

Current practices in vestibular schwannoma management: A survey of American and Canadian neurosurgeons



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ABSTRACT

Objectives: Comprehensive therapy for vestibular schwannomas has changed dramatically over the past fifty years. Previously, neurosurgeons were most likely to treat these tumors via an independent surgical approach. Currently, many neurosurgeons treat vestibular schwannomas employing an interdisciplinary team approach with neuro-otologists and radiation oncologists. This survey aims to determine the current treatment paradigm for vestibular schwannomas among American and Canadian neurosurgeons, with particular attention to the utilization of a team approach to the surgical resection of these lesions.

Methods: A seventeen part survey questionnaire was sent by electronic mail to residency trained members of the American Association of Neurological Surgeons currently practicing in Canada or the United States. Questions were divided into groups regarding physician background, overall practice history, recent practice history, opinions on treatment paradigms, and experience with an interdisciplinary team approach.

Results: Seven hundred and six responses were received. The vast majority of neurosurgeons surgically resect vestibular schwannomas as part of an interdisciplinary team (85.7%). Regional variations were observed in the use of an interdisciplinary team: 52.3% of responding neurosurgeons who surgically treat vestibular schwannomas without neuro-otologists currently practice in the South (no other region represented more than 15.4% of this group, $p = 0.02$). Surgeons who have treated >50 vestibular schwannomas show a trend towards more frequent utilization of an interdisciplinary approach than less experienced surgeons, but this did not reach statistical significance.

Conclusions: The majority of neurosurgeons in the United States and Canada surgically resect vestibular schwannomas via an interdisciplinary approach with the participation of a neuro-otologist. Neurosurgeons in the South appear more likely to surgically treat these tumors alone than neurosurgeons in other regions of the U.S. and Canada.

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1. Introduction

The surgical resection of vestibular schwannomas continues to be one of, if not *the*, most difficult procedures a neurosurgeon can attempt. The initial descriptions of the operative removal of these tumors (the first likely by Thomas Annandale in Edinburgh during 1895[8]) were marred by a “shocking mortality” in the words of Harvey Cushing. Mortality rates of 72–84% were the norm at the time. It was not until the era of Cushing and his rival Walter Dandy that mortality rates were decreased to a more reasonable 10–35%;

this despite the two espousing differing philosophies on tumor removal, Cushing preferring intracapsular debulking while Dandy advocated complete tumor resection via capsular dissection⁵⁸. Later technological advances such as improved surgical lighting, routine use of an operative microscope, and modern microsurgical instruments ushered in a new era of surgical resections [1].

The current context of vestibular schwannoma surgery can be traced to the 1960s when an interdisciplinary team approach was fostered between William House (an otolaryngologist) and Bill Hitselberger (a neurosurgeon) [8]. Prior to this, vestibular schwannomas were considered the domain of neurosurgeons alone. However, House demonstrated success through his middle fossa and translabyrinthine approaches [1]. The latter approach had been described first in 1904 by Panse, but was abandoned due to high cerebrospinal fluid leak rates. Neurosurgical acceptance of

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these procedures was initially hesitant, but through the pioneering partnership between House and Hitselberger this interdisciplinary approach has become commonplace [8]. Advances in imaging diagnosis and intra-operative nerve monitoring have only improved these interdisciplinary surgical relationships and results [5].

While the existing literature often describes the surgical resection of vestibular schwannomas using an interdisciplinary team, surprisingly little has been published regarding how and when this approach is used, and whether it has become “standard of care”. To gain insight into this question, an internet-based survey was created and sent to all American and Canadian residency trained members of the American Academy of Neurological Surgeons (AANS) to assess their current vestibular schwannoma resection practices, in the belief that most of the practicing surgeons treating these tumors would be reached.

2. Methods

A 17-question survey was developed. Attempts were made to target only those neurosurgeons who actively treat vestibular schwannomas via organizations like the Acoustic Neuroma Association (ANA) and North American Skull Base Society, however access to those email membership rosters were unavailable. Therefore, this survey was electronically mailed using an online survey program (www.surveymonkey.com) to members of the AANS. Resident, international (outside of the United States or Canada), or retired inactive members were excluded. Utilizing the Dillman Total Design Survey method [4], after the initial email request was sent, repeat email requests were sent to all non-responders every 2 weeks over an 8-week course. Physicians had the option to opt out of participation in the survey at any point in the process. Demographic information regarding the physician’s geographic region and decade of residency training as well as current practice location was also collected. Standard US Census definitions of American geographic regions were used [11]. If a physician’s training overlapped two separate decades, the decade containing the most training years was assigned as the training decade of record. The complete survey questions can be seen in Appendix 1.

