Medicolegal Aspects of Iatrogenic Dysphonia and Recurrent Laryngeal Nerve Injury

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Abstract

Objective. To examine aspects of litigation involving iatrogenic dysphonia and injury to the recurrent laryngeal nerve in the adult population.

Study Design. Legal database review.

Setting. Medicolegal judicial system.

Subjects and Methods. Jury verdicts and settlement reports listing voice impairment or recurrent laryngeal nerve dysfunction as a primary injury in adult patients were identified in the Westlaw Database. Reports were examined for plaintiff demographics, defendant specialty, procedure performed, rates of settlements and verdicts, monetary awards, primary plaintiff symptoms, and common allegations.

Results. A total of 123 jury verdict and settlement reports were identified. General surgeons (24%), otolaryngologists (20%), and anesthesiologists (18%) were involved in the majority of cases. The procedure causing the alleged injury was primarily thyroidectomy (34%), followed by intubation (18%) and spinal instrumentation (10%). The majority of cases (70%) were decided in favor of the defendant. Where monetary awards were recorded, settlements and jury verdicts in favor of the plaintiff ranged between $4250 and $3,000,000, with a mean of $788,713. In addition to voice disturbances, complaints of dyspnea and dysphagia were commonly listed alleged injuries. The only factors associated with plaintiff verdicts were general surgery specialty (odds ratio, 6.3; 95% confidence interval, 1.7-23.2) and claims of loss of consortium (odds ratio, 8.5; 95% confidence interval, 1.2-60.7).

Conclusion. Dysphonia is a common complication in a number of procedures across multiple specialties. Although the majority of cases are decided in favor of the defendant, payments awarded can be considerable. Awareness of factors involved in these medical malpractice cases can help limit physician liability.

Keywords

malpractice, litigation, hoarseness, dysphonia, recurrent laryngeal nerve injury, medicolegal

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In this study, we sought to discover factors affecting settlements and verdicts of cases involving iatrogenic dysphonia and recurrent laryngeal nerve injury in adults, in the hopes of establishing awareness and inspiring management modifications for otolaryngologists and other physicians.

Materials and Methods

The Westlaw Legal Database (Thomson Reuters, New York, New York) is a publically available search engine containing information from federal and state court records. These records are maintained by various commercial vendors, some on a compulsory basis and some on a voluntary basis, varying by jurisdiction. In February 2014, a search was conducted for jury verdicts and settlements based on the terms “medical,” “malpractice,” “hoarse,” “hoarseness,” “dysphonia,” “voice,” “vocal cord,” “vocal chord,” and “laryngeal nerve.” Duplications, cases with plaintiff <18 years old, and cases with no iatrogenic injury resulting in either vocal impairment or laryngeal nerve injury were excluded, leaving 123 claims. Data were collected on plaintiff demographics, defendant specialty, procedure performed, rates of settlements and defendant/plaintiff verdicts, monetary awards, plaintiff symptoms, and common allegations. Approval by the Institutional Review Board was not required for this study, because all data were obtained through publically available records.

Probability modeling of a defense verdict versus a plaintiff verdict or settlement was performed with binary logistic regression, chosen because nearly all variables were reported as “yes” or “no.” The regression was undertaken in a forward stepwise fashion, with the addition of 1 variable at a time to maximize the adjusted correlation while maintaining individual variable significance. The final model was achieved when no further variables could be added to the model without compromising the adjusted correlation and variable significance. Odds ratios (ORs) and confidence intervals (CIs) were calculated from the variable coefficients within the final model. Significance was defined as \( P < 0.05 \) in all cases. All statistical analyses were performed using Microsoft Excel 2013 and Minitab 17 (Minitab Inc, State College, Pennsylvania).

Results

A total of 123 jury verdicts and settlements were found, with dates ranging from 1984 to 2013, originating from 32 states. California was the most represented state, with 20 cases (16%), followed by Pennsylvania with 14 cases (11%) and New York with 12 cases (10%). The average plaintiff age was 52 years old (range, 20-90 years). The majority of plaintiffs were women (77%).

