

Litigation in Pituitary Disease and Surgery: A Detailed Review of Cases and Outcomes in the Past 40 Years

Luke Schwetschenau

Saint Louis University School of Medicine

Gabriella Boone

Saint Louis University School of Medicine

Kathleen Botterbush

Saint Louis University School of Medicine

Abhigna Chennareddy

Saint Louis University School of Medicine

Philippe Mercier

Saint Louis University School of Medicine

Tobias Mattei

tobiasmattei@gmail.com

Saint Louis University School of Medicine

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Abstract

Objective

To evaluate malpractice litigation involving pituitary disease and surgery, identify patterns in alleged diagnostic, surgical, and perioperative errors, characterize legal outcomes and damages, and define the medicolegal risk of neurosurgeons involved in skull-based procedures.

Methods

A retrospective review of malpractice claims involving pituitary disease was conducted using WestLaw and LexisNexis legal databases. Clinical and legal characteristics collected included patient demographics, practice setting, surgical details, defendant specialty, case outcome, and monetary awards. Comparisons were performed using chi-square and nonparametric statistical tests.

Results

Of 389 screened cases, 87 met the inclusion criteria, with 83 known outcomes (95%). Plaintiff outcomes occurred in 34 (41%) of cases, most commonly relating to operative or post-operative injury ($n = 47$, 54%). Among plaintiff outcomes with a reported payout ($n = 74\%$), the median, 2026-adjusted award was \$1,354,979 (range: \$309,643-\$9,767,185), with the largest unadjusted median payouts observed in pediatric cases (\$3,565,000) and failure to diagnose (\$990,824). No statistically significant differences in payout were observed by specialty or defendant composition, while case frequency varied by geographic region, practice setting, and surgical approach. Visual and endocrine injuries trended towards higher payouts.

Conclusions

Malpractice risk in pituitary disease is driven by injury severity and case complexity rather than specialty alone, with neurosurgical involvement predominating in litigation, highlighting the speciality's central role in pituitary surgery despite the multidisciplinary nature of skull-based care. Failure to diagnose carries the highest median payouts, underscoring the need for timely evaluation and improved diagnostic pathways for pituitary disease.

INTRODUCTION

Malpractice litigation remains a prominent concern in neurosurgery, which carries the highest annual claim rate of any specialty at 19.1% in addition to the highest mean inflation-adjusted payments, despite a declining rate of paid claims over recent decades.[1, 2] While prior literature has characterized neurosurgical malpractice broadly, with spinal surgery driving claim volume and cranial surgery driving per-claim award amounts, subspecialty-specific analyses remain limited.[3, 4] Among brain tumor cases, pituitary adenomas are the most commonly litigated diagnosis, yet pituitary-specific analysis is scarce; only one prior study has addressed this population, though that article combined pituitary disease with other skull base pathologies.[5–8]

Naturally, the multidisciplinary nature of pituitary care distributes a responsibility across specialties, though this further complicates liability and leaves the specific medicolegal risk profile of the involved providers poorly defined. This study aims to characterize malpractice litigation involving surgically treated pituitary disease across allegation type, outcome, and award, and to define the risk profile of neurosurgeons and other specialists in pituitary care.

METHODS

Study Design and Search Strategy

A retrospective review of medical malpractice claims was performed in the legal databases WestLaw Edge and LexisNexis on November 3, 2025, utilizing a single shared search query which can be found in **Supplemental Methods**. All search results were screened by two reviewers (G.B., K.B.) for instances of U.S.-based malpractice claims involving pituitary disease or surgery with discrepancies resolved by the senior author (T.A.M). Final review verified that all cases explicitly mentioned pituitary pathology, underwent surgical intervention during treatment and contained sufficient data for collection. Cases involving defendants other than medical providers or hospitals, not associated with a clear legal malpractice claim, duplicates, and cases unrelated to pituitary disease were excluded. This study followed STROBE [9] guidelines, did not require IRB approval, with data available upon request.

The initial legal claim search in LexisNexis and Westlaw yielded 389 total results of which 302 were excluded with 87 cases left for analysis (Fig. 1).

Case Characteristics

Plaintiff and defendant demographics, year of case closure by 5-year periods, case location by state and geographic region, [10] practice setting, surgical procedure and approach, resulting injury, and pituitary indication were collected. Legal characteristics, including defendant identity (physician, hospital, or both), case outcome (plaintiff or defendant), damages (monetary and non-monetary), and additional legal or regulatory consequences, were obtained.

Statistical Analysis

Descriptive statistics were performed; median and range were reported for numeric variables, whereas frequency and percentage were provided for categorical parameters. Monetary values were adjusted to 2026 dollars using the Bureau of Labor Statistics Consumer Price Index calculator where indicated.[11] Comparisons of payouts by plaintiff age, practice setting, defendant type, lawsuit allegation, and outcome type were performed using the Mann-Whitney U and Kruskal-Wallis tests, given the non-normal distribution and right skew of malpractice award data. Incidence rates before and after 2010 were compared using an exact Poisson test for two incidence rates, with calendar years in each period used as the exposure time, and incidence rate ratios with 95% confidence intervals reported. Statistical significance was set at $p < 0.05$ and reported for all comparisons. Descriptive data were analyzed using Microsoft Excel.

