

Introduction

- Meningitis is a rare, but serious complication following pituitary adenoma (PA) resection via an endoscopic endonasal approach (EEA).
- Risk is significantly increased in the setting of a cerebrospinal fluid (CSF) leak.
- Reported postoperative CSF leak rates range from 0.6-8.7%.
- Antibiotic and nasal antiseptic protocols vary wildly across institutions.
- The benefit of routine nasal antiseptic preparation and prolonged postoperative antibiotics remains unclear.

Objective

We describe our minimal intraoperative and postoperative infection-prevention protocol and report institutional rates of iatrogenic meningitis.

Methods and Materials

- **Study Design:**
 - Retrospective review of patients undergoing EEA for functional and non-functional PAs
- **Cohort:**
 - 171 patients treated at a single institution between January 2023- December 2024
- **Data Collected:**
 - Patient demographics
 - Intraoperative course
 - Postoperative infectious complications
- **Antibiotic Prophylaxis:**
 - Single, weight-based dose of intravenous Cephazolin at surgical induction
 - No prophylactic postoperative antibiotics
- **Antiseptic Preparation:**
 - No facial or intranasal antiseptic preparation
 - Intraoperative irrigation with normal saline only (no antibiotic additives)
- **Intraoperative CSF Leak Management:**
 - Lumbar drains not routinely used

Results

- **Cohort:** 171 patients undergoing EEA for pituitary adenoma
 - 99 females (57.9%), mean age 51 years (range 21–87)
 - 72 males (42.1%), mean age 59 years (range 34–81)
- **Tumor Subtypes:**
 - Non-functioning adenoma: 74
 - Cushing's disease: 37
 - Acromegaly: 21
 - Silent ACTH adenoma: 15
 - Prolactinoma: 14
 - TSH-secreting adenoma: 2
- **Intraoperative CSF Leak:**
 - Encountered in 42 patients (24.5%)
- **Postoperative Meningitis:**
 - 2 cases (1.1%), both confirmed by lumbar puncture (Table 1)

Table 1. Postoperative meningitis case summaries.

Feature	Case 1	Case 2
Tumor Pathology	Acromegaly	Prolactinoma
Intraoperative CSF leak	Yes	No
CSF Leak Management	DuraMatrix + nasoseptal flap	-
Time to Readmission	POD14	POD5
Presenting Symptoms	Fever, altered mental status	Fever, encephalopathy
Microbiology	Escherichia coli	Staphylococcus aureus, Fusobacterium
Subsequent complications	None	CSF Leak
Subsequent Interventions	-	Surgical CSF leak repair (POD10)

Table 2. Patient demographics and tumor characteristics for each PA subtype

Characteristic	Number	%
Sex		
Male	72	42.1%
Female	99	57.9%
Age (years) (mean, range)	54 (21-87)	-
Surgical History		
First surgery	92	53.8%
Repeat surgery	79	46.2%
Pathology		
Non-functional	74	43.3%
Cushing's disease	37	21.6%
Acromegaly	22	12.9%
Silent ACTH	15	8.8%
Prolactinoma	14	8.2%
TSHoma	2	1.2%
Intraop CSF Leak?		
Yes	42	24.5%
No	129	75.4%

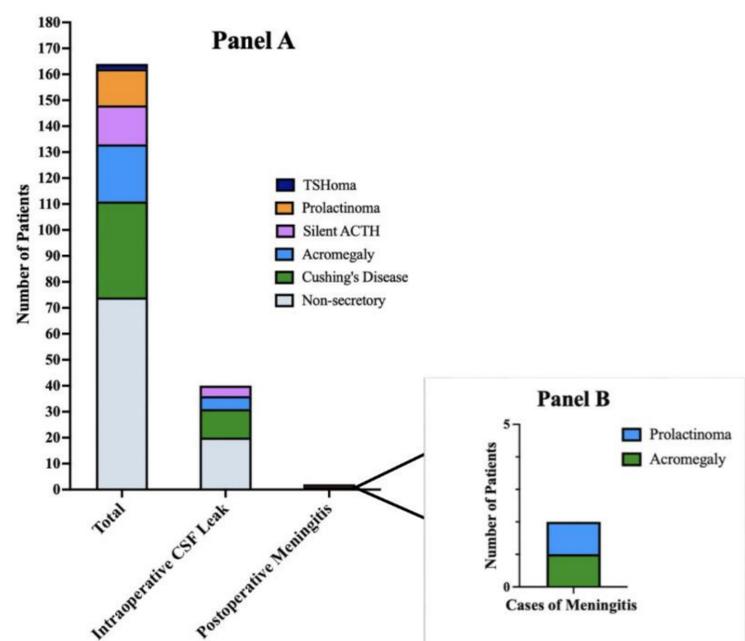


Figure 1. Population of our pituitary adenoma cohort stratified by pathology. 24.5% developed a CSF leak out of 171 total patients. One patient with prolactinoma and one patient with acromegaly developed postoperative meningitis following surgery (zoomed-in panel).

Discussion

- Substantial heterogeneity exists in perioperative antiseptic and antibiotic practices for EEA across institutions.
- We describe our institution's minimalist approach to peri-operative antiseptic and antibiotic regimens, based on current practice in standard sinus surgery.
- Our postoperative rate of meningitis was low at 1.1%, consistent with rates reported in literature.
- Our results do not suggest superiority but demonstrate that extensive prophylactic protocols may not be necessary in all cases.
- Our results support reevaluation of current protocols and encourage discussion towards evidence-based practices.

Conclusions

Our findings demonstrate an acceptably low rate of post-operative meningitis following EEA for pituitary adenomas, even in the absence of antiseptic nasal preparation and postoperative antibiotics.

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