

# Medical Malpractice and Trigeminal Neuralgia: An Analysis of 49 Cases



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**Purpose:** Our study fills the vacancy of litigation research related to trigeminal neuralgia management, giving health care providers the information needed to understand the potential litigious outcomes that follow treatment methods.

**Methods:** We queried the Westlaw database to identify litigation cases related to trigeminal neuralgia management. Key variables extracted included medical complaints, trial outcomes, and demographics. Continuous variables were compared between cases in favor of defendant and cases in favor of plaintiff using t-test or Wilcoxon rank sum test. Categorical variables were compared using  $\chi^2$  or Fisher exact test.

**Results:** About 49 cases met the inclusion criteria—for those cases surgical complications (42.9%) were cited as the most common reasons for malpractice claims. Cranial nerve deficits (34.7%) were the most frequent postoperative complaints. Verdicts ruled in favor of the plaintiff in 26.5% of cases with a mean payout of \$1,982,428.46. Dentists were included in the most cases, 63.3%, and the average payout was \$415,908, whereas neurosurgeons were involved in 20.4% of cases with an average payout of \$618,775. Cases with verdicts in favor of the plaintiff were more likely to be older than cases with verdicts in favor of the defendant ( $P = .03$ ).

**Conclusions:** Over one-half of cases resulted in verdicts in favor of the defendant with surgical complications cited as the most common reason for litigation. Dentistry was the most common individual clinical specialty for defendants, whereas neurosurgery contributed to the largest average payout based on specialty (for  $n > 1$ ). Cranial nerve deficits were the most common plaintiff postoperative complaints. These analyses may help doctor teams involved in management of trigeminal neuralgia to have a more informed discussion with the patient at every visit so that such litigations may be avoided.

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## Introduction

Patient litigation remains an ongoing concern for many licensed medical and dental practitioners. Medical malpractice lawsuits have been a common occurrence

in the United States since 1960.<sup>1</sup> The malpractice risk for general surgeons and neurosurgeons is especially high, being around 65% and 95%, respectively.<sup>2</sup> Although there are relatively high occurrences of litigation within surgery, research detailing the weight

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of these effects for various surgical subspecialties and common diagnoses remains relatively scarce. Of these, procedures involving head and neck surgeries have been studied for medical litigation. To our knowledge, examination of malpractice due to the surgical treatment of trigeminal neuralgia (TN) has not yet been conducted.

TN is a chronic pain condition presenting in the trigeminal nerve distribution, which often occurs when the nerve is compressed by a blood vessel or tumor. The typical presentation of TN may include recurrent paroxysms of a unilateral, severe shooting, and burning pain, which can be triggered by gentle touching of the face, during mastication, or while brushing teeth.<sup>3</sup> Causes for these presentations are not entirely understood, but they may be due to aging, a neuropathic pain as a consequence of stroke, or direct damage to the myelin nerve sheath. Dental ailments and surgical procedures may also mimic the neuropathic pain associated with TN. To treat the commonly chronic and very severe pain that can occur from TN, a series of medical treatments are usually applied as an initial approach. Primarily, these treatments include sodium channel blockers (eg, carbamazepine and oxcarbazepine), which are understood to decrease neuronal activity through modulation of voltage-gated sodium channels.<sup>3</sup> If combination medical treatments are unhelpful, procedures such as microvascular decompression or stereotactic radiosurgery may be employed. Other surgical treatment methods may be explored depending on the determined cause of a patient's TN.

There have been case reports of patients with atypical presentations of TN in whom a diagnosis was missed.<sup>4</sup> There have also been presented cases of patients in whom a trigeminal neuropathy was uncovered after a dental procedure.<sup>5</sup> Such cases have also been reported in the media after patients decided to file a lawsuit.<sup>6</sup> However, to our knowledge to date, no study has comprehensively examined lawsuits filed by patients with respect to the surgical management of TN. Our study aims to fill the vacancy of litigation studies related to TN management, and to give health care providers the necessary information needed to better understand the potential litigious outcomes that often follow certain treatment methods.

