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State appellant cases for testicular torsion: Case review from 1985 to 2015

Thomas W. Gaither and **Hillary L. Copp**

Department of Urology, University of California, San Francisco, CA, USA

Summary

Objective—Testicular torsion is one of the most common diagnoses involved in lawsuits in the pediatric patient. Missed diagnosis and diagnostic delays put patients at risk for testicular loss and have resulted in malpractice litigation. Using a national database, we sought to describe testicular torsion malpractice cases tried at the state and federal level and investigate factors associated with successful defense by the provider.

Method—We reviewed the Lexis Nexis academic legal database. We searched all cases using the terms “testicular torsion” and “medical malpractice” from 1985 to 2015. From this search, we compiled various medical and legal aspects of the case including the outcome of the trial. We performed multivariate logistic regression to determine which factors were associated with successful defense at the state level.

Results—Fifty-three malpractice cases of testicular torsion were included. State appeals were in favor of providers in 26 (50%) of cases. The average time between initial presentation of the patient and the state verdict decision was 5 years. Emergency room (ER) physicians were the most common provider sued (35%). Approximately half of the patients (26, 51%) first presented to the ER, and atypical presentations were common, as 16 (31%) presented with abdominal pain only. The proportion of patients with false-negative ultrasounds was 16 of 25 (64%). If the patient first presented to the ER, the doctor was less likely to have a successful defense (OR = 0.23; 95% CI 0.06–0.79]). Most verdicts (8/9, 89%) were in favor of urologists. One urologist lost at the state level because of delayed time to the operating room.

Conclusions—Atypical clinical presentations and false-negative ultrasound findings are common in testicular torsion malpractice litigation at the state and federal level. Providers who used ultrasound were not more likely to win the state appeal, and providers whose patients presented to the ER were less likely to have a successful defense. Although 50% of providers won the state appeal, the time from initial patient presentation and final state verdict decision was substantial.

Keywords

Testicular torsion; Malpractice; Ultrasound; Litigation

Correspondence to: H.L. Copp, Department of Urology, University of California, San Francisco, 400 Parnassus Avenue, Suite A-610, San Francisco, CA 94143-0330, USA, Tel.: +1 415 476 1611; fax: +1 415 476 8849, Hillary.copp@ucsf.edu (H.L. Copp).

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Introduction

Testicular torsion is a common urological emergency with an incidence rate of 3.8 per 100,000 person-years [1]. Unfortunately, the morbidity due to testicular torsion is quite severe, as estimates for testicular loss range from 31.9% to 41.9% [1,2]. Misdiagnosis of testicular torsion may lead to treatment delay and subsequent testicular loss. Such patients with testicular loss because of misdiagnosis have proceeded to successful medical litigation [3]. In fact, testicular torsion is one of four emergency diagnoses that are most common for litigation among the pediatric patient population [4,5]. Studying malpractice litigation may improve patient safety, although views of this issue are mixed [6].

Although litigation for testicular torsion is common, very few studies have addressed this issue in detail. To date, only two studies have explored testicular torsion malpractice cases, each exploring different levels of the US judicial system (county versus state) [7,8]. One study found that litigation focused mostly against urologists at the county level [7]. A more recent study found litigation focused mostly against emergency room physicians at the state level [8]. Although these studies are informative, they are mostly descriptive. Additional models are needed in order to best inform physicians, in particular urologists and ER physicians, which practices are most defensible. Prevention of successful litigation, as well as defensible medicine, are often indicators of good medical practice [9].

Thus, we aim to review state and federal malpractice litigation for testicular torsion. In particular, we seek to discover which factors around testicular torsion litigation are protective for physicians, and thus allow for a successful appeal at the state and federal level. The ultimate goal of this study is to help providers identify and avoid events that often lead to malpractice claims while simultaneously emphasizing best practices for patients with testicular torsion.

Materials and methods

We used the LexisNexis *Academic* legal search database, which contains all state and federal cases from January 1790 to today. The database contains source material as case law and reviews from all US Supreme Court decisions and state court decisions from all 50 states [10]. Cases of malpractice usually present at a county level court. If one party in the lawsuit (plaintiff or defendant) appeals the court's decision, these cases then move to a state-level court, which is then captured in the LexisNexis database [10]. Surgical outcomes from malpractice litigation using the LexisNexis *Academic* legal database have been described elsewhere [9].

