

# Medical Malpractice Litigation Following Spine Surgery in Beijing: The Past 6 Years.

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## Research article

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# Abstract

**Background:** Spine surgeons in particular face the most hostile liability environment among the surgical specialties. Systemic studies related to spine surgery litigation in China is absent. The aim of this study was to analyze the characteristics of medical malpractice litigation involving spine surgery in Beijing for the past 6 years.

**Methods:** Two online legal databases, Wusong and Weike, were queried for court verdicts involving spine surgery from Jan 2013 to Dec 2018 in Beijing. For all included cases, data pertaining to defendants, plaintiffs, case outcomes, allegations, and verdicts were abstracted, and descriptive analyses were performed.

**Results:** A total of 186 legal cases were examined, 122 cases were excluded due to irrelevance or insufficient information. Of the 64 cases included in this investigation, 40.6% of them were male. The mean age of the plaintiffs was  $53.2 \pm 18.6$  years. The most common complaint addressed in this study is dissatisfaction with consent (53.1%, n=34), followed by additional surgery required (40.2%, n=26), unsatisfactory outcome to surgery (17.6%, n=11), postoperative paralysis (15.6%, n=10) and postoperative infection (15.6%, n=10). The most common primary disease among all the cases is lumbar spinal stenosis (28.1%, n=18), followed by spinal tumor (18.8%, n=12), cervical spondylosis (17.2%, n=11), vertebral fracture (14.1%, n=9), deformity (12.5%, n=8) and others (9.3%, n=6). Spine surgeons successfully defended themselves in 13 cases (20.3%), which resulted in no indemnity payment. The rest 51 cases (79.7%) were closed with an average verdict payout of 155,562 Yuan, which was significant lower than the average compensation claimed by the plaintiff (783,172 Yuan) ( $p < 0.05$ ).

**Conclusions:** Identifying the most common reasons for litigation and summarizing their characteristics may help decrease litigation rate and improve the patient experience. Further investigations with larger sample size and more complete database are needed.

## Background

Malpractice claim characteristics differ greatly among various medical specialties.(1, 2) Spine surgeons in particular face the most hostile liability environment among the surgical specialties given the severity of potential complications that can be encountered, including chronic pain, numbness, and paralysis.(3) Medical malpractice lawsuits pose economic and emotional burdens that weigh heavily on both the spine surgeon and the patient.(4)

Recent trends showing incidence of medical malpractice litigation in China is increasing rapidly.(5–8) According to the 2017 China Health Statistical Yearbook, it is estimated that malpractice litigation cases in China has been doubled from 2006 to 2016.(9) However, due to the limited and confidential nature of most legal data, scarce literature is available to spinal surgeons about reasons for litigation. Despite a few studies have attempted to characterize malpractice litigation in spine surgery, all of them came from western countries.(10–16) There have been no related systemic published studies in China.

Understanding which claims have led to litigation against spine surgeons in China, as well as the distribution and nature of these claims, is critical in being able to help doctors protect both themselves and their patients as well.

The purpose of this study was to present a snapshot of the medical malpractice litigation involving spine surgery in Beijing, the capital city of mainland China with a resident population of 25 million, for the past 6 years.

## Methods

Publicly available court verdicts related to spine surgery malpractice litigation in Beijing, from January 2013 to December 2018, were identified in two online legal databases (Westlaw and Weike). These databases provide online legal research service for lawyers and legal professionals which can provide information regarding national cases in China. Court verdicts were obtained using the search terms "Beijing", "spine", "surgery", and "malpractice". Exclusion criteria included duplicate cases, unrelated topics, and lack of reported data. Each case file was then thoroughly reviewed and data pertaining to defendants, plaintiffs, case outcomes, allegations, and verdicts were abstracted, and descriptive analyses were extracted. Severity of damage was graded from minor/temporary to death. Data analysis was carried out using Excel and Graphpad, and statistical significance was calculated using a two-tailed Student's t-test.

