

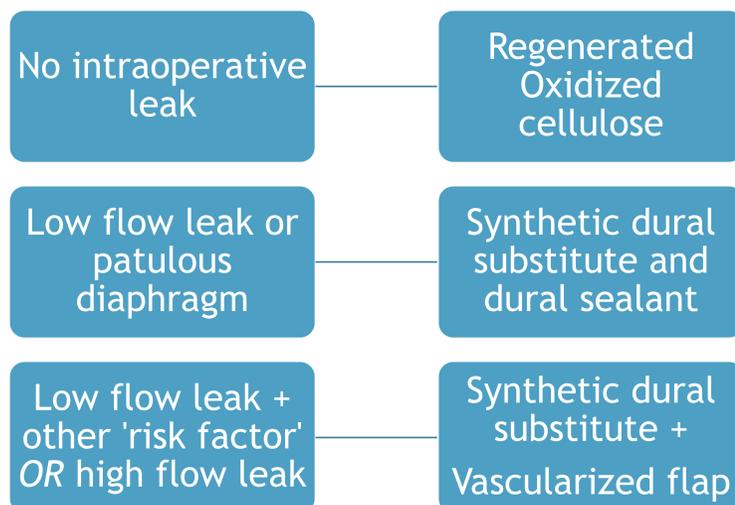
## Background

While endoscopic transsphenoidal pituitary surgery has become a widely accepted approach to sellar and parasellar pathology, there is little consensus regarding reconstruction. Many algorithms have been proposed taking into consideration intraoperative findings and patient or tumor specific features. A multitude of techniques have been proposed, ranging from no reconstruction to vascularized pedicled flaps. We review our experience and present our outcomes in 479 consecutive cases.

## Methods

A retrospective review of 479 consecutive patients who underwent endoscopic pituitary surgery for pituitary adenoma at a tertiary academic center was performed. Patient demographics, intraoperative, and postoperative data were collected. Patients were grouped based on three closure techniques: Surgicel™ with or without dural sealant (S, n=186), synthetic dural substitute with dural sealant (DS, n=267), and synthetic dural substitute with the use a vascularized flap (NSF, n=26).

## Our Approach



## Demographics

	Surgicel™ (N = 186   38.8%)	Dural Substitute (N = 267   55.7%)	Nasoseptal Flap (N = 26   5.4%)	P-value
Age	55.2 ± 15.7	54.6 ± 14.9	53.4 ± 16.1	0.823
Gender				
Male	96	138	10	0.425
Female	90	129	16	
BMI	30.6 ± 6.6	30.5 ± 6.9	32.5 ± 7.8	0.418
CPAP	17	13	3	0.132
Without comorbidity	60/186 (32.3%)	104/267 (39.0%)	8/26 (30.8%)	0.054

## Tumor Details

	Surgicel™ (N = 186)	Dural Substitute (N = 267)	Nasoseptal Flap (N = 26)	P-value
Tumor Designation				
Macroadenoma	165	255	24	0.024
Microadenoma	21	12	2	
Avg Tumor Size (cm)	2.2 ± 1.1	2.7 ± 1.1	2.3 ± 0.8	<0.001
Tumor Type				
Primary	165 (88.7%)	236 (88.4%)	21 (80.8%)	0.456
Recurrent	21	31	5	
Involvement				
Optic Nerve	95 (51.1%)	188 (70.4%)	17 (65.4%)	<0.001
Dura/bone invasion	52 (28.0%)	103 (38.6%)	11 (42.3%)	0.046
Cavernous sinus	44 (23.7%)	83 (31.1%)	11 (42.3%)	0.067

## Intraoperative Details

	Surgicel™ (N = 186)	Dural Substitute (N = 267)	Nasoseptal Flap (N = 26)	P-value
Extent of Resection				
Gross total	154 (82.8%)	236 (88.4%)	23 (88.5%)	0.223
Partial	32	31	3	
Patulous Diaphragm	0 (0.0%)	160 (60.0%)	0 (0.0%)	<0.001
Intraoperative Leak				
High flow leak	4 (2.2%)	90 (33.7%)	23 (88.5%)	<0.001
'Fishmouth' defect	0	1	3	0.015
	0	7	11	0.002

## Post-Operative Details

	Surgicel™ (N = 186)	Dural Substitute (N = 267)	Nasoseptal Flap (N = 26)	P-value
LOS (days)	2.7 ± 1.8	2.7 ± 2.2	4.4 ± 6.5	0.007
Readmit within 30d	12 (6.5%)	33 (12.4%)	5 (19.2%)	0.041
Crusting	9 (4.8%)	21 (7.9%)	16 (61.5%)	<0.001
Sinusitis tx w abx	29 (15.6%)	50 (12.4%)	11 (42.3%)	0.005
Septal perforation	3 (1.6%)	7 (2.6%)	3 (11.5%)	0.014
Sellar hemorrhage	0 (0.0%)	0 (0.0%)	1 (3.8%)	<0.001
Postoperative Leaks	2 (1.1%)	8 (3.0%)	1 (3.8%)	0.350

## Results

Average tumor size was over 2.0 cm for all groups (S=2.2±1.1, DS=2.7±1.1, NSF=2.3±0.8, p<0.001). Invasive tumors (dura and/or bone) and those tumors with involvement of the optic apparatus, were more likely to require a more involved closure (p<0.001 and p=0.046, respectively). The identification of a patulous diaphragm prompted the use of synthetic dural substitute (S=0, DS=160, NSF=0, p<0.001). Additionally, the identification of an intraoperative leak often required a more involved closure (S=4, DS=90, NSF=23; p<0.001). The presence of a high-flow leak (communication with ventricle or cistern) or a defect at the junction of anterior sellar diaphragm to the tuberculum ('fishmouth') most often prompted the addition of a nasoseptal flap (S=0, DS=1, NSF=3, p=0.015; S=0, DS=7, NSF=11, p=0.002, respectively). During the post-operative period, significant differences in complications were found for sinusitis requiring antibiotics (S=15.6%, DS=12.4%, NSF=42.3%, p=0.005), post-operative crusting (S=4.8%, DS=7.9%, NSF=61.5%, p<0.001), and septal perforation (S=1.6%, DS=2.6%, NSF=11.5%, p=0.014). There were no significant differences in post-operative CSF leak rates (S=1.1%, DS=3.0%, NSF=3.8%, p=0.535). **The overall post-operative leak rate is 2.3%.**

## Conclusions

Based on this large series, we propose the following algorithm for sellar reconstruction: Surgicel™ alone for cases without an intraoperative leak; synthetic dural substitute in the presence of a patulous diaphragm or for a low-flow intraoperative leak; and the use of a vascularized flap reserved for high-flow intraoperative leaks, 'fishmouth' defects, or other complicating comorbidities (ie. revisions, multiple sites of leak, irradiated field, severe OSA requiring early return to CPAP).