

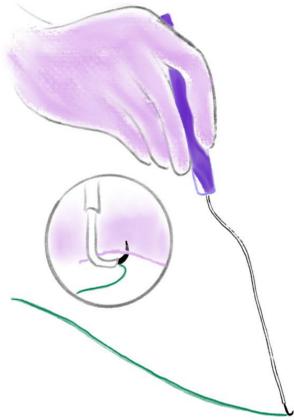
Comparison of Two Novel Techniques for Resuspension of Inverted U-shaped Nasopharyngeal Flap Following Endonasal Access to Craniovertebral junction: A Cadaveric Analysis

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BACKGROUND

- Ventral exposure of the anterior C1 ring and ventral craniocervical junction has undergone marked evolution throughout the past 30 years.
- Early reports of transnasal odontoidectomy involved resection of ventral nasopharyngeal tissue to ϵ junction.
- Procedures which necessitate proper mucosal resuspension through the long and narrow endonasal corridor remain technically challenging.
- The aim of our study is to evaluate the efficacy of two innovative suturing techniques to enhance endonasal tissue resuspension.



METHODS

- Dissections were performed in 3 cadavers.
- A partial posterior septectomy, excision of the inferior portion of the posterior nasal septum was performed. Lateral incisions in the region of the Rosenmüller fossae, extending inferiorly to the palatal structures were made. A superior incision, just below the pharyngeal tubercle, connected the lateral incisions.
- IUNF resuspension was completed in two timed trials using:
 - 1) running 3-0 Monocryl “knotless” Stratafix with loop suture in a standard fashion
 - 2) interrupted closure using the Durastat spring-loaded repair dural device.
- The timing and quality (“adequate” or “inadequate”) of both resuspension techniques was documented for comparison. Criteria for “inadequate resuspension” included evidence of gapping, ridging, or incomplete mucosal realignment.

RESULTS

- Mucosal resuspension was successfully achieved in all specimens.
- Average time required to resuspend the IUNF using the 3-0 Monocryl barbed Stratafix with loop and an endonasal needle driver was 18.59 minutes (SD \pm 8.38), compared to 18.35 minutes (SD \pm 1.82) using the Durastat system.
- Suturing of the IUNF was more technically challenging in the Stratafix cohort. In roughly one-third of the Durastat suture throws, the needle did not completely penetrate the mucosal tissue.

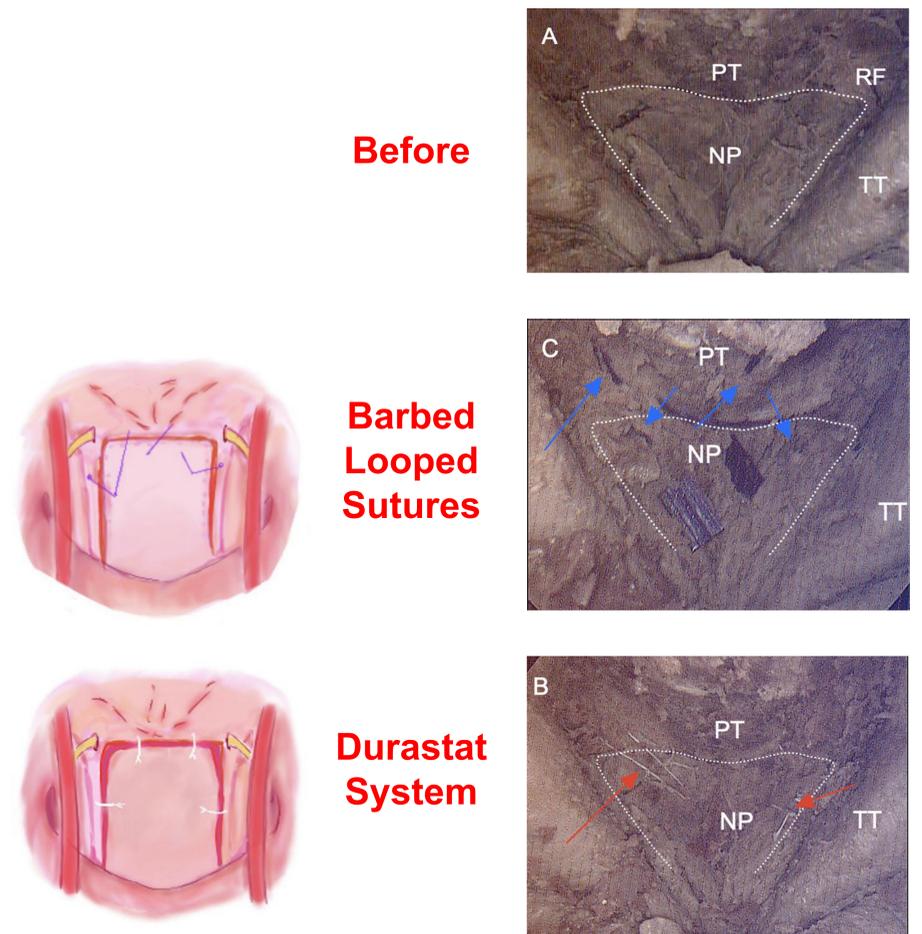
Specimen	Barbed Looped Suture (s)	Durastat System (s)
1	28.13	19.27
2	15.21	18.16
3	12.42	19.53

DISCUSSION

- Adequate mucosal resuspension was successfully achieved in all specimens.
- Barbed suture offered greater consistency with needle puncture and equivalent precision but was more technically challenging compared to the Durastat system.
- Additional research may be necessary to confirm that the Durastat spring loading mechanism consistently generates sufficient force to pierce the mucosal layer of the IUNF with a redesigned needle.
- With appropriate technological modifications, the authors believe the Durastat system has substantial future potential in IUNF resuspension.

FIGURE 1

Endonasal photographs in embalmed cadaveric specimens after IUNF creation, barbed looped sutures, and durastat system resuspension.



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