We searched the database for cases using the term “testicular torsion.” Each case was individually reviewed. Only cases that were against a medical provider were included. Cases that were for worker's compensation, disability, or against another person or institution other than a hospital were excluded from the analysis. Each case was independently reviewed for several factors, including age of patient, parental involvement as the plaintiff, the type of hospital sued (community or academic), number of providers being sued, type of provider sued, as well as the date of presentation and date of the verdict. Medical aspects of each case

were reviewed for place of initial presentation, other presumed diagnosis, whether an initial ultrasound or computed tomography (CT) were performed, and the claimed error in medical practice usually provided by expert medical witnesses. False-negative ultrasound results correspond to documented blood flow in the presence of a presumed testicular torsion event. The cases were also reviewed for whether the state and federal verdict was in favor of the plaintiff or the defendant. Although cases were in a uniform format, each case varied in how much detail was provided.

Summary statistics were performed using frequencies and proportions. Unadjusted associations were tested between predictor variables and the outcome variable (successful defense by provider) using univariate logistic regression. We performed multivariate logistic regression to identify factors associated with successful defense of the provider. Covariates with $p < 0.20$ were included in the final model. All analyses were completed in Stata, version 13.1.

Results

Ninety-four cases populated using our search terms. After independent review, 53 original cases against providers were included in the analysis. The date of verdict decisions for all cases ranged from 1986 to 2015. The average time between the dates of initial presentation of the patient to the date of the verdict decision was 4.99 ± 2.90 years (mean ± SD). Cases ranged from all over the United States, as a little over half of the states (26/50) had at least one case. No federal cases of testicular torsion were reported.

Basic characteristics about each case can be found in Table 1. The average age of the patient was 15.4 ± 10.4 years (mean ± SD). Parents were involved as the plaintiff in a little under half of the cases, 24/53 (46%). Seventy-two providers were sued in total, or about 1.4 sued providers per case. Emergency room physicians were the most common provider sued, 25 of 72 (35%). Nine urologists (13%) were sued overall. The hospital was involved with a provider in 20 of 53 (28%) of cases. The state appeal favored the provider in 26 of 50 (50%) of cases. The average settlement for loss at the final verdict was $491,421, median $305,678. Most claims for malpractice included missed diagnosis and negligence, 52 of 53 (98%).

Medical aspects of the cases are presented in Table 2. Most patients (26/53; 51%), initially presented to the emergency room. Atypical presentations were common as 15 of 53 (31%) presented with abdominal pain only. The prevalence of ultrasound and CT scans on first presentation was 25 of 53 (48%) and six of 53 (12%), respectively. Most initial ultrasounds (16/25; 64%) had false-negative results. Most patients had testicular loss (46/53; 88%). Half of providers diagnosed patients with epididymitis on first presentation (24/44; 52%). The most common claims for a breach of the standard of care was a delay for a referral to the emergency room (13/52; 25%) and failure to do a testicular examination on first presentation (10/52; 19%).

Unadjusted and adjusted odds ratios for the outcome of a successful defense for the provider at the state appeal are shown in Table 3. The type of doctor (OR = 0.59; 95% CI 0.19–3.38), whether the hospital was sued (OR = 0.56; 95% CI 0.18–1.71), or whether an ultrasound

was performed on first presentation (OR = 0.99; 95% CI 0.33–2.95) were not associated with the doctor having a successful defense. Providers whose patients presented to the hospital were less likely to win the state appeal than providers whose patients did not present to the hospital (OR = 0.23; 95% CI 0.06–0.79). Providers who incorrectly diagnosed patients with epididymitis were not more likely to win the state appeal (OR = 2.82; 95% CI 0.78–10.3) than providers who incorrectly diagnosed patients with other diagnoses. Providers who delayed in consulting urology were not more likely to win the state appeal (OR = 0.28; 95% CI 0.02–3.36).

Discussion

This study is a retrospective review of testicular torsion malpractice cases from 1985 to 2015 at the state and federal level in the United States. The study contains all cases that reach this level in our legal system. Our findings show that a range of providers is litigated in cases of testicular torsion. A significant amount of time lapses between the initial presentation of the patient and the outcome of the trial. Most patients in this population have atypical clinical presentations, and false-negative ultrasound findings are common. Providers whose patient presents to the hospital are more likely to lose the state appeal. Providers who used ultrasound on first presentation were not more likely to have a successful defense.

Our results coincide greatly with the Colaco et al. findings [8]. This group used the Westlaw legal database, which also looks at state and federal cases. However, important differences should be noted. Although we also found that emergency medicine physicians were most commonly sued, we found family physicians and nurses to outnumber urologists. This discrepancy many be due to the way data was extracted or differences in what is available in the two databases. We included all providers who were sued even if there was more than one, which was a common occurrence. At the county level, the Matteson et al. [7] findings suggest that urologists are most commonly sued, at least in the state of New Jersey. It is possible that our findings do not show as many urologists because of settlement at the county level, or fewer urologists appeal county decisions to bring the case to a state court. However, from our findings and those of Colaco et al., of the urologists who appeal, most have a successful defense.

