Revista Española de Medicina Legal 49 (2023) 101–106

ASOCIACIÓN NACIONAL DE MÉDICOS FORENSES

Spanish Journal of Legal Medicine
Revista Española de Medicina Legal

www.elsevier.es/mlegal

ORIGINAL ARTICLE

Neurosurgery and litigation: An observational study of liability for damages in public neurosurgical practice in Spain☆,☆☆

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Received 25 October 2022; accepted 15 December 2022
Available online 3 November 2023

KEYWORDS
Neurosurgery;
Negligence;
Defensive medicine;
Medical responsibility;
Rulings

Abstract
Background and objective: Neurosurgery has been internationally considered a "high risk" specialty for lawsuits. The aim of this observational study was to analyse the characteristics of medical liability judgements in Spain for damages caused by the practice of neurosurgery in Spanish public healthcare.
Materials and methods: Cross-sectional observational study analysing the rulings handed down in the contentious-administrative jurisdiction by the High Courts of Justice in the period 2008–2020, in the specialty of neurosurgery. The variables were administrative, clinical, judicial, and compensatory.
Results: A total of 1015 rullings were analysed, of which 38 (3.74%) were related to neurosurgery. A total of 51.85% of the judgements were dismissed at first instance and 88.88% at second instance. The most frequent reason in the judgements upholding the compensation requested by the patients was lack of information: 8 (53.33%). The most frequently claimed damage was sequelae: 31 (81.57%). The medical activity most related to the claims was spinal surgery: 23 (60.52%). The median award was 40 000 euros, with a range of 5000–78 285 euros.
Conclusions: In the Spanish public health system, the specialty of neurosurgery is not among the most demanded. Most of the rullings (60%) reject the compensation requested and, therefore, are favourable to the health services. In the case of an upheld decision, lack of information is the most frequent reason for breach of the lex artis. These data contribute to improving the knowledge of professionals in the medical-legal aspects of healthcare and invite the formulation of further studies contrasting the Spanish data with those of other countries.

☆ Please cite this article as: Hernández-Herrero M, Cayón de las Cuevas J. Neurocirugía y judicialización: estudio observacional de la responsabilidad por daños provocados en la práctica neuroquirúrgica pública en España. Revista Española de Medicina Legal. 2023. https://doi.org/10.1016/j.reml.2022.12.001.

☆☆ Article produced within the framework of the NVAL 18/04 project: "Gene-ethics and Neuro-ethics: implementation of a bio-legal and bioethical framework for biological and bionic enhancement treatments on human beings".

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PALABRAS CLAVE
Neurocirugía;
Negligencia;
Medicina defensiva;
Responsabilidad médica;
Sentencias

Neurocirugía y judicialización: estudio observacional de la responsabilidad por daños provocados en la práctica neuroquirúrgica pública en España

Resumen
Antecedentes y objetivo: La neurocirugía ha sido internacionalmente considerada una especialidad de "alto riesgo" de demanda judicial. El objetivo de este estudio observacional radicó en analizar las características de las sentencias sobre responsabilidad médica en España por daños provocados en la práctica de la neurocirugía en la asistencia sanitaria pública española.
Materiales y métodos: Estudio observacional transversal que analizó las sentencias dictadas en la jurisdicción contencioso-administrativa por los Tribunales Superiores de Justicia en el período 2008–2020, en la especialidad de neurocirugía. Las variables fueron administrativas, clínicas, judiciales e indemnizatorias.
Resultados: Se analizaron 1.015 sentencias, de las cuales 38 (3,74%) se refirieron a neurocirugía. El 51,85% de las sentencias fueron desestimatorias en primera instancia y el 88,88% en segunda instancia. El motivo más frecuente en las sentencias estimatorias de la indemnización solicitada por los pacientes fue el déficit de información: 8 (53,33%). El daño más reclamado fueron las secuelas: 31 (81,57%). La actividad médica más relacionada con las demandas es la cirugía de la columna: 23 (60,52%). La mediana de las indemnizaciones fue 40.000 euros, con un intervalo de 5.000–78.285 euros.
Conclusiones: En la sanidad pública española la especialidad de neurocirugía no se encuentra entre las más demandadas. La mayor parte de las sentencias (60%) son desestimatorias de las indemnizaciones solicitadas y, por tanto, favorables a los servicios de salud. En caso de estimación, la falta de información es el motivo más frecuente de infracción de la *lex artis*. Estos datos contribuyen a mejorar el conocimiento de los profesionales en los aspectos médico-legales de la asistencia sanitaria e invitan a la formulación de ulteriores estudios que contrasten los datos españoles con los de otros países.