## Results

In total, 186 cases were identified from the two databases initially; 81 cases were repeated and 41 cases were excluded for missing information or irrelevance, leaving a total of 64 cases for final analysis. (Fig. 1)

The mean age of the plaintiffs was  $53.2 \pm 18.6$  years; 26 cases (40.6%) of the plaintiffs were male and 38 cases (59.4%) were female. Among all the included medical malpractice cases, 55 cases (86.0%) occurred in public hospital while 9 cases (14.1%) occurred in private ones. As for the spine surgeon's specialty, 45 cases (70.3%) involved orthopedic surgeons, 11 cases (17.2%) involved neurosurgeons, and 8 cases (12.5%) did not specify it. There are 39 cases (60.9%) of first instance, 24 cases (37.5%) of second instance and 1 case of retrial.

Among all the spinal operations, there were 30 cases (46.9%) of lumbar, 14 cases (21.9%) of cervical, 8 cases (12.5%) of thoracic, and 12 cases (18.7%) of multiple location surgeries. As shown in Table 1, the most common primary disease leading to treatment is lumbar spinal stenosis (28.1%, n = 18), followed by spinal tumor (18.8%, n = 12), cervical spondylosis (17.2%, n = 11), vertebral fracture (14.1%, n = 9), deformity (12.5%, n = 8) and others (9.3%, n = 6).

Table 1  
Case characteristics, subspecialties involved and  
medical details

Variable	Value
Age (at time of treatment) (years)	53.2 ± 18.6
Plaintiff sex (%)	
Male	26(40.6%)
Female	38 (59.4%)
Hospital involved (%)	
Public	55 (86.0%)
Private	9 (14.1%)
Case category (%)	
Case of first instance	39 (60.9%)
Case of second instance	24 (37.5%)
Case of retrial	1 (1.6%)
Subspecialty involved (%)	
Orthopedic surgery	45 (70.3%)
Neurosurgery	11 (17.2%)
Unknown	8 (12.5%)
Diagnoses leading to treatment (%)	
lumbar spinal stenosis	18 (28.1%)
Tumor	12 (18.8%)
Cervical spondylosis	11 (17.2%)
Vertebral body fracture	9 (14.1%)
Deformity	8 (12.5)
Others	6 (9.4%)
Spinal region (%)	
Lumbar	30 (46.9%)
Cervical	14 (21.9%)
Thoracic	8 (12.5%)

Variable	Value
Multiple location	12 (18.7%)
Damage severity (%)	
Minor, Temporary	9 (14.1%)
Significant Physical	37 (57.8%)
Paralysis	10 (15.6%)
Death	5 (7.8%)
Unspecified	3 (4.7%)

We further analyzed the disability determination report of patients. Significant physical injury was alleged in the vast majority of cases (57.8%, n = 37), followed by paralysis (15.6%, n = 10). Minor or temporary alleged injuries were less common (14.1%, n = 9). Patient death was noted in 5 cases (7.8%).

To glean a better understanding of the motivating force behind each claim, an attempt was made to isolate the main issues from the patient's perspective. As shown in Fig. 2, dissatisfaction with consent (53.1%, n = 34) is the most commonly cited reason for litigation, followed by additional surgery required (40.6%, n = 26), unsatisfactory outcome to surgery (17.2%, n = 11), postoperative paralysis (15.6%, n = 10), postoperative infection (15.6%, n = 10) and delay in diagnosis (14.0%, n = 9). Intraoperative nerve injury (9.4%, n = 6), and breakage of internal fixation (7.8%, n = 5) were less common causes for concern. Of note, among the 10 cases of postoperative paralysis, four patients already developed degenerated muscle strength or even incomplete paralysis before the first surgery. Among the 9 cases with the claim of delay in diagnosis, there are 5 cases of spinal tumor, 2 cases of spinal tuberculosis, 1 case with lumbar brucellosis spondylitis, and 1 case with vertebra fracture. Two cases (3.1%) complained with wrong level during percutaneous vertebroplasty in the treatment of vertebral body compression fracture.

