

Introduction

Carotid artery disease is a common illness which can pose a significant risk if left untreated. Treatment via carotid endarterectomy (CEA) or carotid artery stenting (CAS) can also lead to complications. Given the risk of adverse events related to treating, or failing to treat carotid artery disease, this is a possible area for litigation. The aim of this review is to provide a broad overview of the medico-legal factors involved in treating patients suffering carotid artery disease and to directly compare litigation related to both CEA and CAS.

Methods

Three large legal databases were used to search for jury verdicts and settlements in cases related to untreated carotid artery disease, CEA and CAS. Search terms included “endarterectomy,” “medical malpractice,” “carotid,” “stenosis,” “stenting”, “stent” and combinations of those words. Three types of cases were considered relevant: (1) Cases in which the primary allegation was negligence in relation to performing a CEA and/or peri-operative care (CEA-related cases);(2) Cases in which the primary allegation was negligence in relation to performing a CAS and/or perioperative care (CAS-related cases); (3) Cases where the plaintiff alleged that a CEA or CAS should have been performed (failure-to-treat (FTT) cases).

Results

154 CEA-related cases, 3 CAS-related cases and 67 FTT cases were identified. Doctor(s) were named as defendants in 75% of cases. Stroke was the most common injury (63%) followed by nerve injury in CEA (21%). Cases resulted in 133 verdicts for the defense (59%), 64 settlements (29%) and 27 plaintiff verdicts (12%). The average payout in cases which settled outside of court was \$1,097,430 and the average payout in cases which went to trial and resulted in a plaintiff verdict was \$2,438,253. Common allegations included; a failure to timely diagnose and treat carotid artery disease, treating with inappropriate indications, procedural error, negligent post-procedural management and lack of informed consent. Allegations of procedural error, specifically where the resultant injury was nerve injury, were unlikely to lead to a payout (28% of cases involved a payout). Allegations of a failure to timely treat known carotid artery disease were relatively more likely to lead to a payout (60% of cases involved a payout).

Table 1 - Injury Type

| Case Type             | FTT cases (n=67) | CEA cases (n=154) | CAS cases (n=3) |
|-----------------------|------------------|-------------------|-----------------|
| Stroke                | 65 (97%)         | 55 (36%)          | 2 (67%)         |
| Nerve Injury          | 0                | 39 (25%)          | 1* (33%)        |
| Airway Compromise     | 0                | 14 (9%)           | 0               |
| Retained foreign body | 0                | 2 (1%)            | 0               |
| Cardiac Arrest/MI     | 0                | 3 (2%)            | 0               |
| Vocal Cord Damage     | 0                | 7 (5%)            | 0               |
| Horner's Syndrome     | 0                | 1 (0.6%)          | 0               |
| Unspecified           | 2 (3%)           | 28 (18%)          | 0               |

Table 2 - Reason for Litigation

| Reason for litigation                                                                    | Number of cases | Settlement | Verdict  |           |
|------------------------------------------------------------------------------------------|-----------------|------------|----------|-----------|
|                                                                                          |                 |            | Defence  | Plaintiff |
| Failure to timely/accurately diagnose carotid artery disease                             | 60 (27%)        | 19 (32%)   | 33 (55%) | 8 (13%)   |
| Failure to timely order imaging                                                          | 35 (59%)        | 15 (43%)   | 15 (43%) | 5 (14%)   |
| Failure to correctly interpret imaging                                                   | 14 (23%)        | 4 (29%)    | 8 (57%)  | 2 (14%)   |
| Failure to diagnose. Case details with insufficient information/not specified            | 12 (20%)        | 1 (8%)     | 11 (92%) | 0         |
| Failure to timely perform surgery (without failure to timely diagnose)                   | 10 (4%)         | 5 (50%)    | 4 (40%)  | 1 (10%)   |
| Failure to control stenosis with medications (alongside failure to treat surgically)     | 15 (7%)         | 7 (47%)    | 6 (40%)  | 2 (13%)   |
| Unnecessary CEA (CEA perform without appropriate indications and/or preoperative work-up | 24 (11%)        | 9 (38%)    | 14 (58%) | 1 (4%)    |
| Procedural error                                                                         | 24 (11%)        | 9 (38%)    | 14 (58%) | 1 (4%)    |
| Negligent post procedure management                                                      | 41 (18%)        | 14 (34%)   | 18 (44%) | 9 (22%)   |
| Lack of informed consent                                                                 | 15 (7%)         | 3 (20%)    | 10 (66%) | 2 (13%)   |

Table 3 - Distribution of Cases by State

| State         | Number of cases | Percent | Population (millions) | Cases per population |
|---------------|-----------------|---------|-----------------------|----------------------|
| New York      | 29              | 13%     | 19.9                  | 1 per 690,000        |
| California    | 23              | 10.2%   | 39.5                  | 1 per 1.7 million    |
| Pennsylvania  | 20              | 8.9%    | 12.8                  | 1 per 640,000        |
| Florida       | 19              | 8.5%    | 21.0                  | 1 per 1.1 million    |
| Illinois      | 17              | 7.6%    | 12.8                  | 1 per 750,000        |
| Texas         | 16              | 7.1%    | 28.3                  | 1 per 1.8 million    |
| Massachusetts | 14              | 6.3%    | 6.9                   | 1 per 2 million      |
| Missouri      | 10              | 4.5%    | 6.1                   | 1 per 1.6 million    |

Conclusions

Both diagnosing and treating carotid artery disease has serious medico-legal implications and risks. In cases resulting in a settlement or plaintiff verdict, the payouts can be considerably higher than a case resolved outside the courtroom. Knowledge of common allegations in diagnosing and treating carotid artery disease as well as performing CEA and CAS may benefit neurosurgeons. The lack of CAS-related litigation suggests these procedures may entail a smaller risk of litigation compared to CEA, even accounting for the difference in the frequency of both procedures.

Learning Objectives

- 1) Understand factors commonly present in cases of litigation.
- 2) Understand probable outcomes in different cases of litigation.

References

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