Introduction

There is world-wide recognition of neurosurgery as a high-risk specialty, namely the possibility of a malpractice lawsuit. According to Jena et al.,[1] 20% of all neurosurgeons in the USA face a malpractice lawsuit each year, well above the usual average for all other specialties of 7.4%. Because of this litigious environment, there is a recognised high level of concern about all aspects of medical liability claims. A consequence of this concern is the fear of a lawsuit, which in turn encourages the practice of defensive medicine. Defensive medicine is defined as the performance of unnecessary diagnostic tests or treatments (positive defensive medicine) or the rejection of risky patients (negative defensive medicine).[2] In a survey of 1028 US neurosurgeons regarding defensive practices, 72% ordered imaging tests, 67% ordered laboratory tests, and 66% consulted with other specialists solely as a defensive mechanism.[3]

Most studies on medical malpractice are conducted in the English speaking environment. Although the scenario is different from the Spanish one, both in terms of the healthcare system and the judicial system, the concerns of medical professionals and managers about liability are universal. Medical malpractice in Spain has rarely been the subject of study in public health in the field of neurosurgery.[4] This research aims to determine the characteristics of judgements for financial liability in the speciality of neurosurgery. We argue that empirical knowledge of medical malpractice can contribute to framing the role of claims in this speciality, as well as minimising the fear of a lawsuit.

Method

This was a cross-sectional observational study of judgements on healthcare liability in the High of Justice (Administrative Courts) in Spain, handed down from January 2008 to August 2020. Criminal and civil jurisdiction are excluded for different reasons, the former dealing with actions or omissions constituting a criminal offence and the latter with private healthcare. Supreme Court rulings were excluded as access to cassation is severely restricted, such that their inclusion would produce clear biases in the results.

From a methodological point of view, both first and second instance rulings are included. In this regard, it should be borne in mind that, depending on the case, the High Courts of Justice may rule in first and only instance or in second instance when the case has been previously settled by a lower court (Administrative Court). The variability of one or the other case depends on the amount claimed and the body of the health administration that is competent to resolve the prior claim. It should also be pointed out that, in

liability claims in the field of public healthcare, only the corresponding health administration can be sued and not directly the professional involved in the case.

The analysis of the judgements was carried out using the public database CENDOJ (Judicial Documentation Centre). The search key was healthcare liability, obtaining a first group of 11 767 judgements.

The variables studied and collected through a data sheet by year are classified into 4 sections: (a) administrative: instance, appellant; (b) clinical: age of the patient, action, medical activity involved, speciality; (c) judicial: damage claimed, reason for the judgement, medical activity involved in the judgements and ruling; and (d) amount of compensation.

The sample size was obtained through the Granmo 7.12 programme. Since there is no previous data on the prevalence of sentences, an estimated proportion of $P = .50$, confidence level of 95% and precision of 5% was taken with a result of at least 350 sentences. In order to increase the reliability of the data, it was decided to extend the sample to 1015 sentences by applying systematic sampling with analysis of every 8th sentence. There were 3 inclusion criteria: (i) clinical motivation of the judicial pronouncement, (ii) consequences for the patient, and (iii) amount of compensation. The following were excluded: (i) judgements that merely reject the claim for formal reasons (e.g., limitation period for claiming); (ii) judgements in which more than one speciality was involved; (iii) judgements arising from claims in which only the insurance company has been sued; and (iv) judgements not related to the object of the study.

Descriptive statistics are shown for the categorical variables by absolute values, percentages, and 95% confidence interval and for the quantitative variable by median and interquartile range. For the quantitative variable, the type of distribution was previously checked by means of the Kolmogorov–Smirnov Z-test, for the comparison of qualitative data by means of chi-square, contingency table or Student's *t*-test as appropriate. For comparison of quantitative variable with qualitative variables, the Mann–Whitney U test or the Kruskal–Wallis test was used as required. *P* values < .05 wereconsidered significant. The data are analysed with IBM SPSS Statistics version 24 (Licence Python 2.7.6. and 3.4.3.).

Results

Of the 1015 claims, the speciality of neurosurgery was found to be involved in 38 cases (3.74%; CI 2.66–5.10). At first instance, there were 27 cases (71.05%; CI 54.9–84.57) and at second instance, 11 (28.94%; CI 15.42–45.90). In the second instance if the appellant was the patient and/or family, 9 cases were obtained (81.81%; CI 48.22–97.71) and if the appellant was the health service and/or the insurer, 2 cases were obtained (18.18%; CI 2.28–51.77).