RESULTS

Temporal/Regional Characteristics and Plaintiff Demographics

A summary of qualitative characteristics can be found in Table 1 with quantitative characteristics found in Table 2. A distribution of 5-year-grouped malpractice claims is presented in Fig. 2. Cases spanned from 1983 to 2019, with year of malpractice event known in 45 cases (52%). Among these, 41 occurred before 2010 (1983–2009), while 4 occurred after (2010–2017). The rate of incidence was significantly lower after 2010 than before, decreasing from 1.52 to 0.50 events per year (IRR: 0.33; 95% CI 0.09–0.91; $p=.018$).

Table 1
Qualitative characteristics of all legal claims involving pituitary disease. Note:
Sub-categorization proportions are calculated from the numerical, bolded
headings above.

Date of Alleged Injury	Number Known (#), Proportion (%)
	45 (52)
Before 2010	41 (91)
After 2010	4 (9)
Patient Age	42 (48)
Under 18	6 (14)
Over 18	36 (86)
Regional Distribution	87 (100)
West	14 (16)
Midwest	18 (21)
Northeast	28 (32)
South	27 (31)
Defendant Type	81 (93)
Physician	56 (69)
Hospital	7 (9)
Both	18 (22)
Outcome	83 (95)
Plaintiff	34 (41)
Defendant	49 (59)
Final Resolution	78 (90)
Settlement	22 (28)
Verdict	51 (65)
Dismissal	5 (6)
Monetary Award	25 (29)
Above \$1,000,000	9 (36)
Below \$1,000,000	16 (64)
Practice Setting	78 (90)
Academic	36 (46)
Non-Academic	42 (54)
Allegation Category	87 (100)
Failure to Diagnose	35 (40)
Pre-operative Complication	5 (6)

Date of Alleged Injury	Number Known (#), Proportion (%)
	45 (52)
Operative Complication	20 (23)
Post-operative Complication	27 (31)
Additional Injury	75 (86), 117 injuries total
Visual Injury	29 (25)
Endocrine/Pituitary Dysfunction	18 (15)
Death	17 (15)
Non-visual Neurologic Injury	13 (11)
Cerebrovascular/Vascular Injury	11 (9)
Pain & Decreased Quality of Life	8 (7)
Infectious-related	5 (4)
CSF-related	3 (3)
Other	13 (11)
Specialty of Defendant	75/80 applicable (94), 89 total specialties
Neurosurgery	40 (45)
Internal Medicine	8 (9)
Ophthalmology	8 (9)
Otolaryngology	6 (7)
Radiology	6 (7)
Other	31 (35)
Surgical Indication	84 (97)
Unspecified Tumor	42 (50)
Adenoma	24 (29)
Craniopharyngioma	6 (7)
Apoplexy	3 (4)
Other	9 (11)
Specialties Involved	75/80 applicable (94)
Single Specialty	64 (85)
Multiple Specialties	11 (15)
Surgical Approach	23/52 surgical cases (56)
Transsphenoidal	17 (74)
Craniotomy	4 (17)
Other	2 (9)

Table 2
Quantitative Legal Characteristics of Pituitary-Related Malpractice Claims

Characteristic	Median (Range)
Age of defendant, years	44 (2 mos-76 yrs)
Time from alleged incident to claim closure, days	1837.5 (590–5110)
Award, 2026 inflation adjusted \$	\$1,354,979 (\$309,643-\$9,767,185)
Settlement award, \$	\$775,000 (\$175,000-\$6,500,000)
Verdict award, \$	\$600,000 (\$250,000-\$2,630,000)
Under 18 years old award, \$	\$3,565,000 (\$1,200,000-\$6,500,000)
Over 18 years old award, \$	\$500,000 (\$175,000-\$2,500,000)
Non-academic setting award, \$	\$1,200,000 (\$230,000-\$2,630,000)
Academic setting award, \$	\$800,000 (\$500,000-\$6,500,000)
Single specialty defendant, \$	\$600,000 (\$175,000-\$6,500,000)
Multi-specialty defendant, \$	\$2,000,000 (\$350,000-\$2,500,000)
Neurosurgery defendant, \$	\$534,000 (\$175,000-\$1,750,000)
Internal Medicine defendant, \$	\$428,500 (\$230,000-\$1,419,150)
Ophthalmology defendant, \$	\$475,000 (\$250,000–1,200,000)
Otolaryngology defendant, \$	\$2,000,000 (\$2,000,000)
Family Medicine defendant, \$	\$1,915,000 (\$1,200,000-\$2,630,000)
Radiology defendant, \$	\$2,250,000 (\$990,824.38-\$4,500,000)
Physician-only defendant, \$	\$845,412 (\$230,000-\$6,500,000)
Hospital-only defendant, \$	\$675,000 (\$600,000-\$750,000)
Combined defendant, \$	\$600,000 (\$175,000-\$2,500,000)
Failure to diagnose claim, \$	\$990,824 (\$230,000-\$6,500,000)
Pre-operative claim, \$	\$1,419,150 (\$1,419,150)
Operative claim, \$	\$500,000 (\$175,000–1,750,000)
Post-operative claim, \$	\$600,000 (\$534,000-\$850,000)
Visual injury, \$	\$750,000 (\$250,000-\$4,500,000)
Endocrine injury, \$	\$853,500 (\$175,000-\$6,500,000)
Death, \$	\$550,000 (\$325,000-\$1,750,000)
Non-visual neurologic injury, \$	\$2,630,000 (\$600,000-\$4,500,000)
Transsphenoidal approach, \$	\$462,500 (\$325,000-\$600,000)

