Otology

Conservative treatment of vestibular schwannoma: growth and Penn Acoustic Neuroma Quality of Life scale in French language

Trattamento conservativo degli schwannomi vestibolari: accrescimento e Penn Acoustic Quality of Life scale in lingua francese

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SUMMARY

The aim of this study was to determine the natural history of growth and quality of life (QoL) outcomes for vestibular schwannoma (VS) managed conservatively, and to validate the disease-specific Penn Acoustic Neuroma Quality-of-Life (PANQOL) scale in French language. We retrospectively studied 26 patients with VS managed conservatively. Patient characteristics and radiological findings were collected. Two scales were used to measure QoL: the Short Form-36 Health Survey (SF-36) and the PANQOL scale translated into French. Internal consistency and scores were compared with previous studies. The mean follow-up was 25 months (range 6-72). We observed tumour growth in 14 patients (53.8%), no growth in 12 patients (46.2%) and no case of tumour shrinkage. The mean tumour growth was 2.22 mm/year. No predictive factor of growth was found. Patients with vertigo or dizziness experienced a poorer QoL according to the SF-36 (Social Functioning and Emotional Role Limitation dimensions) and to the PANQOL scale (Balance and Energy dimensions). Our results were comparable with the literature using the SF-36. With the PANQOL scale, our scores were not statistically different with those from Dutch and North American studies except in the field of hearing (p = 0.019). Quality of life becomes essential in the management of VS. According to these results, we support a non-conservative strategy associated with vestibular rehabilitation for patients with dizziness or vertigo. The PANQOL is a validated specific scale for VS, which can be useful in French.

KEY WORDS: Vestibular schwannoma • Conservative treatment • Tumour growth • Quality of life • Short Form-36 Health Survey • Penn Acoustic Neuroma Quality-of-Life scale

RIASSUNTO

L'obiettivo di questo lavoro è stato di valutare la storia naturale di crescita degli schwannomi vestibolari (VS), la qualità di vita di quelli trattati in maniera conservativa e di validare una scala specifica per tale malattia in lingua francese, Penn Acoustic Neuroma Quality-of-Life (PANQOL). Sono stati studiati retrospettivamente 26 pazienti con VS trattato in maniera conservativa. Sono state raccolte le caratteristiche dei pazienti e i reperti radiologici, e sono state utilizzate due scale per validare valutare la qualità di vita: la Short Form-36 Health Survey (SF-36) e la PANQOL scale, tradotta in francese. I punteggi ottenuti sono stati comparati con gli studi precedenti. Il tempo medio di follow up è stato di 25 mesi (range 6-72). È stata osservato un accrescimento del tumore in 14 pazienti (53,8%), nessun accrescimento in 12 pazienti (46,2%), e non si è verificata nessuna riduzione. La crescita media del tumore è stata di 2,22 mm/anno, e non sono stati individuati fattori predittivi di crescita. I pazienti con vertigini e instabilità hanno riferito una più bassa qualità di vita, sia secondo la scala SF-36, sia secondo la scala PANQOL. Utilizzando la scala SF-36, i nostri risultati si sono rivelati paragonabili a quelli della letteratura. Utilizzando la scala PANQOL, i nostri punteggi non si sono rivelati statisticamente diversi da quelli derivanti da studi tedeschi e nordamericani, ad eccezione di quelli riguardanti l'udito (p=0,019). La qualità di vita diventa sempre più importante nella gestione dei VS. In linea con questi risultati, noi sosteniamo la strategia non conservativa associata ad una riabilitazione vestibolare per quei pazienti con vertigini ed instabilità. La scala PANQOL, disponibile in lingua francese, si è rivelata specifica per i VS.

PAROLE CHIAVE: *Schwannoma vestibolare • Trattamento conservativo • Accrescimento tumorale • Qualità di vita • Short Form-36 Health Survey •Penn Acoustic Neuroma Quality-of-Life scale*

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Introduction

Vestibular schwannomas (VS) are benign tumours that represent 6% of intracranial tumours and 85% of cerebellopontine angle (CPA) tumours [1]. Most grow slowly, but some do not and some regress [1 2]. Nowadays, there is the ability to diagnose very small VS increases thanks to the availability of magnetic resonance imaging (MRI).