Patients in testicular torsion malpractice cases have been shown to be older than non-malpractice cases of torsion [7]. We confirm these results, as the average age in our population was 15.4 (range 2–47) years. Because the peak age range for testicular torsion is from 7 to 14 years [1], testicular torsion might be lower on the differential diagnosis list for older males presenting with testicular pain. This could contribute to missed diagnosis and a delay to treatment. Parental age has been shown to be inversely related to delay in presentation [11]. We are the first study to show parental involvement in testicular torsion malpractice cases. Although parents are involved about half of the time, it does not seem that parental involvement had an effect on the trial outcome, at least on the state level. In our study, a successful defense was not associated with providers being sued by parents compared with providers being sued by patients only (OR = 0.65, $p = 0.51$) (Table 3).

Most medical malpractice claims that are due to medical errors are more likely to be compensated than those claims not thought to be due to error [12]. The average settlement costs in testicular torsion cases has been reported at $60,191, and most liabilities in such claims came from missed diagnoses and improper referrals [7]. Settlement charges in our study are substantially higher than those previously reported. This may be due to rising costs in medical malpractice in general [12], or that cases that show up to the state court level have larger settlement claims. Interestingly, 50% of providers won state appeals, and thus no payments were made in these cases at the county or state level. In the US justice system, litigants may file for an appeal to challenge a lower court decision. In a recent study, it was estimated that around 16% of malpractice cases are brought to a state appeal, and in roughly 23% of those cases the decision of the lower court was reversed [13]. However, beyond monetary costs, what is understudied in the medical malpractice literature is the true costs of providers' time throughout this process [14]. In our study alone, the average time between initial presentation of the patient and the state verdict decision was 5 years. More research is necessary to uncover the hidden costs of malpractice even if there is a successful defense of the provider.

Sound medical practice is often defensible, although the use of guidelines to prevent medical malpractice is under debate [15,16]. Our findings suggest that several situations around testicular torsion deserve mentioning. First, along with the two other studies [7,8], atypical presentation of torsion is common in the malpractice population. Referred pain to the abdomen can occur in testicular torsion and may be an overlooked symptom [17]. As such, a thorough testicular examination in young boys and men presenting with abdominal pain is necessary to avoid diagnostic delay of possible testicular torsion. Second, ultrasound is not protective of malpractice litigation, nor is ultrasound always sufficient to rule out testicular torsion. Around 48% of providers used ultrasound in our study at initial presentation, and 64% of those showed false-negative results. Providers who used ultrasound were not more likely to win the state appeal (Table 3). These results are consistent with the Colaco et al. [8] study, and other evidence suggests that Doppler ultrasound is not 100% sensitive for torsion, as false-negative results do occur [18]. Third, immediate urological consultation is necessary in patients with suspected torsion. In our study, providers whose patients presented to the hospital were 0.28 times as likely to win the state appeal compared with providers whose patients presented elsewhere. Perhaps court systems are less forgiving when patients present to a hospital, where surgical consultation might be more accessible. Testicular salvage rates are 85–97% if operated on within 6 h of the initial symptoms [19]. Although the time to consultation has not been shown to be directly related to testicular loss [20], early involvement of urology is recommended.

This study should be interpreted in the context of certain limitations. The LexisNexis database does lack some clinical variables such as physical examination findings. Other factors that might affect malpractice litigation, such as demographic characteristics of the plaintiff or the role of provider counseling, were not available in the database. Whether a county case progresses to a state case might be a result of legal and financial reasons rather than on the basis of clinical findings. Also, settlements that were settled outside of court were not included in the analysis. Owing to a small sample size, comparative analysis might be missing true associations. Although this is a full sample of state and federal cases, these

cases might not be representative of all county cases in the United States. As legal systems differ substantially by country of origin, these results might be difficult to interpret outside the United States. How testicular torsion malpractice claims differ by country of origin is a potential subject of future research. Despite these limitations, we believe that this study adds significantly to the testicular torsion malpractice literature, as it shares the landscape of state litigation around a common disease process in the world of medical malpractice.

Conclusions

Atypical clinical presentations and false-negative ultrasound findings are common in testicular torsion malpractice litigation at the state and federal level. Providers who used ultrasound were not more likely to win the state appeal, and providers whose patients presented to the ER were less likely to have a successful defense. Although 50% of providers won the state appeal, the time from initial patient presentation and final state verdict decision was substantial.

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Table 1

Testicular torsion malpractice cases from 1985 to 2015.