Within the clinical variables, all appellants were of legal age, 38 cases (100%). The action was non-urgent in most cases, 34 (89.47%; CI 75.19–97.05). The medical activity involved was mostly spinal surgery, 23 cases (60.52%; CI 43.38–75.96), vascular techniques, 3 cases (7.89%; CI 1.65–21.37), polytrauma care, 3 cases (7.89%; CI 1.65–21.37), and others, 9 cases (23.68%; CI 11.44–40.24). Table 1 shows the administrative and clinical variables.

Table 1 Results of the administrative and clinical variables.

Administrative variables	N (%)	95% CI
Instance		
- First	27 (71.05)	54.9–84.57
- Second	11 (28.94)	15.42–45.90
Appellant		
- Patient and/or family	9 (81.81)	48.22–97.71
- S.S. and/or insurerd	2 (18.18)	2.28–51.77
Clinical variables	**N (%)**	**95% CI**
Action		
- Emergency	4 (10.52)	2.94–24.80
- Non emergency	34 (89.47)	75.19–97.05
Medical activity involved		
- Spinal surgery	23 (60.52)	43.38–75.96
- Vascular technique	3 (7.89)	1.65–21.37
- Polytrauma care	3 (7.89)	1.65–21.37
- Others	9 (23.68)	11.44–40.24

Among the judicial variables, the most frequent harm claimed was sequelae in 31 cases (81.57%; CI 65.67–92.25) and death in 7 cases (18.42%; CI 7.74–34.32).

Of the 38 judgements, breaches of good clinical practice (lex artis) were found in 15 cases (39.47%; CI 24.03–56.61–78.73), for the following reasons: lack of information in 8 cases (53.33%; CI 26.58–78.73); diagnostic and/or treatment malpractice in 5 cases (33.33%; CI 11.82–61.62); and loss of opportunity in 2 cases (13.33%; CI 1.65–40.46). The medical activities involved in the judgements with violation of good clinical practice were: spinal surgery in 13 cases (86.66%; CI 59.54–98.34), polytrauma care in 1 case (6.66%; CI 0.16–31.94) and other in 1 case (6.66%; CI 0.16–31.94) (Fig. 1).

For the variable first instance decision (27) failure, 14 cases were dismissed (51.85%; CI 31.95–71.33), 13 cases were partially upheld (48.14%; CI 28.66–68.05). We found no total estimates. In second instance (11) when the appellant was the patient and/or the family (9), 8 cases were dismissed (88.88%; CI 51.75–99.71) and 1 case was partially upheld (11.11%; CI 0.28–48.25). When the appellant was the health service and/or the insurer (2), 1 case was dismissed (50%; CI 1.25–98.74) and 1 case was fully upheld (50%; CI 1.25–98.74).

The median compensation amount was 40 000 euros (RIC 44 000), with a minimum of 5000 euros and a maximum of 78 285 euros (Fig. 2).

Discussion

It is worth noting that the main features of the judgements studied are: (a) they all refer to patients of legal age; (b) most of them occur in a non-urgent context; (c) the medical activity most involved in judgements involving infringement of good clinical practice (lex artis) is spinal surgery; (d) lack

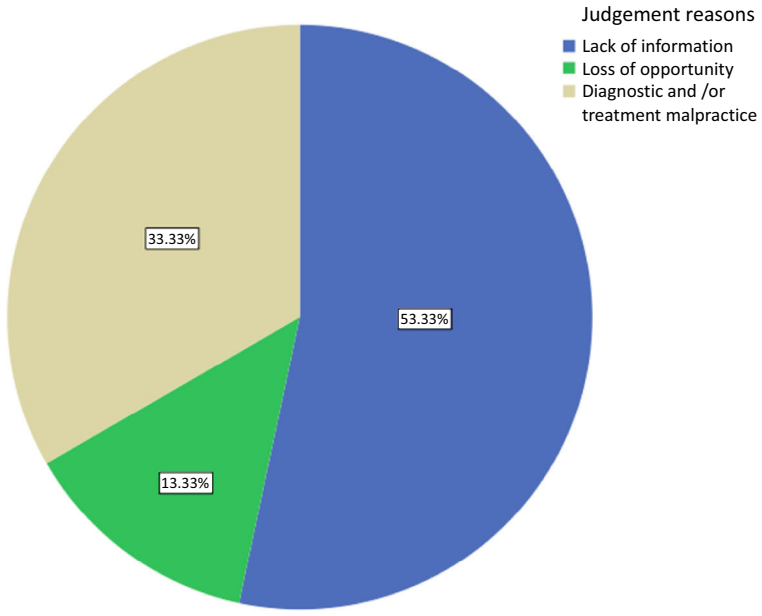

Fig. 1 Medical activity involved in judgements involving infringement of good clinical practice (*lex artis*).

of information is the most frequent reason for upholding judgements; and (e) 60% are dismissed, i.e. in favour of the administration.