The management strategy of VS is still controversial. Management options include microsurgery, stereotactic radiosurgery, a combination of both and observation by serial imaging. Invasive treatments by microsurgery or radiosurgery are associated with consequences for quality of life (QoL) [3]. Radiosurgery seems to provide better functional outcomes with less morbidity than microsurgery, but side effects are still present [3 4]. Since 1985, conservative management with serial observations by MRI has become more interesting, especially for small tumours and elderly patients [5]. Therapeutic strategy is often correlated to the tumour size, the tumour capacity to grow, patient age and hearing status. Several studies have focused on predictive factors of growth with no strong significance in meta-analysis except for tumour size at diagnosis [1 6].

At present, QoL has become more predominant in VS management, but the literature is still heterogeneous [7]. Most studies use the Short Form-36 Health Survey (SF-36), a non-specific questionnaire, to measure QoL and few are prospective, randomised trials. Recently, Shaffer et al. have developed the Penn Acoustic Neuroma Quality-of-Life scale (PANQOL) as a specific QoL scale for VS [8]. Validated in the Dutch language by Van Leeuwen et al., it seems to be more correlated with symptoms influencing QoL [9]. To our knowledge, no study has validated the PANQOL scale in French.

Based on our experience and a review of the literature, this study focused on the natural history of growth and QoL outcomes for VS managed conservatively. The first aim of this work was to validate the PANQOL scale translated into French language and comparing it with data of previous studies. The second endpoint was to determine predictive factors of tumour growth of VS managed conservatively and make correlations between tumour growth and QoL using the SF-36 and PANQOL scales.

Materials and methods

Patients

This work reports on a retrospective study of consecutive cases of VS treated conservatively in a university tertiary referral centre over 10 years (August 2002-September 2012). Patients with a sporadic unilateral VS first managed by a "wait-and-scan" strategy with repeated MRI (at least two MRI six months apart) were included. Cases with other CPA tumours as well as cases with neurofibromatosis type II were excluded. Patients who are unable to answer a written questionnaire in French language were also excluded. The medical ethics committee of our University Medical Centre approved our protocol before the beginning of the study.

Workup

Epidemiological data and clinical assessment were recorded from patients' clinical charts. Audiometric data were analysed as recommended by the Committee on Hearing and Equilibrium guidelines [10]. Class A was defined as normal hearing, Class B as moderate hearing loss and Classes C and D as severe hearing loss. Facial function was defined by the House Brackmann grading.[(11)] Tumours were classified as intracanalicular, extracanalicular grade 1 (≤ 10 mm), grade 2 (11-20 mm), grade 3 (21-30 mm), grade 4 (31-40 mm) and grade 5 (≥ 41 mm) according to the 2003 consensus meeting in Tokyo [12]. Tumour size was measured by MRI using the longest extracanalicular size and the antero-posterior size. Comparisons of these two measures on repeated MRI were performed to determine tumour growth (mm/year).

Patients were contacted by phone to take part in the study. They then received a package with two questionnaires (SF-36 and PANQOL scale) and an agreement form they were asked to send back by postage-paid envelope.

Questionnaires

The *Short Form-36 Health Survey (SF-36)* is a valid, generalist QoL scale. It consists of 36 multiple-choice questions that assess 8 dimensions: Physical Functioning (PF), Social functioning (SF), Physical Role Limitations (PR), Emotional Role Limitations (ER), Mental Health (MH), Vitality (VT), Bodily Pain (BP), and General Health (GH). Physical component score is calculated from PF, PR, BP and GH dimensions. The mental component score is provided by the SF, ER, MH and VT dimensions. The SF-36 scale ranges from 0 to 100, and a higher score indicates a status of better health. The SF-36 has already been validated in French [13 14].