## Methods

### DATA SOURCE

For the presented study, we queried the Westlaw Edge (Thomson Reuters) online legal database with the aim of identifying public litigation cases related to the management of TN for the years 1985-2019.<sup>7</sup> The database Westlaw Edge serves as a comprehensive national repository for legal cases from all court levels

across the United States of America. Cases presented in Westlaw are screened for accuracy by attorneys.<sup>8,9</sup>

### COHORT

Cases documented as Jury Verdicts and Settlements from all Federal- and State-level courts were searched. Legal cases were included in the study provided that they were related to 1 individual patient, and the allegation was directly related to engagement with medical staff who diagnosed or managed TN. To obtain the most comprehensive number of cases from the database, the following search criteria were used: (trigeminal & neuralgia), (tic & douloureux) and (microvascular & decompression). The "&" function ensures that terms are found as a combination in a given sentence.

### OUTCOMES AND COVARIATES OF INTEREST

TN data were extracted from the Westlaw database. The variables extracted included the following: plaintiff and defendant background, trial year, litigation category, plaintiff medical complaints, trial outcome, and payout if applicable. Demographic characteristics of patient age and sex were also recorded. These characteristics were then compared based on verdict in favor of the defendant (physician/dentist) and cases with a verdict in favor of the plaintiff.

### STATISTICAL ANALYSIS

Continuous variables were summarized using means and standard deviations and compared between cases in favor of defendant and cases in favor of plaintiff using t-test or Wilcoxon rank sum test. Categorical variables were summarized using frequencies and proportions and compared between the 2 groups using  $\chi^2$  or Fisher exact test.

## Results

About 122 cases relating to TN and medical malpractice occurring from 1985 to 2019 were obtained from the primary search. Of those, 73 cases were excluded from the study due to litigation focused on a motor vehicle crash, premises liability, product liability, insufficient information about the case, or the presence of duplicate cases (Table 1). After screening, there were a total of 49 cases eligible for inclusion in this analysis.

### DEMOGRAPHICS

Of the total 49 cases, 13 (26.5%) were men, 35 (71.4%) were women, and 1 (2.0%) was of unknown sex (Table 2). The average age of those who filed a claim was 48.1 years (range 22 to 78 years old).

**Table 1. WESTLAW NEXT EXCLUDED CASES**

Reason for Exclusion (n, (%))	Total (n = 73)
Duplicate case	32 (43.8%)
Motor vehicle accident case	25 (34.2%)
Premises liability case	9 (12.3%)
Product liability case	2 (2.7%)
Other*	5 (6.8%)

\* Note: Other category included cases that involved property investment theft, assault and battery, disability discrimination.

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### GEOGRAPHIC DISTRIBUTION

Cases involving TN were declared across 17 states in the United States. Notably, New York (n = 11; 22.4%) had the greatest number of cases, with California and Pennsylvania following with 7 (14.3%) cases each (Table 2).

### REASONS FOR LITIGATION

Occurrence of a surgical complication (n = 21; 42.9%) was cited as the most common alleged reason for filing a malpractice claim. The second most common reason was failure to diagnose (n = 16; 32.7%). Other cases cited failure of informed consent (n = 6; 12.2%), failure to treat (n = 5; 10.2%), and imaging complication (n = 1, 2.0%) (Table 2).

### PLAINTIFF COMPLAINTS OR OUTCOMES INVOLVED IN CLAIM

For preoperative symptoms, including symptoms reported by patients who never underwent a procedure, cranial nerve deficits (n = 10; 21%), and financial loss (n = 2; 4%) were the most frequent complaints (see Table 2 and Fig 1). Other complaints included loss of consortium, facial paralysis, speech impairment, quadriplegia, and headache or chronic headache each represented in 1 (2%) case.