The most likely outcome of included litigation was a jury verdict in favor of the plaintiff, as shown in Table 2. Spine surgeons successfully defended themselves only in 13 (20.3%) cases, which resulted in no indemnity payment. The rest 51 (79.7%) cases were closed with a mean verdict payout of 155,562 Yuan (range 34,373–697,834 Yuan), which was significantly lower than the mean compensation claimed by the plaintiff 783,172 Yuan (range 49,290–2,969,393 Yuan) ( $p < 0.05$ ). Of note, despite of having a court verdict of no indemnity payment, defendants in 4 cases still paid an average compensation of 20,000 Yuan to appease the plaintiffs out of humanitarian concerns.

Table 2  
Average compensation by case descriptor

Verdicts	No. cases, (percentage)	Mean plaintiff claimed payouts,  Yuan (range)	Mean defendant verdict payouts,  Yuan (range)	Time from surgery to verdict,  Years (range)
Not guilty	13 (20.3%)	328,494  (40,128–644,582)	0 (0–0)	3.0 (1.2–4.4)
Guilty	51 (79.7%)	783,172  (49,290-2,969,393)	155,562  (34,373–697,834)	5.5 (2.0-9.5)
Total	64 (100%)	690,816  (40,128-2,969,393)	123,963  (0-697,834)	4.5 (1.2–9.5)

On average, it took 4.5 years (range 1.2–9.5 years) after the date of first operation for the case to end via verdict. Among the cases that surgeons were held guilty, the time elapsed from the first surgery to the end of verdict was 5.5 years (range 2.0-9.5 years), which is significant lengthier than 3.0 years (range 1.2–4.4 years) of not guilty ( $p < 0.05$ ).

## Discussion

In the past few years, with the rapid improvement of national economy and the enhancement of public legal awareness in mainland China, more and more patients choose litigation instead of private settlement as the solution of medical malpractice. Effective learning from litigation continues to be important since it allows good practice to be shared and has the potential to reduce the number of litigations. Most importantly, this learning can improve the safety and quality of patient care, and to reduce the costs of litigation.

In this study we looked at 64 cases brought against spine surgeons from the period of 2013–2018 in Beijing. To our knowledge, our study represents the very first detailed analysis of malpractice claims against spine surgeons in China.

In current study, more than half of the litigations have a claim of dissatisfaction with consent (53.1%,  $n = 34$ ), underscoring the particular importance of communication and documentation in the patient-physician relationship in China. We noted that this proportion is extremely higher compared with that of previous published studies from other countries.(4, 10–16) However, it appears to be consistent with the previous study conducted by Grauberger et al(3). They investigated malpractice litigations related to spinal surgery through the time of 1980 to 2015 in the United States and found 65.7% of cases failure to obtain informed consent as a primary or secondary allegation.

The outstanding problem with informed consent in China may be explained by the fact that most hospitals are relative shortage of properly trained doctors due to the huge population and rapid increasing demand for care in China.(17) Hence, surgeons spent limited time on communicating with patients and obtaining informed consent. Situation is even worse in a metropolis like Beijing with a population of more than 25 million.

With efforts to enhance the patients-physician communication in China, a reduction of unnecessary litigation can be expected in certain extent. We suggested that informed consent should involve discussion of all possible interventions that may be undertaken, no matter how unlikely, during the procedure. Also for those patients who have already developed neurological damage, an unpredictable outcome should be noticed pre-operation to avoid an irrational expectation. Sound and clear communication and complete documentation can help reducing the risk of litigation and protect the surgeons if perceived negligence occurs.

Our study also found “additional surgery required” resulted in a large percentage of claims (40.6%, n = 26). Actually we found an average number of operations at 2.4 (range 1–7) in our included cases. This can also explain the lengthy time (average 4.5 years, range 1.2–9.5 years) from the first operation to the end of verdict observed in current study. In this study most multiple operations resulted from surgical site infection, breakage of internal fixation, or inadequate decompression. Those conditions always come with extraordinarily high medical cost, which is unaffordable to most Chinese families and means going into debt since the scope of the medical insurance coverage is limited and the quality is spotty.