The *Penn Acoustic Neuroma Quality of Life (PANQOL) scale* is a specific questionnaire consisting of 26 questions that assess 7 dimensions: Hearing, Balance, Face, Anxiety, Energy, Pain, General Health. The PANQOL scale ranges from 0 to 100, and a higher score indicates better health status. The PANQOL questionnaire was translated into French according to the accepted rules of forward-backward translation as presented in Appendix 1 [15]. No divergence between the original and translated items was found.

Statistical analysis

Statistical analysis was performed using SPSS software (version 20. for Windows). Means, medians and standard deviations of demographic and clinical data were calcu-

lated and analysed using the student's T-test. The Pearson correlation coefficient was used to analyse predictive factors of tumour growth and relationships between tumour growth and QoL scores (SF-36 and PANQOL). Results were considered significant when the p value was < 0.05. Internal consistency of the French PANQOL scale dimensions was measured using Cronbach's alpha, which is an exploratory factor analysis used to describe the reliability of questionnaire items. The value of alpha is an indication of the extent to which a number of items in a test measure the same concept. A commonly accepted interpretation of Cronbach's alpha (between 0 and 1) is excellent (≥ 0.9), good (0.8-0.9), acceptable (0.7-0.8), questionable (0.6-0.7), poor (0.5-0.6), or unacceptable (≤ 0.5). The SF-36 scores and the PANQOL scores in our sample were compared with the PANQOL scores of Van Leeuwen et al. and Shaffer et al. studies using the student's T-test [8 9].

Results

Population and tumour growth

Over 10 years (August 2002-September 2012), 327 patients were diagnosed with VS. Twenty-six patients (8%) initially managed by conservative strategy were included in our study. Nine patients were males (34.6%) and 17 were females (65.4%), i.e. a sex ratio of 0.5. The mean age at diagnosis was 55.73 years (range 40-81 years). Half of the patients had useful hearing (class A or B) at diagnosis and 6 (23%) had severe hearing loss (class C or D). Hearing levels were not reported in 7 patients (27%). Tinnitus was presented at diagnosis in 9 patients (34.6%) and dizziness or vertigo in 2 patients. No facial palsy was presented.

Main tumours were small to medium size. There were 13 intracanalicular VS, 3 tumours of grade 1, 9 tumours of grade 2 and 1 tumour of grade 3. The mean and median tumour size at diagnosis were 11.65 mm and 11 mm, respectively.

Mean and median follow-up were 25.8 and 20.5 months respectively (range 6-40). Tumour growth was observed in 14 patients (53.8%), no growth in 12 patients (46.2%) and none cases presented shrinkage. Mean tumour growth was 2.22 mm/year (range 1-5 mm/year). All patients ended their conservative treatment by microsurgical procedure for following reasons: tumour growth, hearing loss, vertigo, or dizziness.

Predictive factors of tumour growth

Prognostic impact of patient characteristics (epidemiological data, clinical assessment, tumour size at diagnosis) on tumour growth were analysed. No significant predictive factor of tumour growth was revealed (Table I).

Quality of life

Twenty patients completed and returned the questionnaires (76.9%). Patient characteristics of non-responders were not significantly different from responding patients. The SF-36 scores are reported in Table II. These results were consistent with previous studies [9 16 17]. The SF-36 showed a poorer QoL in mental component score than in physical component score, 44.8% and 51.6%, respectively. We reported a significant decrease in Social Functioning ($p = 0.042$) and Emotional Role Limitations ($p = 0.033$)

Table I. Analyses of the prognostic impact of patient characteristics (epidemiological data, clinical assessment, tumour size at diagnosis) on tumour growth.