Postoperative grievances included cranial nerve deficits (n = 17; 34.7%), loss of consortium (n = 6; 12.2%), financial loss (n = 4; 8.2%), death (n = 4; 8.2%), and emotional distress (n = 3; 6.1%) (see Table 2 and Fig 1). New postoperative symptoms afflicting patients in the presented cases most commonly included vision impairment or loss (n = 4; 8.2%), facial paralysis (n = 3; 6.1%), and deafness and motor weakness both with 2 (4.1%) cases each. Less common symptoms included hemorrhage, ischemic stroke, disequilibrium, and memory loss each with 1 (2.0%) case. Details from cases also noted plaintiffs claiming loss of consortium (n = 6; 12.2%), financial loss (n = 4; 8.2%), death (n = 4; 8.2%), and emotional distress (n = 3; 6.1%).

### SPECIALTIES OF DEFENDANTS

Of the 49 cases included, the most frequently implicated defendant specialties were dentistry (n = 31; 63.3%) and neurosurgery (n = 10; 20.4%) (Table 2). A hospital, medical center, or health care system was involved in 9 (18.4%) cases. Anesthesiology, family medicine, internal medicine, otolaryngology, and radiology each were involved in 1 (2%) case.

### LEGAL JURISDICTION, VERDICT, AND PAYMENTS

Information on case outcome was available for 46 of the 49 cases included in this study. A verdict was reached at the state level for all of these cases. Verdicts ruled in favor of the defendant in 30 (61.2%) of cases, and for the plaintiff in 13 (26.5%). A settlement was reached in 3 (6.1%) cases. The payout range for all verdicts ranged from \$55,000 to 7,978,185. The mean payout for verdicts in favor of the plaintiff was \$1,982,428.46, which was greater than the \$660,724.67 mean for settlements. When considering payouts based on specialty, the largest amount was in a single case involving anesthesiology, where the payout was \$7,978,185 (Table 3). The next highest average payout was \$1,030,898 over 9 cases against a hospital, medical center, or health care system group. Dental specialists were included in the most cases, 31 (63.3%), and the average payout was \$415,908. Neurosurgical specialists were involved in 10 (20.4%) cases which were found to have an average payout of \$618,775.

We also compared characteristics between cases which had a verdict in favor of the defendant (n = 30) and those in favor of plaintiff (n = 13) (Table 4). Cases where the verdict was in favor of the plaintiff were more likely to be older ( $55.6 \pm 12.9$  vs  $42.9 \pm 12.5$ ,  $P = .03$ ). Other factors found to be different but not approaching statistical significance included defendant's position where cases in favor of the plaintiff were more likely to involve physicians (53.8%, n = 7 vs 30%, n = 9,  $P = .137$ ); type of lawsuit where cases in favor of plaintiff were more likely to be malpractice lawsuits (66.7%, n = 8 vs 36.7%, n = 11,  $P = .078$ ). Finally, cases with verdict in favor of plaintiff, compared to those with verdict in favor of defendant, were more likely to involve a litigation of failure to treat and informed consent failure (failure to treat: 23.1%, n = 3 vs 6.7%, n = 6; informed consent failure: 23.1%, n = 3 vs 3.3%, n = 1; overall  $P = .093$ ).

### Discussion

This study presents a 34-year analysis of medical malpractice litigation in the United States pertaining to the management of TN. TN characteristically worsens over time, as the remission period becomes