	Cases (*n* = 53)
Age of patient, mean (range)	15.4 (2–47)
Who sued	
Patient only	28 (54%)
Patient and parents	24 (46%)
Average number of providers sued per case, mean (range)	1.4 (1–4)
Type of practitioner sued	
Emergency room physician	25 (35%)
Urologist	9 (13%)
Pediatrician	4 (6%)
Family practitioner	12 (17%)
Radiologist	7 (10%)
General surgeon	5 (7%)
Nurse	10 (14%)
Hospital sued	
Yes	20 (28%)
No	33 (62%)
County verdicts in favor of	
Plaintiff	11 (26%)
Defendant	31 (74%)
State appeal in favor of	
Plaintiff	26 (50%)
Defendant	26 (50%)
Plaintiff	9 (27%)
Defendant	24 (73%)
Total awards/settlement	$491,421 ($305,678)
Claim for malpractice	
Missed diagnosis/negligence	52 (98%)
Improper surgery	1 (2%)

Note. Missing data are excluded from the table.

Table 2

Medical aspects of testicular torsion malpractice cases from 1985 to 2015.

	Cases (*n* = 53)
Place of first presentation	
Emergency room	26 (51%)
Pediatrician	7 (14%)
Family practice	2 (4%)
Consult in hospital	1 (2%)
Jail health	14 (27%)
Other clinic	1 (2%)
Initial symptom	
Testicular pain	25 (48%)
Abdominal pain	16 (31%)
Both testicular and abdominal pain	3 (6%)
Swollen testicle only	8 (15%)
Was an US ordered on first presentation?	
Yes	25 (48%)
US blood flow to testicle	
Blood flow	16 (64%)
No blood flow	8 (32%)
Unequivocal	1 (4%)
CT scan ordered on first presentation?	
Yes	6 (12%)
Other first diagnosis	
Epididymitis	24 (52%)
Non-specific testicular pain	7 (15%)
Musculoskeletal pain	4 (9%)
Testicular cancer/mass	2 (4%)
Constipation	2 (4%)
Appendicitis	1 (2%)
Kidney stone	1 (2%)
Postoperative pain	1 (2%)
Inguinal hernia	1 (2%)
Trauma/contusion	1 (2%)
Testicular loss	
Yes	46 (88%)
Represented to care	
Yes	44 (85%)
Transferred to another hospital	
Yes	2 (4%)
Breach of standard of care	
Delay to hospital admission	13 (25%)

	Cases (*n* = 53)
Failed to rule out torsion	10 (19%)
No testicular examination on first presentation	10 (19%)
Non-specific “missed diagnosis”	6 (12%)
Delay in consult to urology	5 (10%)
Post-surgical complication	2 (4%)
Too little imaging	2 (4%)
Unnecessary imaging	1 (2%)
Incorrect interpretation of US	1 (2%)
Urology delay to surgery	1 (2%)
Unnecessary surgery	1 (2%)

Note. Missing data are excluded from the table.

Table 3

Odds ratios for providers to have a successful defense at the state level.

	Univariate OR (95% CI for OR)	*p*	Multivariate OR (95% CI for OR)	*p*
Age of patient	0.99 (0.91–1.09)	0.90		
Urologist sued	0.59 (0.19–3.38)	0.76		
Parents sued[a]	0.42 (0.14–1.28)	0.13	0.65 (0.18–2.34)	0.51
Hospital sued	0.56 (0.18–1.71)	0.31		
Number of doctors sued	0.83 (0.40–1.75)	0.63		
US on first presentation	0.99 (0.33–2.95)	0.99		
CT on first presentation	0.5 (0.08–3.00)	0.45		
False-negative US	0.87 (0.18–5.46)	1.00		
Epididymitis other Dx[a]	2.72 (0.89–8.33)	0.08	2.82 (0.78–10.3)	0.12
Presented to hospital[a]	0.26 (0.08–0.83)	0.02	0.23 (0.06–0.79)	0.02
Presented twice	0.5 (0.11–2.35)	0.38		
Transferred hospitals	1.08 (0.06–18.3)	0.96		
Abdominal pain initial sx	0.44 (0.13–1.44)	0.17		
Delay in urology consult[a]	0.23 (0.02–2.21)	0.20	0.28 (0.02–3.36)	0.31

Dx: diagnosis; Sx: symptom.

[a]Variables were added to the multivariate model.

Table

State cases for testicular torsion by US census regions.

	Cases, *N* (%)	Years to final verdict, mean (SD)
Region		
Northeast	14 (26.4)	6.0 (4.1)
Midwest	7 (13.2)	3.6 (1.6)
South	23 (43.4)	4.9 (2.3)
West	9 (17.0)	4.5 (1.9)