Patient characteristics	Patients (N = 26)	Prognostic impact on tumour growth (longest extracanalicular size) p	Prognostic impact on tumour growth (antero-posterior size) p
Mean age at diagnosis (year) (range)	55.73 (40-81)	0.247	0.453
Gender M/F	9/17	0.240	0.412
Mean follow-up (month) (range)	25.81 (6-72)	0.248	0.537
Tumour size at diagnosis, No. of patients (%)		0.797	0.423
Intracanalicular	13 (50)		
Grade 1	3 (11.5)		
Grade 2	9 (34.6)		
Grade 3	1 (3.9)		
Hearing levels at diagnosis, No. of patients (%)		0.233	0.391
Class A (normal hearing)	8 (30.8)		
Class B (moderate hearing loss)	5 (19.2)		
Class C or D (severe hearing loss)	6 (23)		
Not reported	7 (27)		
Vertigo or dizziness, No. of patients (%)	2 (7.7)	NA	NA
Tinnitus, No. of patients (%)	9 (34.6)	0.214	0.949
Facial palsy, No. of patients (%)	0 (0)	NA	NA

(NA: not applicable)

Table II. SF-36 scores and correlation coefficient with tumour growth.

Patients (N = 20)	Mean (SD)	Correlation coefficient with tumour growth	
		Longest extracanalicular size (p)	Antero-posterior size (p)
Physical Functioning (PF)	84.1 (22.7)	-0.379 (0.281)	-0.159 (0.622)
Social functioning (SF)	70.0 (34.2)	-0.227 (0.529)	-0.514 (0.087)
Physical Role Limitations (PR)	71.8 (38.5)	-0.627 (0.096)	-0.511 (0.131)
Emotional Role Limitations (ER)	75.0 (41.2)	-0.48 (0.228)	-0.583 (0.077)
Mental Health (MH)	64.3 (26.1)	-0.326 (0.357)	-0.46 (0.132)
Vitality (VT)	58.0 (22.8)	-0.405 (0.246)	-0.441 (0.151)
Bodily Pain (BP)	86.1 (26.6)	-0.435 (0.208)	-0.244 (0.455)
General Health (GH)	67.4 (12.4)	-0.153 (0.673)	-0.115 (0.722)
Physical component score	51.6 (10.4)	-0.274 (0.512)	-0.021 (0.954)
Mental component score	44.8 (14.3)	-0,378 (0.355)	-0.634 (0.049)

(SD: Standard Deviation; in bold: $p < 0.05$)

dimensions in patients presenting dizziness or vertigo. The mental component score was significantly lower in patients with hearing loss ($p = 0.040$). No significant relationship was found between QoL and tinnitus or facial palsy. Furthermore, a significant negative correlation was found between tumour growth measured on the antero-posterior size and mental component score ($p = 0.049$) using the SF-36. Although its subscales showed a negative correlation, none were statistically significant.

We kept the initial 7-dimensions structure of the PANQOL as published by Shaffer et al. after exploratory factor analysis [8]. Means, standard deviations and Cronbach's alphas of our PANQOL scale are compared on Table III with the American and Dutch scores [8 9]. Our results were consistent with these previous studies, as shown in Figure 1, except for Hearing dimension ($p = 0.019$) of Van Leeuwen et al. [9]. The lowest scores were found in Hearing dimension (57.23), Balance dimension (62.7) and General Health (59.72). Patients presenting vertigo or dizziness experienced a poorer QoL in Balance dimension ($p = 0.015$) and Energy dimension ($p = 0.047$). There was no significant relationship between tumour growth and QoL evaluated by the PANQOL.

Discussion

In the management strategy of VS, conservative management with repeated MRI and monitoring of tumour growth has become of increasing interest for small tumours and elderly patients. We aimed to determine the predictive factors of tumour growth and to analyse QoL using the SF-36 scale, a generalist QoL scale, and the PANQOL scale translated into French language, a specific scale for patients with VS. We retrospectively studied 26 cases of VS that were initially managed by conservative strategy. Twenty patients were evaluated by QoL scales. No significant predictive factor of tumour growth was revealed in our study. To the best of our knowledge, our study is the first using PANQOL scale in French language. Our results are comparable to the North American and Dutch version studies. The major finding of this work is that patients presenting vertigo or dizziness experienced a significantly poorer QoL.