**Table 2. SUMMARY OF KEY CHARACTERISTICS**

Variable	Total n = 49
<b>Demographics</b>	
Age (mean ± SD)	48.1 ± 14.8
Females (n, (%))	35 (71.4%)
<b>Geographic distribution (n (%))</b>	
Alabama	1 (2.0%)
California	7 (14.3%)
Colorado	1 (2.0%)
Connecticut	1 (2.0%)
Florida	4 (8.2%)
Kansas	1 (2.0%)
Kentucky	1 (2.0%)
Maryland	1 (2.0%)
Michigan	2 (4.1%)
Minnesota	1 (2.0%)
Missouri	3 (6.1%)
New Jersey	5 (10.2%)
New York	11 (22.4%)
Ohio	1 (2.0%)
Pennsylvania	7 (14.3%)
Virginia	1 (2.0%)
Washington	1 (2.0%)
<b>Type of court</b>	
Circuit Court	10 (20.4%)
Court of Common Pleas	8 (16.3%)
District Court	3 (6.1%)
Superior Court	13 (26.5%)
Supreme Court	8 (16.3%)
Unknown State Court	7 (14.3%)
<b>Malpractice vs negligence lawsuit</b>	
Malpractice	24 (49.0%)
Negligence	24 (49.0%)
N/A	1 (2.0%)
<b>Reasons for litigation (n (%))*</b>	
Surgical complications	21 (42.9%)
Failure to diagnose	16 (32.7%)
Failure of informed consent	6 (12.2%)
Failure to treat	5 (10.2%)
Imaging complications	1 (2.0%)
<b>Plaintiff complaints (n, (%))</b>	
Preoperative claims/those who did not undergo surgery	
Cranial nerve deficits	10 (20.4%)
Financial loss	2 (4.1%)
Facial paralysis	1 (2.0%)
Headache or chronic headache	1 (2.0%)
Loss of consortium	1 (2.0%)
Quadriplegia	1 (2.0%)
Speech impairment	1 (2.0%)
Postoperative claims	
Cranial nerve deficits	17 (34.7%)
Loss of consortium	6 (12.2%)
Death	4 (8.2%)
Financial loss	4 (8.2%)

**Table 2. Cont'd**

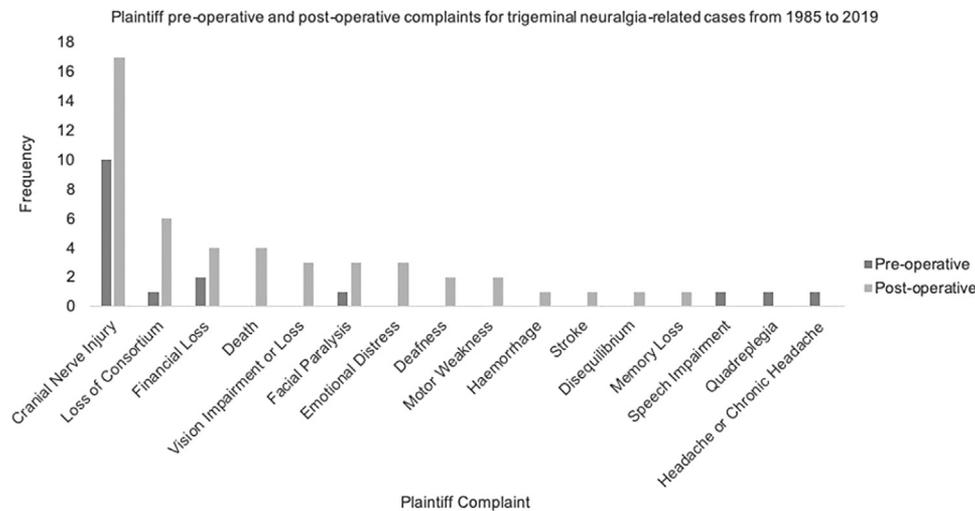
Variable	Total n = 49
Emotional distress	3 (6.1%)
Facial paralysis	3 (6.1%)
Vision impairment or loss	3 (6.1%)
Deafness	2 (4.1%)
Motor weakness	2 (4.1%)
Disequilibrium	1 (2.0%)
Hemorrhage	1 (2.0%)
Memory loss	1 (2.0%)
Stroke	1 (2.0%)
<b>Specialties of defendants</b>	
Dentistry	31 (63.3%)
Neurosurgery	10 (20.4%)
Hospital, medical center, or health care system	9 (18.4%)
Oral and maxillofacial surgery	2 (4.1%)
Anesthesiology	1 (2.0%)
Family practice	1 (2.0%)
Internal medicine	1 (2.0%)
Otolaryngology	1 (2.0%)
Radiology	1 (2.0%)
<b>Legal jurisdiction</b>	
Settlement	3 (6.1%)
Defendant verdict	30 (61.2%)
Plaintiff verdict	13 (26.5%)
Dismissed	1 (2.0%)
N/A	2 (4.1%)
Mean payout for plaintiff verdicts	\$1,982,428.46
Mean payout for settlements	\$660,724.67

\* Some cases had more than 1 reason for litigation.