The Northeast was the most litigious region (28 of 87, 32%), followed by the South (27, 31%), Midwest (18, 21%), and West (14, 16%). New York (16), California (10), and Pennsylvania (7) reported the highest absolute number of cases (Fig. 3). Mean time to case resolution was 2,130 days (approximately 5.8 years), similar to previously reported averages for malpractice claims.[12, 13]

The mean plaintiff age was 43.6 years. Male plaintiffs were more common (39 of 87, 45%) than female (36, 41%) with 12 cases (14%) having unknown gender. Pediatric cases comprised 7% (6) of the cohort. Pituitary adenoma was the most common indication, with other indications including apoplexy, cysts, and miscellaneous pathologies (Table 1).

Case Outcomes

Of 83 cases with known outcomes, 34 (41%) resulted in plaintiff outcomes, with 49 (59%) in favor of the defendant. Among 78 cases with known disposition, verdict (51, 65%) was most common, followed by settlement (22, 28%) and dismissal (5, 6%). Among 34 plaintiff outcomes with known disposition, settlement (23) was more common than verdict (11).

Payout Characteristics

Among the 25 cases with plaintiff outcome and known payout, the median-inflation adjusted award was \$1,354,979 (mean: \$2,199,492; range: \$309,643-\$9,767,185) with unadjusted settlements (14, \$775,000) exceeding that of verdicts (11, \$600,000) though not statistically significant ($p=.40$) (Table 2). Of the 17 cases with known age and payout, pediatric cases demonstrated significantly higher median payouts (4, \$3,565,000) when compared to adult cases (13, \$500,000) ($p=.003$). No statistically significant difference in median payout was observed between physician-only (14, \$845,412), hospital-only (2, \$675,000), and combined defendant cases (7, \$600,000; $p=.90$). Details of the five cases with the highest payouts can be seen in Table 3 while the five cases with the highest payouts relating to surgical intervention can be seen in **Table 4**.

Table 3. Top 5 pituitary-related malpractice cases with the highest award payouts.

Case	Case #1 ^a	Case #2 ^b	Case #3 ^c	Case #4 ^d	Case #5 ^e
Year of Resolution	2015	1996	2015	2012	2013
State	NY	NY	NY	NJ	PA
Legal outcome	Settlement	Settlement	Verdict	Verdict	Settlement
Award payout	\$6,500,000	\$4,500,000	\$2,630,000	\$2,500,000	\$2,000,000
Defendant	Physician	Physician	Physician	Physician & Hospital	Physician
Plaintiff age	<18	2 months	13	54	Unknown
Practice Setting	Academic	Academic	Non-academic	Academic	Non-academic
Named Specialty(s)	Pediatrics	Radiology	Family Medicine	Radiology, Emergency Medicine	Otolaryngology, Radiology
Reason for Lawsuit	Failure to Diagnose	Failure to Diagnose	Failure to Diagnose	Failure to Diagnose	Failure to Diagnose
Surgical Indication	Craniopharyngioma	Craniopharyngioma	'Tumor'	Macroadenoma	Adenoma
Case summary	A child followed up with their pediatrician's office for five well-child examinations across a 2.5-year period with complaints of excessive thirst, altered growth, and head circumference abnormalities. After finally presenting with severe headache, nausea, vomiting, and lethargy, the child was sent to the emergency department and diagnosed with obstructive hydrocephalus secondary to a craniopharyngioma. As a result, the plaintiff's family cited that the untimely detection of the child's tumor, which would have been prevented with early referral to a subspecialist, led to the inability to fully resect the tumor, tumor recurrence, further	At birth, the plaintiff's bloodwork was notable for abnormal thyroid hormone level, for which they were referred to an endocrinologist. From the age of 2 months to 2 years, the plaintiff was worked up for additional hormone deficiencies. As part of this, patient underwent a CT scan, which was read by a second-year radiology resident as 'normal' despite plaintiff's argument that the CT scan showed evidence of a craniopharyngioma. Additionally, the plaintiff argued that the resident-physician interpreted the scan without review from an attending physician. Over the next several years, plaintiff eventually developed vision problems, for which	13-year-old plaintiff presented to family physician with complaints of excessive thirst, urination, and mood changes and subsequently diagnosed with a psychological disorder without additional follow-up testing. 3 years later, at the onset of severe headaches, the plaintiff underwent an MRI that detected a benign pituitary tumor. The plaintiff argued that, due to the delay in diagnosis, he suffered permanent	A 54-year-old presented to an emergency department with complaints of severe headache and double vision for which he received a CT scan with a read evident for 'sinusitis' though no MRI was ordered. The read was then reviewed by an attending physician with concern for a possible tumor, though the emergency physician had discharged the patient with a referral to ENT before the change in read, with the change never communicated to the patient. The patient subsequently developed loss of vision in his left eye and was	Plaintiff presented to ENT with complaints of migraines and sinus problems for which he received a CT scan. This scan was read as 'normal' though plaintiff argues that a mass within the sella and right cavernous sinus was visible on the CT scans. The 'normal' results were communicated to the plaintiff by the ENT physician. Two years later he presented to a neurologist with complaints of similar headaches and was diagnosed with a suprasellar/intrasellar mass via MRI. Plaintiff underwent surgical removal in which 50% of the tumor was unable to be removed and the patient lost vision in his right eye as a complication of surgery.