After completion of the survey, all respondents were encrypted into specific respondent identification numbers. Frequency distributions and bivariate Chi-square analysis were used to determine statistical associations via the SAS computer system. An alpha significance level of 0.05 was employed.

3. Results

A total of 4033 emails were initially sent. Eighty-three physicians opted out of the survey while 92 emails were returned from non-functional addresses. Therefore, a total of 3858 possible respondents were available. A total of 706 responses were obtained, giving an overall response rate of 18.3%. Some responders did not answer every question.

3.1. Current practice background

The respondents were almost universally (99.0%) neurosurgeons and most have a long history of treating vestibular schwannomas as 70.1% reported treating these tumors for more than 10 years post-residency (Fig. 1). Of note, a small subset of respondents appear to treat a much larger number of vestibular schwannomas than other physicians as 46 respondents report treating more than 25 vestibular schwannomas per year (Fig. 2). Within the past year, current treatment recommendations appear quite broad as very few respondents universally chose one treatment option for all patients. The most common current geographic

How many acoustic neuromas have you managed in your career?

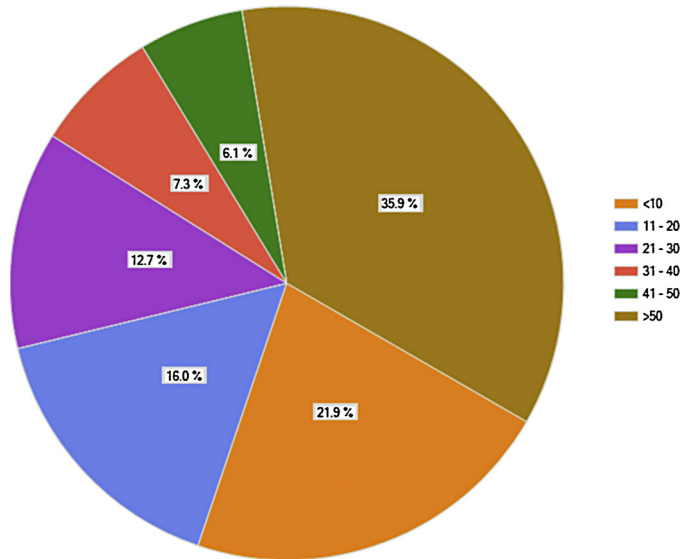


Fig. 1. Number of vestibular schwannoma patients treated.

practice region was the South (35.53% of respondents), followed in order by the Midwest (21.59%), the West (21.15%), Northeast (18.06%), and Canada (3.67%).

3.2. Current opinions

If a surgical resection is undertaken, 54.3% of respondents prefer a retro-sigmoid approach alone while 40.9% of respondents prefer to tailor their approach based on specific tumor characteristics. Most respondents (84.7%) felt that operative competency in vestibular schwannoma resection was obtained within the first 30 surgical resections (Fig. 3). Respondents felt differently regarding the most important outcome measure (hearing preservation, facial strength preservation, or control of tumor size/growth) depending on the chosen treatment modality: control of tumor size was the

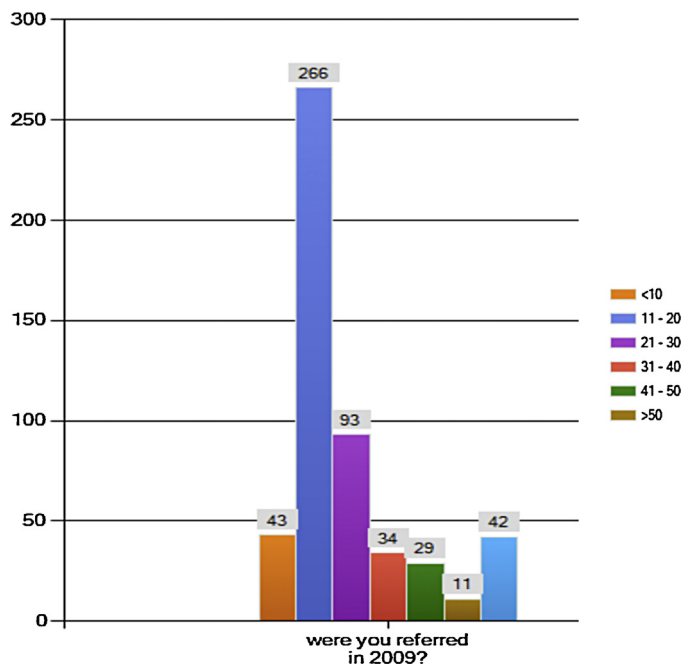


Fig. 2. Number of patients referred in previous calendar year.

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