We noticed that spine surgeons successfully defended themselves in 13 cases (20.3%) of lawsuits in our study, which appears to be different with the findings from other countries. In England, Quraishi et al.<sup>15</sup> examined 68 claims of malpractice made against spinal surgeons between 2000 and 2009 and they found 65% claims were closed in favor of the defendant surgeon. Another study conducted by Machin et al.<sup>11</sup> reviewed 105 closed claims against spinal surgeons in England from 2012 to 2017, which found 37.14% claims were successfully defended without incurring any cost. In the United States, Makhni et al.<sup>4</sup> identified 103 spine surgery malpractice cases between 2010 and 2014 and they found 75% of cases were ruled in favor of the defendant surgeon. Epstein<sup>16</sup> reviewed 78 cervical spine related litigation cases and 38.4% claims were found successfully defended by surgeons. Daniels et al.<sup>13</sup> reviewed 234 spine surgery related legal cases, 54.2% of them resulted in a defendant ruling. Agarwal et al.<sup>12</sup> analyzed 98 litigation cases pertaining to spine surgery from 2010 to 2015 and rulings went in favor of the defendant surgeons in a majority (63.3%) of cases.

It seems that spinal surgeons in Beijing are more likely to lose the litigation compared with their western country counterparts. This may be explained by the differences in providing evidences among medical malpractice litigation in Chinese legal systems. For a patient (plaintiff) to win a malpractice litigation suit in western countries, he/she must demonstrate that a physician was negligent. However things are far different in China since 2002 when the People’s Supreme Court issued a regulation to invert the evidential burden in medical malpractice litigation, aimed improving the situation of information asymmetry

between patient and physician. In other words, the defendant physician needs to demonstrate him/herself not guilty by providing full and complete documentation in malpractice litigation in China.

Malpractice litigation is costly from a financial perspective, and its monetary burden on healthcare systems worldwide keeps rising(4, 18–21). For the entire included cases in current study, the average verdict payout (123,963 Yuan, around 18,230 US dollars) is significant lower than the average plaintiff claimed payouts (690,816 Yuan, around 101,591 US dollars) ( $p < 0.05$ ). For the cases in favor of the plaintiff, the average verdict payout is 155,562 Yuan (around 22,876 US dollars), which is also significant lower than the average compensation addressed by reports from other developed countries(4, 10, 11). Epstein's study(16) showed an average compensation of 4.0 million US dollars in cervical spine malpractice cases when the surgeon was found guilty. Makhni et al.(4) reported a startling average compensation of 3.945 million US dollars in cases with jury verdicts. Machin et al.(11) investigated 81 claims in England between 2012 and 2017 and the average compensation was found more than 1.21 million US dollars. Of note, despite of having a court verdict of no indemnity payment in 13 cases, defendants in 4 cases still paid an average compensation of 20,000 Yuan (around 2,941 US dollars) to appease the plaintiffs out of humanitarian concerns.

We noticed that orthopedics accounts for the majority of the involved subspecialty compared with neurosurgery in current study. That is probably because spine surgery was officially listed as one of the subspecialties of orthopedics rather than neurosurgery according to the Chinese Medical Association. In the authors' experience, most of spine surgeries are carried out by orthopedist in China. Also we found that most of the malpractice cases occurred in public hospitals rather than private ones. Perhaps the immaturity of market-oriented allocation of medical resources during the reform of medical care system may help explaining and understanding this phenomenon(22, 23).

Our study had several potential confounding factors that may prevent us from drawing firm conclusions from the data available. First of all, although court records are available via legal databases, reporting of cases is not mandatory and is at the discretion of individual court systems and judges. The cases captured may not represent all of the cases in Beijing and may not represent the true distribution of the different reasons for lawsuits and decisions. Secondly, the databases contain only cases with a court verdict and do not include cases that were dropped/discarded at an earlier stage. Out-of-court settlements may not have been filed under court records. Given that a majority of claims do not end into trial, it is unsurprising that our analysis may only captured a fraction of the total number of claims in Beijing. Finally, the information presented in these cases is primarily legal in nature and medical details from most cases are not publicly reported, which limits the available information on claims.

## Conclusions

We have presented the results of the first systematic review of malpractice claims for spine surgery in China. A plaintiff's verdict was reached in the majority of the enrolled cases in current study. Dissatisfaction with consent and additional surgery required were the top two frequently cited bases for

litigation. Further larger sample sized investigations are needed to reveal the true reasons for lawsuits and to examine the ongoing trends in China.