surgeries, and permanent cognitive, motor, and physical delays. The defendants argued that an earlier diagnosis would not have averted the above damages.

an MRI was ordered that showed a craniopharyngioma. The case was settled during trial.

changes to his sleep, memory, concentration, and mood leading to continued difficulty in school and life.

eventually diagnosed with a pituitary macroadenoma. He suffered permanent loss of vision.

a – Pippin vs. Lee, et al... Index no. 4866/10, 10-00-15. Attorney for plaintiff: William T. Burdo of Mineola, of counsel to of Levine & Grossman in Mineola, NY.

b – Luis Ramirez, inf. by his m/n/g Mildred Deodato v. Charles Sklar, M.D.; R. Speirs, M.D.; Joseph Lin; 1996 Jury Verdicts LEXIS 63457

c – Voll vs. Piela; 2017 Jury Verdicts LEXIS 88476

d – Keith Kulper and Denise Kulper v. Jeanne Schwartz M.D., Morris Imaging Associates, Brian Walsh M.D., Emergency Medical Associates, Morristown Memorial Hospital and Atlantic Health System; 2012 Jury Verdicts LEXIS 6595

e - Alexander Cole v. Thomas M. Niedbala, M.D., South Jersey Radiology Associates, P.A., John W. McGrath, D.O., and Vernose & McGrath Otolaryngology Associates, P.C; 2013 Jury Verdicts LEXIS 13595

Table 4. Top 5 pituitary-related malpractice cases related to surgical intervention with the highest award payouts.

Case	Case #1^a	Case #2^b	Case #3^c	Case #4^d	Case #5^e
Year of Resolution	2019	2010	2008	2010	2008
State	PA	MI	VA	MA	PA
Legal outcome	Settlement	Verdict	Settlement	Settlement	Verdict
Award payout	\$1,750,000	\$1,419,150	\$850,000	\$700,000	\$600,000
Defendant	Physician & Hospital	Physician & Hospital	Unknown	Physician	Hospital
Plaintiff age	Unknown	49	Unknown	30s	Unknown
Practice Setting	Non-academic	Academic	Academic	Unknown	Academic
Named Specialty(s)	Neurosurgery	Internal Medicine	Unknown	Neurosurgery	-
Surgical Indication	Macroadenoma	Apoplexy	Adenoma	Unknown	'Tumor'

Case summary	Plaintiff was evaluated by defendant surgeon for the presence of a pituitary macroadenoma which caused the plaintiff to experience pressure behind the eye, decreased vision, and difficulty finding words. The patient was scheduled for surgery and underwent workup which was notable for elevated prolactin levels with otherwise normal endocrine function. Plaintiff argues that this indicated the use of bromocriptine rather than surgical intervention, where she subsequently sustained a subarachnoid hemorrhage secondary to Percheron artery damage. Following surgery, the patient passed away. The plaintiff's estate argues that the surgery was not indicated and subjected the plaintiff to serious personal injury and death. The case was settled out of court.	Plaintiff presented to medical center with signs and symptoms of a pituitary mass for which he received a CT and MRI scan that confirmed the mass. While admitted to the hospital, the patient's vision and endocrine function acutely declined for which he underwent emergent surgery for pituitary apoplexy. During surgery, it was discovered that the tumor had bled into the pituitary region of the patient's brain. Plaintiff remained in a coma following surgery and died several months later without improvement in his condition. The plaintiff alleged that the decedent's brain tumor was not correctly treated and that the 3-day delay in referral to subspecialist while hospitalized led the decedent's condition.	Plaintiff's decedent present for inferior petrosal sinus sampling to differentiate between Cushing's disease and a pituitary mass. During the course of the surgical procedure, a pituitary tumor was discovered as cause for the decedent's Cushing symptoms for which surgical resection was scheduled the next week. However, immediately following surgery, the decedent developed severe back pain, shortness of breath, tachycardia, and severe hypertension. The patient passed away after suffering a cardiac arrest due to hypovolemia related to supra-therapeutic anticoagulation post-operatively.	A female plaintiff in her 30s was under the care of defendant neurosurgeon for several years due to a history of a benign brain tumor. The plaintiff, 9 years after the tumor was diagnosed, presented to the emergency department with symptoms consistent with a multiple sclerosis event for which an MRI was obtained that confirmed lesion's suggestive of multiple sclerosis. 2 years later, the patient presented to the defendant neurosurgeon with blurry vision. Repeat MRI disclosed similar lesions, though defendant neurosurgeon attributed symptoms to pituitary tumor, for which the patient underwent surgical resection without improvement. The plaintiff alleged unnecessary surgical intervention with damage to pituitary gland.	Plaintiff's decedent was admitted to defendant hospital for treatment and surgical removal of a pituitary tumor. As part of his removal, he developed a cerebrospinal fluid leak for which a second surgery was performed. Following this surgery and discharge, the plaintiff's decedent had respiratory distress at home. The hospital's physicians failed to return calls prior to the decedent's death from a pulmonary embolism. The plaintiff's estate alleged that the decedent was negligently discharged without proper testing and that they failed to provide the proper standard of care.
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a – The Estate of Jill Briggs vs. Peter LeRoux, M.D. and Mainline Hospitals Inc. dba Lankenau Hospital; 2019 Jury Verdicts LEXIS 146366