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shorter, and medications become less effective. Furthermore, the intrusive nature of the condition can complicate simple daily activities, such as oral communication, eating full meals, and maintaining oral hygiene.<sup>10</sup> Owing to the characteristic symptoms of the condition, it is not surprising that litigation often followed procedures that incited or worsened the facial pain in afflicted patients.

Our analysis identified New York (n = 11; 22.4%), California (n = 7; 14.3%), and Pennsylvania (n = 7; 14.3%) as the states with the highest number of TN-related litigation cases (Table 2). All 3 states are in the top 5 for population in the United States, thus it logically follows that a higher proportion of cases are represented in these states. In addition, neither New York nor Pennsylvania has a cap on malpractice damages, whereas other states we identified with a lower number of TN cases, such as Colorado, Kansas, Maryland, Michigan, Ohio, and Washington, all have caps



**FIGURE 1.** The most frequent preoperative plaintiff complaints were cranial nerve injury ( $n = 10$ ; 20.4%) and financial loss ( $n = 2$ ; 4.1%). The most frequent postoperative plaintiff complaints were cranial nerve injury ( $n = 17$ ; 34.7%), loss of consortium ( $n = 6$ ; 12.2%), and financial loss and death, both reported for 4 (8.2%) cases. Additional postoperative symptoms included vision impairment or loss ( $n = 3$ ; 6.1%) and facial paralysis ( $n = 3$ ; 6.1%), followed by deafness ( $n = 2$ ; 4.1%) and motor weakness ( $n = 2$ ; 4.1%).

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on malpractice damages awarded to plaintiffs, providing less of an incentive to pursue litigation.

In this study, the most common reasons for litigation were surgical complications ( $n = 21$ ; 42.9%) and failure to diagnose ( $n = 16$ ; 32.7%) (see Table 2 and Fig 1). These findings are consistent with a previous study of medical malpractice in neurosurgery that found procedural error (45.5%) and failure to diagnose (41.4%) as the top cited reasons for litigation.<sup>11</sup> Cranial nerve deficits ( $n = 17$ ; 35%) and loss of consortium ( $n = 6$ ; 12.2%) were the most numerous postoperative complaints (Fig 1). Cranial nerve deficits may not only result in additional complaints of vision impairment or loss, facial paralysis, deafness, and other deficits, but it can also exacerbate symptoms

of TN, providing a potential correlation between the high frequencies of surgical complication as a reason for litigation, and cranial nerve deficits as a postoperative complaint.

Although TN is most commonly initially treated non-operatively with an anticonvulsant medication such as carbamazepine, the etiology of the disease (eg, MS, blood vessel or tumor compression, facial trauma) and subjective severity of pain may necessitate surgical intervention. Microvascular decompression has been found to sustain pain relief in 73% of patients over 5 years.<sup>3</sup> As with many invasive surgical procedures, this treatment approach does not come without risks. Complications found to occur after microvascular decompression may include aseptic meningitis, sensory loss, and hearing loss.<sup>3,12</sup>

The 2 defendant specialties most commonly cited in claims were dentistry ( $n = 31$ ; 63.3%) and neurosurgery ( $n = 10$ ; 20.4%) (Table 1). The vast majority of claims studied were filed against defendants involved in dentistry. The large representation of legal claims faced by dentists is likely because they are the specialists frequently consulted first, with gingival and tooth pain during mastication being a common presenting symptom of TN.<sup>13,14</sup> This might also explain why a large majority of cases resulted in a favorable verdict for the defendant in these cases ( $n = 30$ ; 61.2%) (Table 2). The condition may have been pre-existing, and simply manifested after a visit to the defendant dentist, also potentially refuting plaintiff claims of surgical complications.