Outcomes and Awards

Overall, 86 cases (70%) were decided in favor of the defendant; 25 cases (20%) were decided in favor of the plaintiff; and 12 cases (10%) were settled out of court (Figure 1). Indemnity payments, including settlements and jury verdicts in favor of the plaintiff, totaled $28,393,658, with a mean of $788,713 (range, $4250-$3,000,000). On average, settlements plus jury verdicts were $808,942 (range, $4250-$3,000,000). In 26 of 89 cases (29%) with vocal dysfunction as the primary alleged injury, the plaintiff received an average jury award or settlement of $740,638 (range, $4250-$1,835,400). In 25 of 59 (42%) cases where recurrent laryngeal nerve injury was specifically documented, the plaintiff received an average jury award or settlement of $808,942 (range, $4250-$3,000,000).

Specialties

General surgeons were the most commonly involved (24%), followed by otolaryngologists (20%), anesthesiologists (18%), cardiothoracic surgeons (11%), neurosurgeons (7%), vascular surgeons (6%), orthopedic surgeons (2%), plastic surgeons (2%), and gastroenterologists (2%). A radiologist, a general practitioner, an emergency medicine physician, an endocrinologist, and a chiropractor were each named in 1 case. The defendant’s medical specialty was unknown in 9 cases (7%). For the top 3 represented specialties, the rate of settlements plus plaintiff verdicts was 52% (15 of 29 cases) for general surgeons, 21% (5 of 24 cases) for otolaryngologists, and 18% (4 of 22 cases) for anesthesiologists. Settlements and verdicts by specialty are presented in Figure 2.

Procedures

The most common procedure causing alleged injury was thyroidectomy (37%), followed by intubation (18%), cervical spinal instrumentation (10%), laryngoscopy with instrumentation (7%; ie, polypectomy, vocal fold augmentation), endarterectomy (7%), thoracic procedure (6%; ie, coronary artery bypass graft, aortic aneurysm repair, thoracoscopy, thymectomy), parathyroidectomy (3%), and diverticulotomy (2%). Each of the following procedures was listed in 1 case: thyroplasty, chondrolaryngoplasty, tonsillectomy, uvulopalatopharyngoplasty, open neck biopsy, esophagegastro-duodenoscopy, radiofrequency ablation of the esophagus, radiofrequency neurolysis, discogram, and cervical spinal adjustment. In 8 cases, the procedure was unlisted (7%). For the top 3 most common procedures, the rate of settlements plus plaintiff verdicts was 45% (19 of 42 cases) for thyroidectomy, 5% (1 of 22 cases) for intubation, and 25% (3 of
Claims

The most common claim was need for additional surgery (33%; eg, subsequent laryngoscopy, phonomicrosurgery, framework repair for paralysis [such as thyroplasty], and surgery to repair esophageal trauma), followed by inadequate informed consent (33%), lost wages (19%), loss of consortium claimed by the plaintiff’s partner (13%), unnecessary surgery (13%), need for tracheostomy (9%), and delayed diagnosis (3%). For the top 3 most common claims, the rate of settlements plus plaintiff verdicts was 24% (10 of 41 cases) for need for additional surgery, 28% (11 of 40 cases) for inadequate informed consent, and 48% (11 of 23 cases) for lost wages. Settlements and verdicts by claim are presented in Figure 4.

Factors Associated with Indemnity

Of all variables—including specialties, procedures, claims, and symptoms—2 were found to be associated with a settlement or plaintiff verdict, according to binary logistic regression: general surgery specialty (OR, 6.3; 95% CI, 1.7-23.2) and loss of consortium (OR, 8.5; 95% CI, 1.2-60.7).

Discussion

The medical malpractice system is intended to discourage negligent care. Classical tort deterrence theory assumes that the threat of litigation will make health care providers more vigilant in practicing medicine according to the standard of care, thereby improving patient outcomes. There is, however, a body of evidence showing an association between risk of litigation and defensive medicine in the form of avoidance tactics (ie, steering clear of risky patients and procedures) and assurance tactics (ie, ordering additional medications, tests, and consultations). In a study of 824 physicians by Studdert et al, 92% reported practicing defensive medicine in the form of unnecessarily ordering tests, performing diagnostic procedures, and referring patients for consultation, and 42% reported that they had...
taken steps to restrict their practice in the previous 3 years, including eliminating procedures prone to complications or avoiding patients with complex medical problems. Consequently, not only has the malpractice system increased the cost of health care, but it has led to worse patient outcomes due to restricted access and overuse of services.