b – Chester L. Woodard v. William Lawrence Howard, Dhana Day Shrestha and Bay Area Health Clinic; 2010 Jury Verdicts LEXIS 33682

c – Confidential; 2015 Dolan Media Jury Verdicts LEXIS 10717

d – Plaintiff vs. Defendant neurosurgeon; 2011 Jury Verdicts LEXIS 267728

e - DUNCAN, ESTATE OF v. UNIVERSITY OF PENNSYLVANIA MEDICAL CENTER, JVR No. 1011190018

Allegation Profile

The most common allegation category was failure to diagnose (35 of 87, 40%), followed by post-operative (27, 31%), operative (20, 23%), and pre-operative (5, 6%) complications. Combined operative and post-operative allegations accounted for 54% of cases (**Table 1**). Among failure to diagnose claims, the most common causes included failure to diagnose from symptoms (7) and misinterpretation of imaging (5). Fifteen cases had unknown specific cause. Among operative complications, the most common allegation included vascular injury/bleeding (11 of 20), ischemic/stroke-related injury (5), and non-visual neurologic injury (4). Among post-operative complications, tumor recurrence/persistence (11 of 27), visual injury (5), infectious complications (3), and CSF-related complications were most commonly cited.

Failure to diagnose held the highest median payout (15 with known payout, \$990,824), exceeding both post-operative (4, \$600,000) and operative (5, \$500,000) allegations. The pre-operative allegation category included a single known case with known payout of \$1,419,150.

Defendant Specialty

Neurosurgery was the most frequently named specialty (40 of 89 named specialties, 45%), followed by internal medicine (8, 9%), ophthalmology (8, 9%), otolaryngology (6, 7%), radiology (6, 7%), and other (31, 35%). Five cases had an unknown specialty (**Table 1**). Neurosurgery was implicated in 80% of operative (16 of 20) and 78% of post-operative complication cases (21 of 27). Neurosurgery was rarely a primary defendant in failure to diagnose claims, which were predominantly attributed to non-surgical specialties.

Despite having the highest claim volume, neurosurgery had a moderate median payout (7 cases with known payout, \$534,000) when compared to other specialties like otolaryngology (1, \$2,000,000), internal medicine (4, \$428,500), ophthalmology (4, \$475,000), and family medicine (2, \$1,915,000). Radiology-related cases (4 with known payout) demonstrated the highest median payouts at \$2,250,000, concentrated within the high-award failure to diagnose category. Cases involving two or more specialties as defendant (22 of 87) had a higher median payout (3 with known payout, \$2,000,000) than cases with a single specialty as defendant (19, \$600,000), though this difference was not statistically significant ($p=.21$).

Injury Profile

Visual injury was the most frequently cited additional injury class (29 of 117 total classified injuries, 25%), followed by endocrine/pituitary dysfunction (18, 15%), death (17, 15%), non-visual neurologic deficit (13, 11%), cerebrovascular injury/hemorrhage (11, 9%), among others including but not limited to pain, infection, and CSF-related injuries (29, 25%). Twelve cases held unknown injury classification. Visual injuries held a median payout of \$750,000 (11 cases with known payout, range: \$250,000 - \$4,500,000), while endocrine injuries held median payouts of \$853,500 (6 cases with known payout, range: \$175,000 - \$6,500,000). Cases involving death demonstrated lower median payouts (6 cases with known payout, \$550,000, range: \$325,000 - \$1,750,000), while cases involving non-visual neurologic loss resulted in the highest median payouts (3 known cases, \$2,630,000, range: \$600,000 - \$4,500,000).

Practice Setting and Surgical Approach

Academic centers accounted for 36 cases (46%) while non-academic centers accounted for 42 (54%). Practice setting was unknown in 9 cases (10%). The median payout was lower for cases involving academic center (\$800,000) than those involving non-academic practices (\$1,200,000). This difference was not statistically significant ($p=.24$).

Among the 52 surgically related cases, surgical approach was identified in 23. Transsphenoidal was the most common approach (17 of 23, 74%), followed by craniotomy (4, 17%) and other approaches including sampling procedures (2, 9%). The median payout for transsphenoidal cases was \$462,500 (2 with known payout). No statistical comparison was performed due to the small subgroup size.

DISCUSSION

Temporal and Regional Trend

Cases spanned 1983 to 2019, with a statistically significant decline in malpractice event rate after 2010 when compared to the prior period (1.52 vs. 0.50 cases/year, $p=.018$), which we used to represent the midpoint of Endoscopic Skull Base Surgery credentialing era[14, 15]. However, this likely reflects delayed case resolution and underrepresentation of recently filed claims rather than a true decline in litigation, a limitation routinely identified in literature using legal databases.[16, 17] Thus, the effects of endoscopic skull base credentialing (2009–2012) on medicolegal risk remains unclear.