The highest average payout based on defendant specialty was for anesthesiology at \$7,978,185. However,

**Table 3. AVERAGE PAYOUT BASED ON MEDICAL SPECIALTY OF THE DEFENDANT**

Specialties of Defendants	Average Payout
Anesthesiology	\$7,978,185
Dentistry	\$415,908
Family practice	\$-
Hospital, medical center, or health care system	\$1,030,898
Internal medicine	\$-
Neurosurgery	\$618,775
Oral and maxillofacial surgery	\$-
Otolaryngology	\$-
Radiology	\$-

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**Table 4. COMPARATIVE ANALYSIS BETWEEN CASES WITH VERDICT IN FAVOR OF DEFENDANT AND THOSE IN FAVOR OF PLAINTIFF**

Variable	Defendant (n = 30)	Plaintiff (n = 13)	P value
Type of Court			.521
Circuit Court	4 (13.3%)	4 (30.8%)	
Court of Common Pleas	6 (20.0%)	2 (15.4%)	
District Court	3 (10.0%)	0 (0.0%)	
Superior Court	9 (30.0%)	2 (15.4%)	
Supreme Court	4 (13.3%)	3 (23.1%)	
Unknown State Court	4 (13.3%)	2 (15.4%)	
State			.289
California	4 (13.3%)	1 (7.7%)	
Colorado	1 (3.3%)	0 (0.0%)	
Connecticut	1 (3.3%)	0 (0.0%)	
Florida	3 (10.0%)	1 (7.7%)	
Kansas	1 (3.3%)	0 (0.0%)	
Kentucky	0 (0.0%)	1 (7.7%)	
Maryland	1 (3.3%)	0 (0.0%)	
Michigan	1 (3.3%)	0 (0.0%)	
Minnesota	1 (3.3%)	0 (0.0%)	
Missouri	0 (0.0%)	3 (23.1%)	
New Jersey	4 (13.3%)	1 (7.7%)	
New York	6 (20.0%)	4 (30.8%)	
Ohio	0 (0.0%)	1 (7.7%)	
Pennsylvania	6 (20.0%)	1 (7.7%)	
Virginia	1 (3.3%)	0 (0.0%)	
Location			.157
Academic	1 (6.2%)	2 (40.0%)	
Private	14 (87.5%)	3 (60.0%)	
Public	1 (6.2%)	0 (0.0%)	
Patient age			.030
Mean (SD)	42.9 (12.5)	55.6 (12.9)	
Range	22.0–60.0	29.0–67.0	
Defendant type			.189
Hospital	1 (3.3%)	0 (0.0%)	
Individual	23 (76.7%)	7 (53.8%)	
Multiple	6 (20.0%)	6 (46.2%)	
Defendant's position			.137
Dentist	21 (70.0%)	6 (46.2%)	
Physician	9 (30.0%)	7 (53.8%)	
Malpractice vs negligence			.078
Malpractice	11 (36.7%)	8 (66.7%)	
Negligence	19 (63.3%)	4 (33.3%)	
Litigation category			.093
Failure to diagnose	11 (36.7%)	2 (15.4%)	
Failure to provide referral	1 (3.3%)	0 (0.0%)	
Failure to treat	2 (6.7%)	3 (23.1%)	
Imaging or surgical complication	15 (50.0%)	5 (38.5%)	
Informed consent failure	1 (3.3%)	3 (23.1%)	

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there was only a single case involving this specialty. Neurosurgery presented as the specialty with the highest average payout (for specialties with N > 1) at \$618,775. Neurosurgeons are responsible for the surgical, and often stereotactic, treatment of TN, such

as percutaneous procedures on the Gasserian ganglion, gamma knife surgery, and microvascular decompression. Technical, yet minimally invasive procedures, may provide patients with high expectations or reassurance for resolution of their symptoms.