In our study, we found that the speciality of neurosurgery was involved in 38 cases (3.74%). This figure places it in 8th place in order of frequency of medical liability claims in the public health system. This figure is difficult to compare with existing studies due to methodological differences. However, in a study in the USA, we found that neurosurgery is the most prone to a liability claim.[1] Another US study analysing 280 368 paid medical malpractice claims between 1992 and 2014 found that the specialty of neurosurgery had the highest incidence of paid medical malpractice claims, 53.1 per 1000 physicians/year.[5]

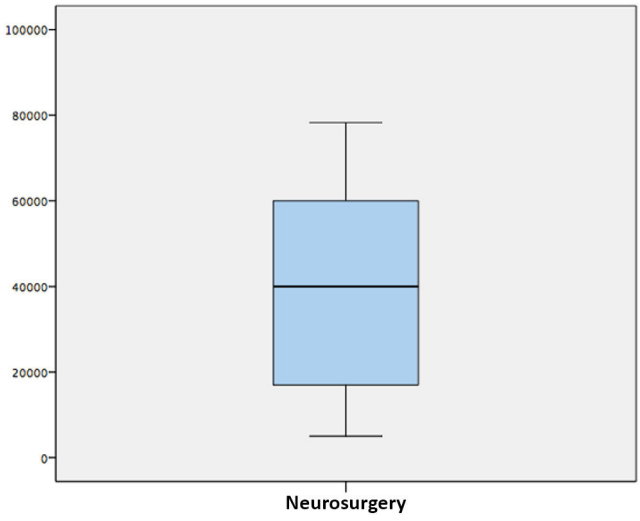

Fig. 2 Compensation amounts in the speciality of neurosurgery.

In Spain, we found one study that claims that neurosurgery is not among the 10 most complained-about specialities.[6] Another study, which analysed 18 183 judicial (civil, criminal, administrative, or social) and extrajudicial claims between 2000 and 2018 in Catalonia, placed the speciality of neurosurgery in 16th place, with 1.67% of the claims.[7] We can observe that our results are similar to those found in other studies in Spain, although our work only focuses on the contentious-administrative jurisdiction and does not include other jurisdictions.

In relation to the harm claimed in the lawsuits, the judgements refer mainly to sequelae, 81.57%, and death accounts for 18.42%. A study carried out in Spain analysed 61 judgements from 1995 to 2007 in the second instance and found that death was the result in 22%,[8] similar to our own data. However, there are differences with other specialities such as emergency medicine, where death is claimed in 46.1% of case,[9] and cardiology and cardiovascular surgery, where death is claimed in 44.68% of cases.[10]

One of the key findings of our study is that 60% of the judgements were dismissed, i.e. they were favourable to the administration. Specifically, in the case of the first instance, 50% were dismissed and in the second instance, if the appellant was the patient and/or their relatives, almost 90% were dismissed. It should be pointed out that there is no total or full dismissal in favour of the patient and/or family members. Thus, from our point of view, these results support the idea that defensive medicine is a disproportionate response to the fear of a possible lawsuit, as the resolution is in favour of the administration in 60% of the cases. An US study analysing 343 cases from 1985 to 2015 found that 27.1% of the judgements were in favour of the plaintiff, 48.1% were in favour of the defendant, and 23.6% were settled.[11] An analysis of 61 lawsuits against neurosurgeons in Spain from 1995 to 2007 at second instance found no

malpractice in 56.7%.[7] However, in this case, both civil, criminal, and administrative rulings were analysed and included Provincial Courts, High Courts of Justice and the Supreme Court. The data obtained in our study are congruent with those found in other studies. If we compare the results obtained, in terms of the judgements with other specialties, we find that the percentage of dismissals in neurosurgery is similar to specialties such as emergency medicine[9] and somewhat lower than in the case of cardiology and cardiovascular surgery.[10] The positive finding regarding the outcome of the judgements does not mean that we underestimate the consequences for physicians who are involved in legal proceedings, e.g. burnout[12] 2 or the considerable psychological impact.[13] However, these results do help to frame the widespread idea of overestimation of the risk of a lawsuit,[14] which results in the practice of defensive medicine. A survey study of 1026 neurosurgeons in the US, which aimed to examine the relationship of state liability environment to the practice of defensive medicine, found that neurosurgeons were 50% more likely to practice defensive medicine in states where neurosurgery was considered high risk.[15]