## List Of Abbreviations

None.

## Declarations

### Ethics approval and consent to participate

Not applicable

### Consent for publication

Not applicable

### Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

### Competing interests

Not applicable

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### Authors' contributions

SX designed the whole study. DH and SG collected the primary dataset. HL and FS performed the data analysis. DH and SX drafted the manuscript. DH and SG contributed equally to this work. All authors have read and approved the manuscript.

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## Figures

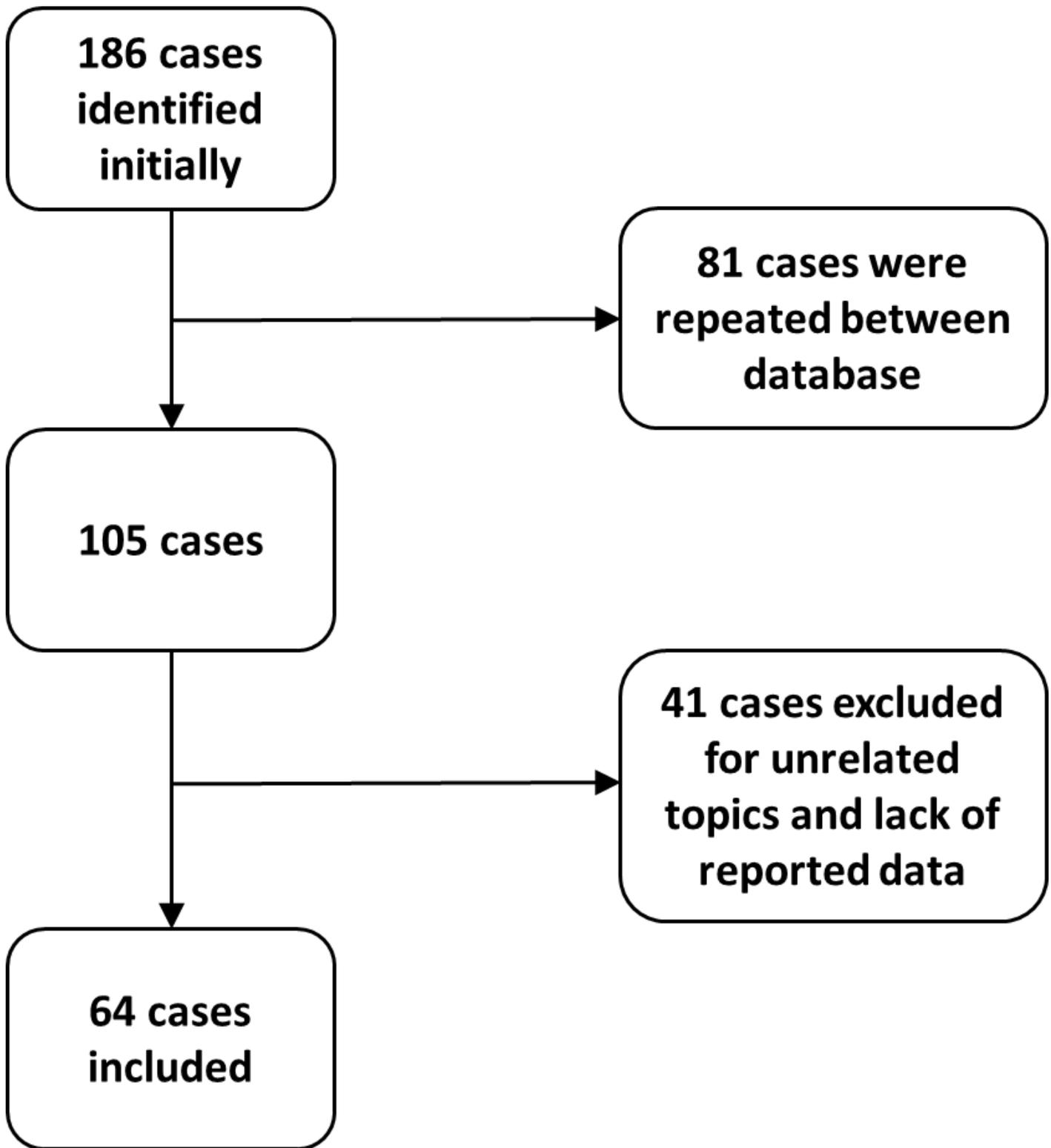


Figure 1