Patients are also likely to agree to these interventions after rounds of failed medical treatments, and unresolved or near dysfunctional chronic pain. In addition, the nature of the aforementioned procedures may carry increased surgical risk. Such possibilities may provide logic for the neurosurgical specialty being one of the most commonly represented in lawsuits and payouts pertaining to TN.<sup>12</sup>

As supported by previous studies, a significant proportion of patients with unresolved pain due to a diagnosis of TN may have a history of tooth extraction or dentistry evaluation.<sup>15,16</sup> Some of these patients are likely to seek out non-neurologist or dental care to evaluate their pain. **In addition, patients who undergo extraction before TN onset may have a missed or delayed diagnosis, which can cause poor quality-of-life and lead to litigation for all parties who were involved in the medical management. An increased suspicion for TN when evaluating dental and cheek pain may aid in earlier diagnoses, an understanding of the primary etiology, and thus a more plausible treatment approach.**

### **Verdict in Favor of the Plaintiff Versus Verdict in Favor of the Defendant (Based on P Values)**

Our finding that cases with physicians and dentists as defendants were more likely to result in a verdict in favor of the plaintiff has previously been demonstrated by Shantharam et al., who investigated factors associated with outcomes of malpractice litigation among patients with spinal epidural abscess and found a similar association.<sup>17</sup> **The same study found that a delay in treatment was associated with a verdict more likely in favor of the plaintiff.** Finally, our finding that informed consent failure was associated often with a verdict in favor of the defense warrants a specific discussion. A study by Cassileth et al. showed that among patients who were tested on their recall of the details of the informed consent 24 hours after it was obtained, only 60% remembered the purpose of the treatment and only half of the patients could list one potential complication.<sup>18</sup> This underscores the need for clear and explicit consent for the surgical or radiosurgical treatment of TN. Patients afflicted with this condition are often desperate for a solution due to the extreme pain. The potential risks of intervention need to be clearly made and all questions answered in full. It is wise to have family members involved with the discussion of the risks, and also a thorough discussion of all the treatment options that are available, including continued nonprocedural or medical management.

Despite the best practice of health care specialties to use timely, informed, and consensual treatments, the prolonged suffering due to chronic pain may

have several physical, emotional, and social consequences for patients. The most important point to be considered when discussing the analysis of our data is that there are several patients whose outcome is largely unsatisfactory, and thus becomes a frustration for patient and health care provider alike. A range of interventional and noninvasive modalities can be used to treat TN, but they are only an attractive armamentarium if they are not capable of providing a realistic reduction in pain, especially if the treatment results in doing more harm than good. The data presented serves as an indicator that further research is needed to understand the complex etiologies of chronic pain conditions such as TN so that we can create more efficient treatment approaches.

### **Limitations**

One limitation in our analysis is the small sample size. Although multiple search terms, such as “Trigeminal Neuralgia”, “Tic Douloureux”, and “Microvascular Decompression” were used to filter cases, many cases were excluded as they included duplicates or non-medical-related primary incidents. In addition, the Westlaw database excludes cases mediated outside of the court system and only includes cases reported at the discretion of state courts.

Another limitation to the database is that the trial data documented in Westlaw is recorded by nonmedical professionals, which may sometimes lead to reporting of less medically relevant information regarding the interventional procedures performed by the defendants. The absence of case detail in Westlaw due to the subjectivity of the recorder dampens the ability to characterize the specific subspecialty or training for those defendants who are included in the Dentistry category. There are currently 12 dental specialties that are recognized by the American Dental Association, some of which include dental anesthesiology, oral and maxillofacial surgery, oral medicine, and orofacial pain.<sup>19</sup> Given the considerable range of training and modalities of treatment that occur in dentistry, and more specifically in cases involving TN, it is important to note that the impact of treatment methods from different specialists treating dental patients may influence the factors leading to litigation. Such information could potentially provide context to the postoperative complaints and trial outcomes if included.