Geographically, the Northeast was the most litigious region, while New York, California, and Pennsylvania reported the highest number of cases by state. These patterns loosely reflect the regional population densities, concentration of high-volume neurosurgical centers,[18, 19] and state-level tort environments lacking statutory caps.[20, 21]

Plaintiff Outcomes and Case Resolution

The 41% of cases with a plaintiff outcome surpass both medical malpractice claims overall (22%), and within neurosurgery (17.7–27.1%). [2, 3] Among brain tumor litigation, combined plaintiff outcome rates of up to 53% have been reported.[6] Thus, pituitary litigation may represent an intermediate to high risk category of neurosurgical practice. Increased plaintiff success when compared to general malpractice claims likely reflects several factors, including anatomical complexity, proximity to vital neurovascular structures, heightened potential for catastrophic and permanent injury, and a multidisciplinary nature of care where claim fault may be more easily attributable to a specific provider or service.

Defendant verdicts were more common (59%), while settlements accounted for the majority of paid cases. Interestingly, median settlement payouts (\$775,000) exceeded the median verdict payouts (\$600,000). This contrasts with current neurosurgical literature, which cites jury verdicts as generating higher awards than settlements.[22–24] This may reflect preferential settlement of cases with a stronger argument of negligence, particularly for cases involving injuries like blindness or overt endocrine dysfunction, while weaker cases may more often proceed to trial and ultimately favor the defense. in defendant verdicts.

Allegation Profile and Distribution of Risk

Failure to diagnose was the most common allegation at 40%, followed by post-operative injury (31%), operative (23%) and pre-operative (6%) complications. Combined operative categories accounted for 54% of cases. The failure to diagnose rate falls between those reported for brain tumor litigation overall (28%)[5] and meningioma-specific litigation (68%)[7], suggesting an intermediate risk of diagnostic failure. The diagnostic complexity of non-specific presenting symptoms (headache, fatigue, and visual change) combined with the significant procedural risks of skull base surgery, may contribute to this elevated rate.

In our cohort, neurosurgery was rarely implicated in diagnostic failure (3% of failure to diagnose cases), though was named in 80% of operative complication cases, underscoring that the distribution of medicolegal risk follows the phases of care.

Payout Patterns

Failure to diagnose generated the highest median payouts (\$990,824), exceeding both post-operative (\$600,000) and operative (\$500,000) allegations. This pattern differs from current neurosurgical literature, which routinely cites improper surgical performance or technique as generating the highest total awards.[25, 26] Our findings more closely resemble data that encompasses all-specialty litigation, where diagnostic errors are both the leading claim type and account for the highest proportion of total payments.[27] The median payout for diagnostic failure (\$990,824) surpasses the National Practitioner Data Bank's all-specialty diagnostic error mean of \$386,849, but falls below brain-tumor specific averages.[6, 27] This intermediate position likely reflects the downstream consequences of delayed pituitary diagnosis, as they may result in more advanced impairment, generating substantial long term damages. In contrast, intraoperative complications may be viewed as recognized surgical risks disclosed during the informed consent process, which may limit liability.

Consistent with our findings, Steele et al identified delayed diagnosis as the leading cause of damages in neurosurgery.[28] Diagnostic errors may carry greater financial risk due to the increased morbidity represented by permanent, though often viewed as preventable, injury.

Injury Profile

Vision loss was the most frequent injury (29, 33%). While vision loss is relatively rare (post-operative incidence of 2–5%),[29] its prominence in this cohort suggests a high likelihood to result in litigation when it does occur. This is consistent with the broader principle that injury severity and permanence are major drivers of malpractice claims.

Endocrine dysfunction (18, 21%) was the second most common injury, consistent with its high reported incidence rate following pituitary surgery (5–15%).[30] The lifelong disability and sustained economic and quality of life loss associated with visual loss or endocrine dysfunction may contribute to higher payouts. Cases involving permanent, non-fatal disability may generate higher awards than death or stroke, as ongoing care needs and loss of future earnings provide compounding financial claims, an insight demonstrated broadly in malpractice literature.[6, 31]

Specialty-Specific Trends

Neurosurgery as the most frequently named specialty is consistent with prior studies on brain tumor litigation.[5, 6] Despite the highest claim volume, neurosurgery demonstrated a moderate level of average payout (\$654,857) when compared to other specialties. This may be due to the diverse distribution of allegation types, ranging from high-award failure to diagnose cases to lower-award operative and post-operative cases. This is nonetheless higher than reported averages for neurosurgery overall (\$400,000 across multiple database analyses).[32, 33]

Radiology, while less frequently named, demonstrated the highest average payouts among specialties. Published literature reports mean malpractice payouts for neuroradiology-specific claims in excess of \$2.8 million,[34] above the radiology payout average of \$481,000.[35] These findings suggest that radiologists and other diagnostic specialties may face disproportionate high per-claim financial risk despite having a lower claim volume, while, in contrast, neurosurgery bears the greatest overall liability exposure because of high claim volume.