Flowchart describing cases that were included and those that were excluded

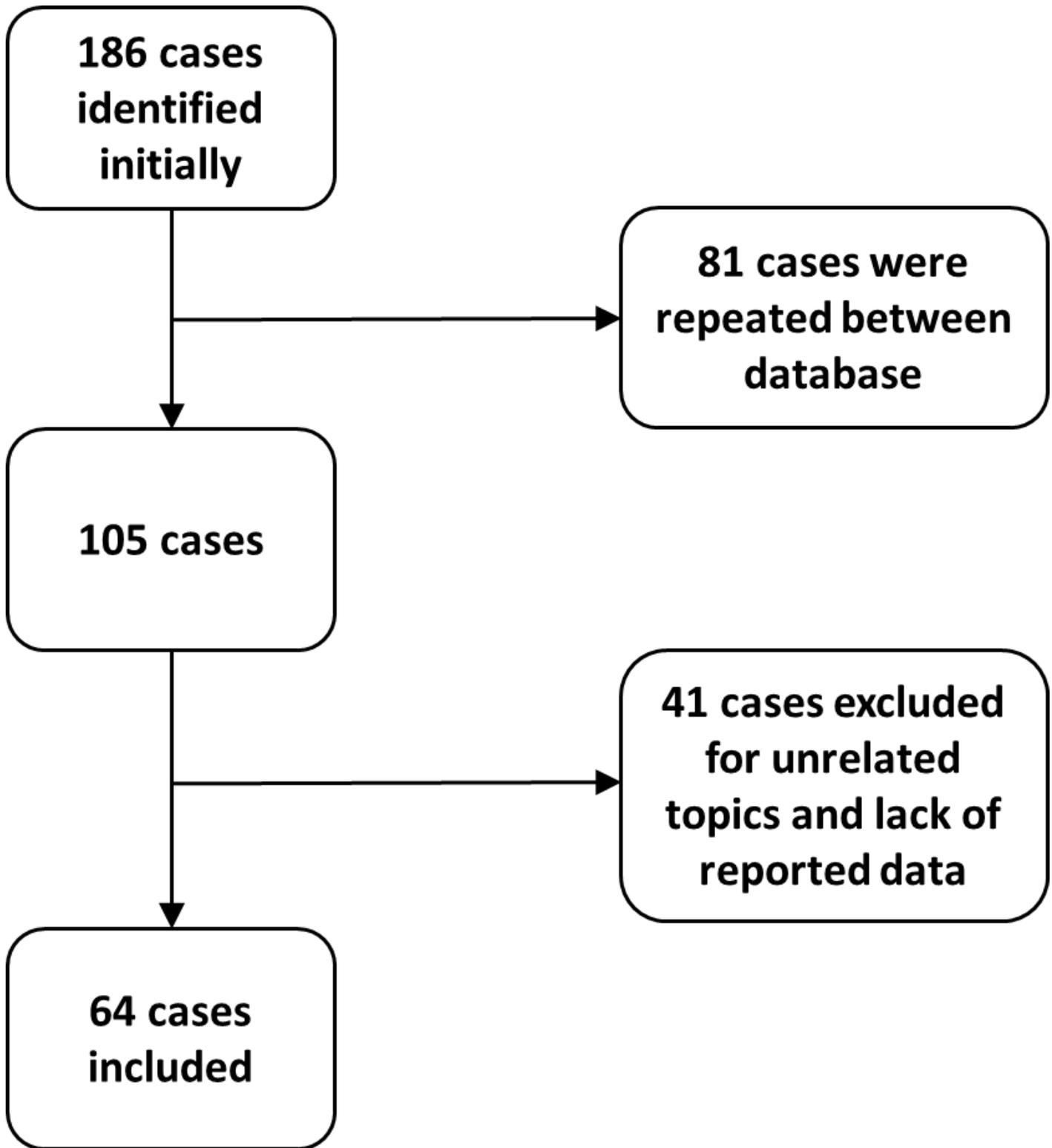


Figure 1

Flowchart describing cases that were included and those that were excluded

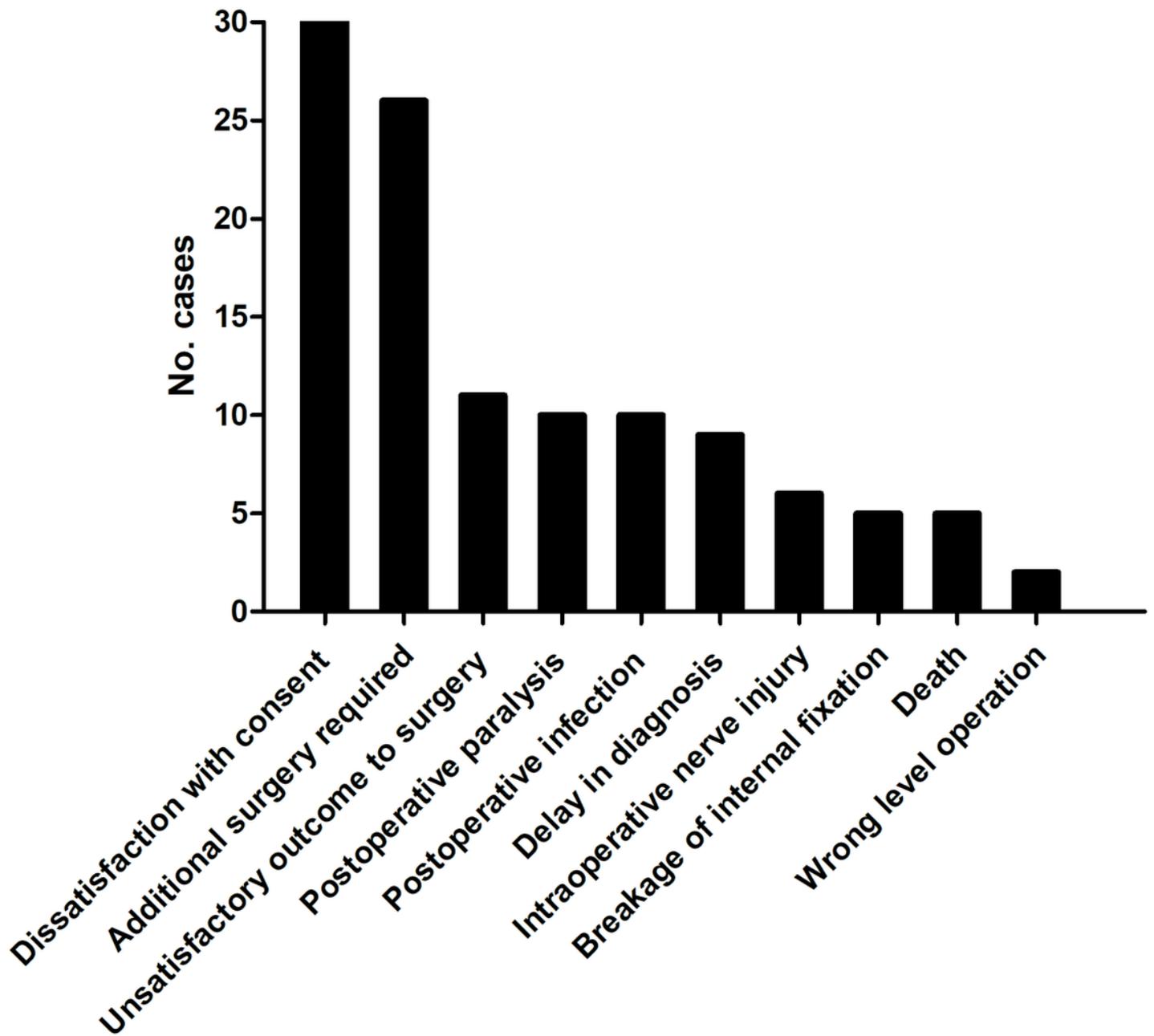


Figure 2

Number of cases for each reason that led to a malpractice claim following spine surgery