Our litigation system is by nature an accusatory process that can have lasting effects on a physician’s well-being.
The course of litigation is generally protracted, with an average time to close a malpractice claim of 19 months, but it can last for years in cases going to court. This litigation period is particularly stressful for the physician, leading to decreased overall physical and mental quality of life and decreased career satisfaction. Balch et al surveyed >7000 surgeons and found that those who had recently experienced a malpractice suit had higher rates of burnout, depression, and suicidal ideation. Physician burnout can subsequently lead to poor judgment in patient care, to less compassion and more hostility toward patients, and to diminished commitment to quality of care.

To prove negligence in court proceedings, duty, breach of duty (deviation from standard of care), harm, and causation must all be established. Such rigorous standards contribute to the high rate of defense verdicts (70%) found in this and other studies related to malpractice resulting in recurrent laryngeal nerve injury. However, the awards were significant in lost cases, averaging $788,713, with modestly reduced awards for settlements as compared to plaintiff jury awards ($565,283 vs $885,244).

Understanding dysphonia from a medicolegal perspective is of interest not only to the otolaryngologist but to other specialists as well. In this study, general surgeons (24%) and otolaryngologists (20%) constituted the majority of defendants. Both specialties perform thyroid surgery, which is the most common procedure leading to litigation (34%). In both thyroid and parathyroid surgery, the voice can be affected if either the recurrent laryngeal nerve or the superior laryngeal nerve is devascularized, stretched, traumatized, or severed. For this reason, intraoperative neuromonitoring (IONM) of the recurrent laryngeal nerve was developed. However, there is literature to support both its efficacy in preventing laryngeal nerve injury and its lack of efficacy.

One large meta-analysis showed no reduction in rates of vocal cord palsy with the use of IONM, and IONM has not been found to protect against litigation. An international group has proposed the following guidelines for optimal use of recurrent laryngeal nerve monitoring in thyroid and parathyroid surgery: preoperative laryngoscopy in all cases, presurgical vagal stimulation, postsurgical vagal stimulation, and postoperative laryngoscopy. However, IONM is not considered a substitute for accurate anatomic identification of the recurrent laryngeal nerve intraoperatively.

Anesthesiologists were frequently named as defendants in cases of iatrogenic dysphonia due to intubation trauma (18%). This high rate of involvement is likely related to the high rate of exposure to risk of nerve damage, in that every case requiring intubation presents a risk. In these cases, they were blamed for direct injury to the vocal fold, for arytenoid subluxation or dislocation, or for use of unnecessarily large endotracheal tubes resulting in compression injury to the recurrent laryngeal nerve. There had been no data on how the use of the GlideScope or other video laryngoscopy devices during intubation affects outcomes of subsequent litigation.

Cervical spinal instrumentation was the third-most common procedure involved in litigation (10%); it is a procedure in which neurosurgeons, orthopedic surgeons, and otolaryngologists may all be involved. Vocal disturbance can result from higher vagal injuries as well as injury to the recurrent laryngeal nerve. Jung et al studied patients who underwent laryngoscopy before and after anterior cervical spine surgery and found that 2% had recurrent laryngeal nerve palsy without hoarseness preoperatively and that 11% had nerve palsy persistent 3 months after surgery, with a quarter of these patients complaining of hoarseness. Other studies have listed exposing high or multiple cervical levels and revision surgery as risk factors for postoperative voice and swallowing complaints. Interestingly, although upper endoscopies are not commonly associated with dysphonia, gastroenterologists were named in 2 cases. Although the rulings were both in favor of the defendant, it appears that dysphonia was not in the discussion as a risk of the procedure, possibly because hoarseness was assumed to be a symptom of reflux disease.

Voice disturbance can result in reduced social interaction, decreased self-perception, increased anxiety, and worsened depression. Studies show an association between dysphonia and decreased general health status, with accompanying reductions in physical, mental, and social quality of life comparable to patients with heart failure, angina, sciatrica, or chronic obstructive pulmonary disease. Dysphonia can also adversely affect employment, leading to lost wages. The voice is used “professionally” not only by singers but also by teachers, those in management positions, those on the phone for a significant portion of the day, and those who rely on direct communication with others for their livelihood, such as physicians. In a recent study by Cohen et al, patients with unilateral vocal fold immobility reported that dysphonia adversely affected current job performance, future career, and job options, with loss of productivity comparable to or worse than that of patients with asthma, acute coronary syndrome, and depression. Thus, the value of the voice makes it a prime target for litigation.