Pediatric Claims

Pediatric cases (6) demonstrated substantially higher median payouts (\$3,565,000) compared to adults (\$500,000), consistent with prior literature on pediatric neurosurgical litigation[24, 33] and medicolegal litigation, in general.[36–38] In pituitary disease, pediatric injuries may include lifelong endocrine dysfunction, visual impairment, or neurocognitive effects, all of which further amplify economic damages by extending the period of lost earnings and care needed over a longer projected lifespan.

Clinical Implications

Failure to diagnose as the most common and highest-payout category underscores the importance of timely evaluation of patients with symptoms suggestive of pituitary pathology, clear documentation of clinical decision-making and diagnostic workflow, and effective communication among providers.

Neurosurgeons seem to bear primary medicolegal responsibility for operative and post-operative complications, underscoring the importance of the informed consent process. The elevated plaintiff-favorable outcome rate and high median payouts also suggest that pituitary surgery is a high-risk litigative domain within neurosurgery. Surgeons and institutions should consider this profile when developing malpractice coverage and risk mitigation strategies.

Limitations

This study has several limitations. Westlaw Edge and LexisNexis do not capture cases dismissed or settled outside of court, which constitute most medical malpractice claims. As such, the 87 identified cases likely represent a fraction of total

pituitary-related claims filed over the study period and may overrepresent cases that proceeded to trial or generated sufficient documentation for inclusion. Payout data were available in only 74% of plaintiff outcomes, introducing potential selection bias. Data on surgical approach and patient age was incomplete, limiting subgroup analysis. Finally, the retrospective design and small sample size limit statistical power and preclude causal inference. Despite these constraints, this study represents the most comprehensive analysis of pituitary-specific litigation in the United States.

CONCLUSION

Malpractice litigation involving pituitary disease and surgery is characterized by high rates of plaintiff-favorable outcomes, substantial financial awards, and a dual risk profile driven by diagnostic failure and procedural complications. Failure to diagnose carried the highest median award, and visual and endocrine injuries dominated the injury landscape, reflecting anatomical complexity and the permanent, documentable nature of injury. Neurosurgery bears the greatest claim burden while radiology carries the highest per-claim financial risk. Pediatric cases generate significantly higher awards. These findings highlight the importance of timely diagnostic evaluation, comprehensive informed consent, meticulous documentation, and structured multidisciplinary communication in the management of risk in pituitary disease and surgery.

