Editorial

Vestibular schwannomas

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Varughese and colleagues describe their experience with the conservative treatment of patients who have a vestibular schwannoma (VS). The focus of their study was to compare methods of measuring tumor growth over time. They evaluated linear diameter measurements, a volumetric calculation, or the concept of “volume doubling time” (VDT), which they concluded best described the growth rate of untreated tumors. They found that the VDT in their patients was 4.40 years.

The conservative treatment of patients with VSs has appeared to be a more common choice in recent years, although this choice was also common years ago when the only other option was a resection. In an era in which stereotactic radiosurgery has become a common choice for patients with smaller tumors, observation is less often sought, although some groups still continue to advocate a “watch-and-wait” strategy. In the first line of their introduction, Varughese and colleagues state that “a large number of conservatively managed vestibular schwannomas do not grow for many years after diagnosis.” I do not know if this is actually true. What is a large number? Why are some patients chosen for conservative management versus active treatment? What does “many years” mean? It is true that the growth rate of tumors is variable. In our own experience, the majority of patients will show measurable change over time, and it is rare for us to see an unchanged tumor past 5–10 years. Thus, for an elderly patient with a small tumor and minimal symptoms, we typically advocate observation with the specific goal that they get to the end of their life and never have to deal with the tumor. For a younger patient, we think this strategy is unrealistic. Perhaps those patients have a different goal. Perhaps the goal is to avoid management risks or to maintain their hearing at its current level for as long as possible. Unfortunately, it is well known that patients can suddenly lose hearing without imaging-defined growth and that new symptoms can develop over time (for example, tinnitus or disequilibrium). Indeed, the natural history and tendency of a patient with a VS is to lose hearing. In addition, all forms of treatment show better results with smaller-volume tumors. For this reason, an analysis of the growth rate and methods for identifying growth are crucial, and the authors should be applauded for their interest in this area.

In the past few years, there have been a number of studies from different centers that describe the growth rate of VSs. Growth rates such as 1–3 mm/year are common. More specifically, it is claimed that intracanalicular tumors grow at a slower pace than extracanalicular tumors. The purpose of the article that follows this editorial was how to define that pace. Volumetric measurements are difficult for clinicians to perform because simple software is not commonly available. At the same time, there are so many different kinds of MR imaging platforms and available software tools that clinicians can barely remember how to use them. We can easily determine a linear measurement, but small changes that may seem “clinically unimportant” may actually represent volumetric growth.

Despite their best efforts, there are several weaknesses with the authors’ report. First, they did not conduct annual imaging. This is interesting, given the fact that they were caring for patients with untreated brain tumors. Do they believe that a scan every 2 years is often enough? More typically, closer follow-up would be maintained. From a research perspective, annual images would have provided the authors with more data to identify any changes more accurately.

Second, they did not perform high-resolution, fine-cut imaging. Average axial MR sequences were obtained at 2-mm increments, whereas volumetric scans with 1-mm slices should have been obtained, again because the authors had a research interest in this topic. Such 1-mm volumetric images are used for radiosurgical planning or whenever a detailed analysis is required of a small target. To that end, the authors may have missed small volumetric changes that may have affected clinical decision making.

The authors conclude, based on their findings, that “wait and scan” is a realistic option for patients with small VSs. Although it certainly is an option, it is not one that I would advocate. More and more patients present with useful hearing, and several studies now show that early intervention is associated with better results for hearing preservation compared with observation. The patient should have a good understanding of what they are waiting for. Observation may meet the patient’s individual goals—and that is certainly reasonable. However, clinicians should provide patients with the information that helps them make that best individual decision.

In addition, the authors state that “it is absolutely mandatory to adhere to a follow-up program.” This is also important, and imaging studies should be obtained at more frequent intervals than those in the authors’ study. After diagnosis, another scan should be obtained in 6 months to see if the tumor is a more rapidly growing one and then at least annually thereafter with high-resolution, fine-cut imaging. Their concept of VDT may be a useful one for all of
the tumors that we manage, once a simple means of volume determination is available. As they note, several other reports have documented a shorter VDT (1.65–2.3 years) than in their study.

In conclusion, there have been several recent reports on the growth rate of VSs. Although some variability exists in the results reported from the different centers, we now have much more information available to us than we did 10 years ago. What we do not have is strong information on the consequences of growth or no growth during the relatively short follow-up intervals of these studies. How many patients, because they were observed, had tinnitus, a symptom that often does not improve with treatment? What is the degree of hearing deterioration in comparison with the contralateral non-tumor side? We need more comparison data on intervention versus observation. It is emerging.

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Disclosure

Dr. Kondziolka is a consultant for Elekta.

References


Response

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We appreciate the editorial remarks on our report. The proportion of stable and shrinking tumors within a cohort of patients with VSs was as high as 75% of the cases in one study.6 There even exists a prospective study with a mean follow-up of more than 10 years, which documented stable or shrinking tumors in 60% of the cases.3 This stands in contrast to the study by Régis et al.,7 which showed that as many as 74% of cases required treatment within a mean follow-up of 43.8 months. We agree that the literature on VS does not contain much data about the clinical consequences of growth versus no growth. A recently accepted article from our group focused on the progression of clinical parameters among the same cohort of conservatively treated patients does not indicate that symptoms change dramatically over time, with the exception of progressive hearing loss.

Concerning growth rates, there is increasing evidence for the positive effects of Gamma Knife surgery (GKS) compared with conservative management.2,5 Improved hearing preservation has also been reported.7 However, it is important to recognize that GKS is not a cure-all solution. Even GKS is associated with complications, from the minimal but nonetheless cumbersome, such as transient facial weakness or numbness, to the more serious ones, such as shunt-requiring hydrocephalus and even rare cases of malignancy.4 Is it always necessarily a better solution for a young patient to undergo treatment and risk these complications than it is to obtain follow-up scans that catch the cases that grow?9

Our patients are informed about the advantages and disadvantages of the different treatment modalities that exist and about our current management protocol. The algorithm that we follow was first implemented in 2001, and we follow up conservatively treated patients at 1, 2, and 5 years or more frequently if needed. We found it unnecessary to re-scan the smallest tumors at 6 months, because even in cases of rapid growth, the tumor would still be quite small at 1 year. While there is a risk of hearing loss with conservative management,2 we reasoned that it was still a good option for small- to medium-sized tumors. This was partly because of the high proportion of tumors that do not grow, as described earlier, but also because of a lack of evidence showing that it is beneficial to treat nongrowing tumors.6 More research is certainly needed to elucidate whether hearing and symptoms are beneficially affected by early treatment.

Another methodological issue was also brought up, regarding the use of 2-mm slices. It is not entirely true that a thinner slice would have provided higher sensitivity because the signal-to-noise ratio is reduced the thinner the slice. Compensating for this by, for example, increasing the number of acquisitions also has its practical limitations in terms of the circulation time of the gadolinium contrast fluid. At our center, a tradeoff is made between acquisition time and resolution of the image, not to mention that the contrast fluid provides clearer demarcation of the tumor. It is worth mentioning that ours is one of the very few studies that utilizes tumor volumes to estimate growth, whereas many previous studies have been based on less accurate estimates.

In our opinion, the question of whether GKS rather than conservative management should be recommended for small, nongrowing tumors is not fully answered to this day. More studies comparing conservatively managed tumors with irradiated tumors are needed to find the answers we are looking for.

References

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