Defensive practices are now widespread throughout the world. However, their study is complex and incomplete, as it is mostly survey-based. The consequences of defensive medicine are highly negative for the patient, the healthcare system and the professional, due to, e.g. overuse.[16] We have not found any studies in Spain in relation to defensive practices in neurosurgeons. At an international level, in a survey study to which 490 neurosurgeons responded, almost 40% were concerned about always or frequently being sued. In relation to whether there had been changes in their clinical practice due to this concern, 77.4% answered in the affirmative.[17]

The medical activity most implicated in the judgements is spinal surgery (60.5%). This result is consistent with a study carried out in the USA in which around 60% of malpractice cases in this speciality were related to this surgical activity.[18] In an investigation carried out in England over a period of 10 years, 794 cases in the speciality of neurosurgery were analysed and most of them were also related to spinal processes, 44.1%.[19] The studies show that although there is a high potential risk of litigation in this speciality, most of the claims relate to elective spinal surgery.[20,21]

Another notable finding of this study is that the most frequent reason for breach of lex artis is lack of information: 50.3%. The lex artis is the criterion of correct clinical practice required of professionals, which must be in accordance with the state of science and the available means (lex artis ad hoc). Even if there is a harm, if it has been done in accordance with the lex artis, there is no liability.[22] Obtaining informed consent is considered part of the lex artis. Therefore, a deficit or absence in the care process implies an irregular act in breach of the lex artis. However, damage must be caused by the lack of information for there to be compensation.[23] In our study, this finding is a differential fact, given that the most frequent reason for malpractice in general is the lack of diagnosis and/or treatment.[24] In relation to other studies, we note that a study of 15 years of judgements in Japan found that lack of consent accounted for 26.9% of the judgements upholding the claim.[25] In our opinion, the data obtained in our study is highly significant since it may constitute a very interesting area for improvement. Information can be provided in an adequate manner and thus avoid most liability claims.

The median compensation award is €40 000, a figure well below those reported in international studies. In a study in the USA from 1992 to 2014, the median payout was $469 222 in the specialty of neurosurgery, with an increase over the period studied of 9.4%[4] and in another study, the median payout was found to be $344 811.[1] These figures are well above the results of our study. However, it should be borne in mind that half of the judgements upheld are for information deficits. In this sense, a study in the United Kingdom from 2004 to 2013 calculated the amounts due to lack of information at 77 000 pounds, a figure that is closer to our results.[26]

The main limitation of this study is that it refers to the judicial channel, specifically, judgements at the level of the High Courts of Justice of the Contentious-Administrative Chamber. This means that claims in extrajudicial, civil, and criminal proceedings are excluded.

The results of our research point to 3 main conclusions. The first is that the speciality of neurosurgery is in 8th place in order of frequency of demand in the public health system. Given the comparison with other countries, and even with the few studies in Spain, we can conclude that the speciality of neurosurgery is not among the most demanded specialities in the public sector. The second is that most of the rulings are dismissive of the patient's claim, i.e. in favour of the administration. This means that, even in the case of a liability claim, most of the time they are dismissed. The third conclusion is that more than half of the claims upheld in favour of the patient have to do with information deficit, as opposed to the usual ground of malpractice in relation to diagnosis and/or treatment.

We argue that knowledge of these results may contribute positively to improving the performance of neurosurgeons in relation to specific medico-legal issues related to their specialty. Moreover, our findings may help to implement areas of improvement in the care process to avoid the perceived risk of legal action. In turn, they may stimulate the reduction of defensive medical practices and their negative consequences.

Key points

What is known?

Medical liability is a cause for concern in the healthcare system, including for managers and doctors. However, its study so far in Spain is very limited. The perception of the risk of being sued is higher than the reality, which results in an excessive number of treatments and tests or the avoidance of high-risk patients. These practices constitute defensive medicine, not only have very harmful effects, but also do not give the practitioner any protection against the risk of a lawsuit. In this context, the speciality of neurosurgery is particularly relevant as it is considered to have a high risk of lawsuits at international level.

What does this paper contribute?

This research shows the characteristics of medical liability claims in the public sphere in the speciality of

neurosurgery which, in contrast to what happens internationally, is not among the most sued specialities in Spain. Indeed, most of the judgements are favourable to the public health services. Paradoxically, in the few cases of judicial condemnation, lack of information is the most frequent reason for infringement of good clinical practice (lex artis ad hoc).

From a medico-legal perspective, this study provides fundamental tools for professionals, given that greater knowledge of these issues can help to mitigate the fear of lawsuits and, as a consequence, reduce defensive medical practices.

Funding

There is no type of funding.

Conflict of interests

There are no conflicts of interest.

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