Statements and Declarations

Abbreviations: None

Clinical Trial Number: Not applicable

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Figures

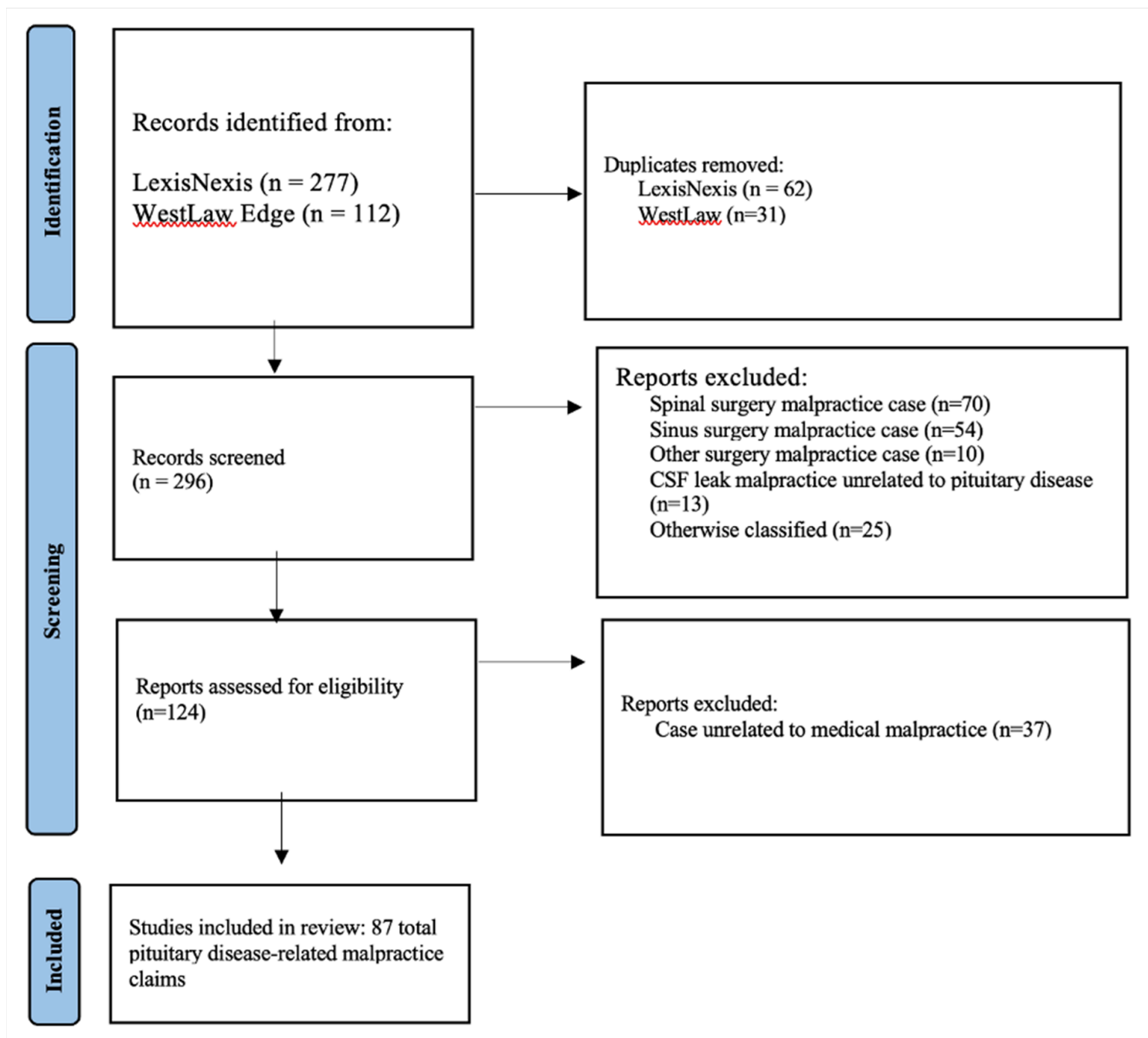


Figure 1

Study flowsheet

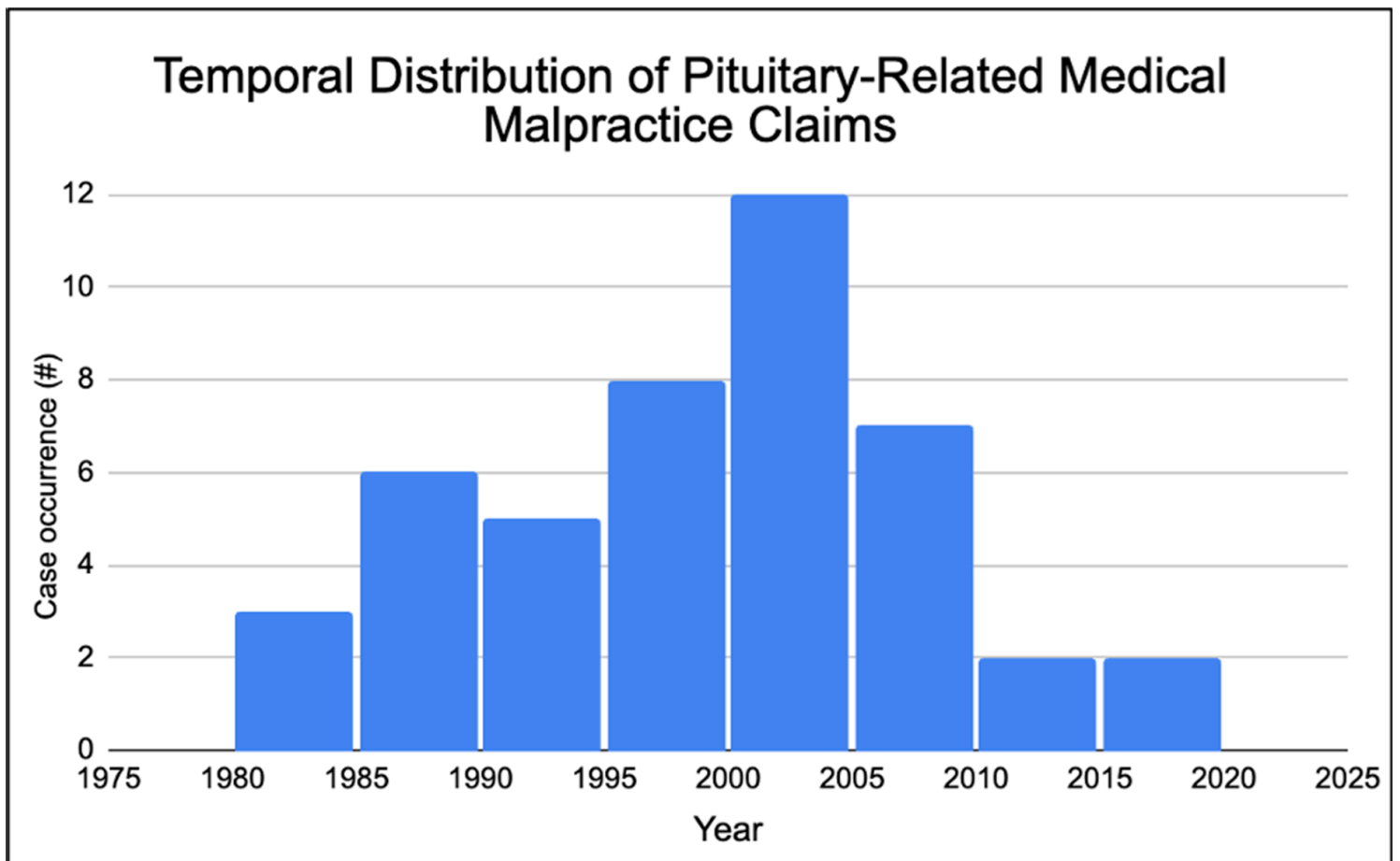


Figure 2

Temporal distribution of pituitary-related medical malpractice claims. There was no statistically significant difference in the claim per year rate before or after 2010, which serves to represent the midpoint of Endoscopic Skull Base Surgery credentialing (IRR: 0.33; 95% CI 0.09-0.91; $p=.018$).



Supplementary Files

- SupplementalMethods.docx