. 2F: Inset of the palatopharyngeus flaps to the posterior pharyngeal wall in an end-to-end (ETE) fashion.



Results

- 90 patients underwent SP for cleft-related VPI; 48.9% had ETE inset and 51.1% had OL inset. Average age: 8.7 ± 3.9 years.
- At 1-year follow-up, the OL group had a significantly higher rate of balanced resonance (56.5% vs. 34.1%, p = 0.033).
- 87.8% of patients had articulation errors, with compensatory errors significantly higher in the ETE group (34.1% vs. 8.7%, p = 0.003).
- 27.9% of patients had OSA; the OL group had a higher AHI and risk of severe OSA (p = 0.028, p = 0.031).
- 5.6% of patients required revision surgery due to persistent VPI, with a median time to revision of 1.6 years.

Conclusions

- SP is a versatile and effective technique for managing VPI in CP patients
- Choice of inset pattern (OL vs. ETE) significantly impacts speech, OSA risk, and likelihood of compensatory speech errors, with OL inset showing better resonance outcomes
- OL inset may increase the risk of OSA and should be carefully monitored post-op
- Revision rates for SP are low, though the effect of inset pattern on revision outcomes remains unclear
- Surgeons should consider individual patient factors when selecting the appropriate inset pattern to optimize outcomes

Table 1. Clinical considerations for choice of SP inset pattern.

Overlapping	End-to-End
Skeletal class I	Skeletal class II-III
No diagnosis of or low risk for sleep apnea	Diagnosed with or at risk for sleep apnea
No mandibular hypoplasia	Mandibular hypoplasia
No craniofacial syndrome	Craniofacial syndrome
No Robin sequence	Robin sequence