Our study had a preponderance of women, likely due to the higher incidence of thyroid disease in women (as thyroidectomy cases composed the largest group). One may hypothesize that women find dysphonia more debilitating than men, but studies have demonstrated that there is no difference in overall health-related quality of life between dysphonic men and dysphonic women.

Symptoms related to vocal fold dysfunction include swallowing and breathing. Glottic incompetence resulting from vocal fold paresis or paralysis reduces one’s ability to develop subglottic pressure for effective swallowing. Dysphagia was claimed by 19% of plaintiffs in our study. This is in contrast to the 69% of patients interviewed by Francis et al who reported new-onset coughing and choking with swallowing, globus sensation, and feelings of self-consciousness and anxiety in public or social situations associated with unilateral vocal fold immobility. In his study, 74% of patients also reported new-onset breathing symptoms characterized by shortness of breath, inability to clear pharyngeal secretions, and reduced physical activity. Poor control of subglottic pressure leads not only to an...
ineffective cough but also to dysfunctional Valsalva maneuver and inability to bear down to physically exert oneself. In our study, 30 plaintiffs (29%) endorsed dyspnea, with 11 (9%) requiring tracheostomy.

To the health care professional, the risk for voice dysfunction is inherent in a number of procedures. However, in a third of the examined cases, plaintiffs felt as though they were inadequately informed of this risk, claiming that they would not have undergone the procedure had this risk been thoroughly explained. In obtaining an informed consent, physicians are required to disclose any information that a reasonable patient would likely attach significance to in deciding whether to undergo a procedure. Therefore, since dysphonia, dysphagia, and dyspnea have the potential to significantly alter the quality of a patient’s life, it is imperative that physicians do not marginalize these risks during the consent process. A physician should list all potential risks in lay terms, encouraging and answering all questions and gauging the patient’s understanding to one’s best ability.

Due to a small number of cases reviewed, as compared with a large number of variables tested, we were able to identify only 2 variables of significance that may increase the risk of a plaintiff verdict or settlement: general surgeon specialty (OR, 6.3; 95% CI, 1.7-23.2) and, interestingly, loss of consortium (OR, 8.5; 95% CI, 1.2-60.7). One may speculate that the first factor is due to the relative infrequency in which general surgeons perform thyroid-related surgeries when compared with otolaryngologists, who operate in the neck much more frequently. However, there was no information about whether the general surgeons involved in the cases were fellowship trained in endocrine surgery, as this information would provide more insight into whether the lack of specialty training influences the risk of litigation. One can imagine how pain, discomfort, stress, change in mood, and loss of function related to the vocal cords can impair a patient’s love life. Therefore, if it is important to discuss all potential complications to which a patient would attach personal significance, then perhaps physicians should broaden the consent process to include this risk, especially in our current culture wherein sexuality is increasingly embraced as an important part of physical and emotional well-being.

Although the Westlaw Database is a comprehensive legal database that allows searches of both federal and state court records, it is limited by mandatory reporting guidelines that vary immensely by jurisdiction. Therefore, the data collected have inherent heterogeneity. Also, there is a lack of specific information, such as the use of pre- and postoperative laryngoscopy and how they were performed. Furthermore, out-of-court settlements are likely underrepresented, as the majority are settled before the point at which they are published in state and federal court records. It is estimated that only 15% of malpractice claims proceed to trial. Therefore, the claims represented by the Westlaw Database characterize a minority of all claims. Other sources, such as the Physician Insurers Association of America Database, represent about a quarter of all claims but have significantly less case-specific detail.

**Conclusion**

Dysphonia and injury to the recurrent laryngeal nerve are well-known risks of procedures performed by a variety of specialties. Due to the impact of vocal dysfunction on a patient’s quality of life, physicians involved in such procedures are at risk for litigation. Although defendant verdicts were more common in our study (70%), awards for settlements and plaintiff verdicts were considerable ($788,713 on average). General surgery specialty (OR, 6.3) and loss of consortium (OR, 8.5) were associated with settlements or plaintiff verdicts. Awareness of the factors involved in lawsuits over dysphonia may allow physicians to decrease their risk of prosecution.

**Author Contributions**

Jennifer H. Ta, conception, design, data collection, manuscript writing, manuscript submission; Yuan F. Liu, design, data analysis, manuscript writing, manuscript editing, manuscript submission; Priya Krishna, design, data analysis, manuscript editing.

**Disclosures**

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