In conclusion, our study presents a 34-year analysis of TN-related medical malpractice suits in the United States. Over one-half of the cases resulted in a defendant's verdict with surgical complications cited as the most common reason for litigation. **Dentistry and neurosurgery were listed as the most common individual specialties for defendants, also contributing to the**

largest average payouts based on specialty (for specialties > 1 occurrence). Cranial nerve deficits, loss of consortium, financial loss, and death were the most common plaintiff complaints. **These analyses may help doctor teams involved in management of TN to have a more informed discussion with the patient at every visit so that such litigations may be avoided.**

## References

1. Kessler DP: Evaluating the medical malpractice system and options for reform. *J Econ Perspect* 25:93, 2011
2. Jena AB, Seabury S, Lakdawalla D, Chandra A: Malpractice risk according to physician specialty. *N Engl J Med* 365:629, 2011
3. Obermann M: Recent advances in understanding/managing trigeminal neuralgia. *F1000Res* 8:F1000, 2019
4. Duvall JR, Robertson CE: Clinical reasoning: A misdiagnosis of atypical trigeminal neuralgia. *Neurology* 93:124, 2019
5. Agbaje JO, Van de Castele E, Hiel M, et al: Neuropathy of trigeminal nerve branches after oral and maxillofacial treatment. *J Maxillofac Oral Surg* 15:321, 2016
6. Boodman SG: He couldn't eat, drink or work. And doctors couldn't explain his searing pain. *The Washington Post*. Published March 14, 2016. Available at: [https://www.washingtonpost.com/national/health-science/he-couldnt-eat-drink-or-work-and-doctors-couldnt-explain-his-searing-pain/2016/03/14/87c791ee-bc8c-11e5-829c-26ffb874a18d\\_story.html](https://www.washingtonpost.com/national/health-science/he-couldnt-eat-drink-or-work-and-doctors-couldnt-explain-his-searing-pain/2016/03/14/87c791ee-bc8c-11e5-829c-26ffb874a18d_story.html). Accessed December 23, 2020
7. Legal Research. Reuters. Available at: <https://legal.thomsonreuters.com/en/c/legal-research-westlaw-edge>. Accessed December 23, 2020
8. Choudhry AJ, Haddad NN, Martin M, et al: Medical malpractice in Bariatric surgery: A Review of 140 Medicolegal claims. *J Gastrointest Surg* 21:146, 2017
9. Grauberger J, Kerezoudis P, Choudhry AJ, et al: Allegations of failure to obtain informed consent in spinal surgery medical malpractice claims. *JAMA Surg* 152:e170544, 2017
10. Zakrzewska JM, Linskey ME: Trigeminal neuralgia. *BMJ Clin Evid* 2014:1207, 2014
11. Thomas R, Gupta R, Griessenauer CJ, et al: Medical malpractice in neurosurgery: A comprehensive analysis. *World Neurosurg* 110:e552, 2018
12. Obermann M: Treatment options in trigeminal neuralgia. *Ther Adv Neurol Disord* 3:107, 2010
13. Eckardstein KL von, Keil M, Rohde V: Unnecessary dental procedures as a consequence of trigeminal neuralgia. *Neurosurg Rev* 38:355, 2015
14. Trigeminal neuralgia - causes, symptoms and treatments. Available at: <https://www.aans.org/Patients/Neurosurgical-Conditions-and-Treatments/Trigeminal-Neuralgia>. Accessed July 22, 2020
15. Bendtsen L, Zakrzewska JM, Abbott J, et al: European Academy of Neurology guideline on trigeminal neuralgia. *Eur J Neurol* 26:831, 2019
16. Ayele BA, Mengesha AT, Zewde YZ: Clinical characteristics and associated factors of trigeminal neuralgia: Experience from Addis Ababa, Ethiopia. *BMC Oral Health* 20:244, 2020
17. Shantharam G, DePasse JM, Eltorai AEM, et al: Physician and patients factors associated with outcome of spinal epidural abscess related malpractice litigation. *Orthop Rev* 10:7693, 2018
18. Cassileth BR, Zupkis RV, Sutton-Smith K, March V: Informed consent — why are its Goals Imperfectly Realized? *New Engl J Med* 302:896, 1980
19. Specialty Definitions. Available at: <https://www.ada.org/en/ncrdscb/dental-specialties/specialty-definitions>. Accessed December 23, 2020