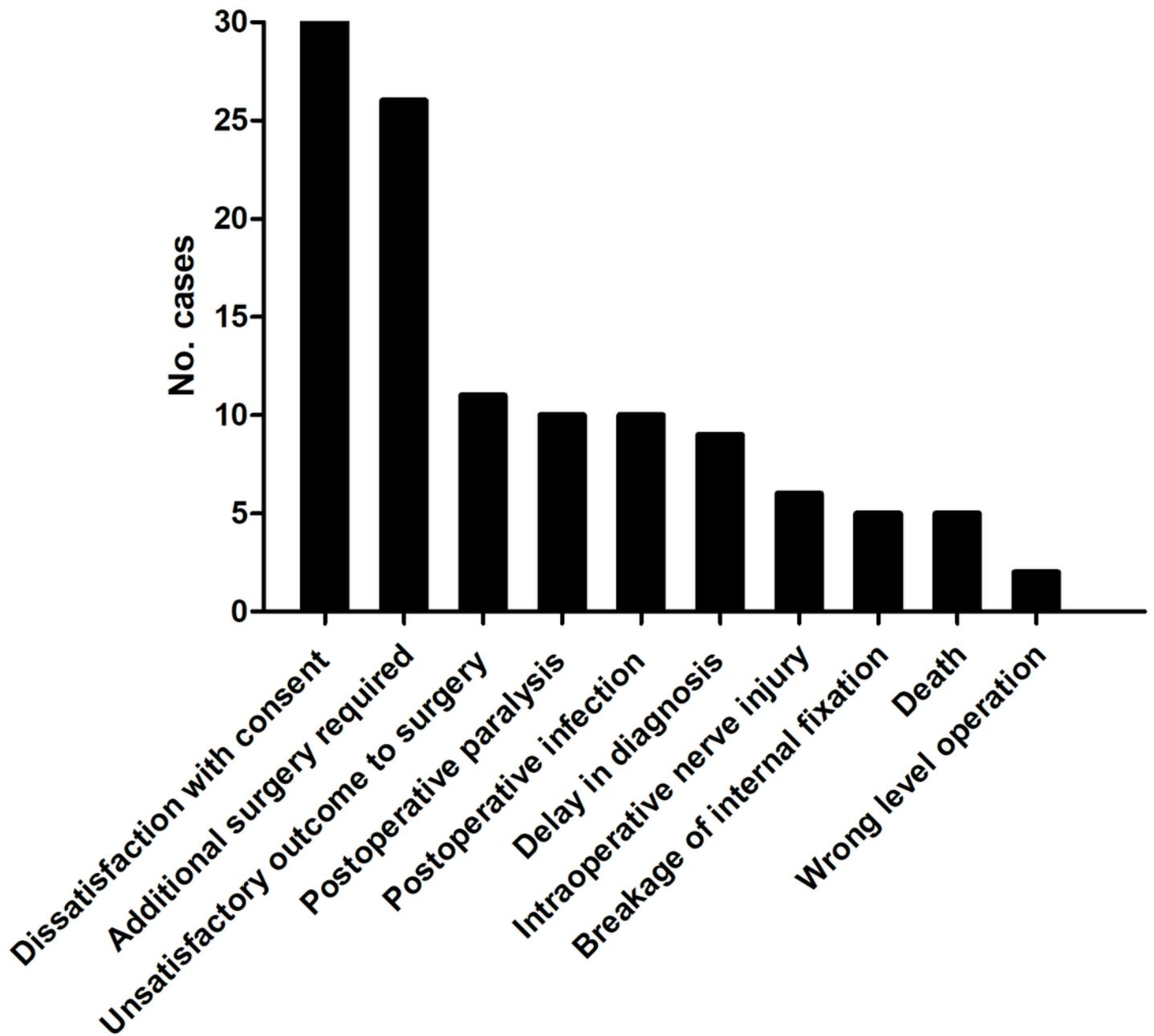


Figure 2

Number of cases for each reason that led to a malpractice claim following spine surgery