Tumour growth analysis is consistent with the literature

Our study followed tumour growth for more than half of patients (53.8%) of an average of 2.22 mm/year. These results are consistent with the literature [16 17]. Nikolopoulos

Table III. Means, standard deviations and internal consistency (Cronbach's alpha) of PANQOL scale in current and previous studies.

PANQOL dimensions	Our study (N = 20)		Van Leeuwen et al. (N = 119)		Shaffer et al. (N = 143)	
	Mean (SD)	Alpha	Mean (SD)	Alpha	Mean (SD)	Alpha
Hearing	57.2 (25.3)	0.68	41.3 (27.3)	0.75	63.8 (22.2)	0.77
Balance	62.8 (28.2)	0.90	66.0 (29.4)	0.94	72.9 (20.5)	0.87
Face	84.2 (15.4)	0.46	83.6 (21.3)	0.65	85.4 (18.9)	0.71
Anxiety	72.4 (23.2)	0.72	71.3 (25.2)	0.88	73.5 (20.4)	0.81
Energy	69.3 (25.7)	0.89	66.2 (28.9)	0.91	67.6 (23.0)	0.88
Pain	78.9 (32.6)	NA	70.4 (35.9)	NA	77.7 (28.7)	NA
General Health	59.7 (19.9)	0.25	60.4 (22.1)	0.31	68.3 (21.3)	0.73

Means, standard deviations and internal consistency (Cronbach's alpha) of PANQOL scale in current and previous studies
(SD: Standard deviation; NA indicates not applicable because only one item is included in this dimension; in bold: $p < 0.05$)

et al. found in a meta-analysis that tumour growth was between 18 and 73% of an average of 2 to 4 mm/year and the absence of growth between 9 and 75% of cases depending on the study [1]. We did not find any case of tumour regression, although it is found in usually less than 10% of cases [1 24].

Although some authors relate mainly tumour growth in the first year after diagnosis, other tumours may begin to grow later [18 21 22]. Moreover, the absence of tumour growth after 5 years of follow-up has already been described, but even longer tumour growth as well [2 18 21]. Thus, among the various monitoring protocols proposed in the literature, those advising close monitoring during the first 5 years and then ongoing monitoring beyond seems to be the most suitable for monitoring patients with VS [2 18 23].

No significant predictive factor of tumour growth was revealed

Several studies failed to find a predictive factor, but Smouha et al. in a meta-analysis observed a significant relationship between tumour growth in the first year and future growth [1 6 18 20]. However, this result was not confirmed by a recent meta-analysis, emphasising the need to follow VS in the longer term [1]. Artz et al. reported unsteadiness/vertigo, no sudden onset of hearing loss and short duration of hearing loss as predictive factors of tumour growth and proposed a tumour growth risk (High Risk/Low Risk) according to these factors [19]. High Risk VS had a greater probability to grow than Low Risk VS during the first (36.9% vs. 2.5%) and second (64.6% vs. 12.7%) years. The absence of a significant predictive factor is probably related to the heterogeneity of methods and results in the literature as well as to some biases present in our study.

The SF-36 is most widely used in QoL studies on VS but it is a generalist scale

QoL has become decisive in the management of VS in the last decade. However, we note the difficulty to compare studies because of the different scales used to measure QoL [7]. Moreover, theses scales are unspecific to symptoms experienced by patients who suffer from VS.

We used the SF-36 as a generalist scale because it is most widely used in studies on VS. We found a greater deterioration of the mental component score than the physical component score in contrast to Lloyd et al. [25]. Our study suffers from a selection bias because we sent our questionnaires retrospectively to operated patients who follow a conservative strategy first. QoL seems to be worse in patients who complain with dizziness, especially in the social dimension. Previous studies already reported a similar result [7 25 26]. Thus, our results support ì that non-conservative management and vestibular rehabilitation should be proposed to dizzy patients.

The effect of hearing loss on QoL is still controversial [7]. Several studies have underlined the importance of hearing loss with QoL, although Godefroy et al. reported no association between hearing loss and SF-36 scores [17 27].On the contrary, we observed a significant relationship between hearing loss and the mental component score, but none of these subscales were significantly related to hearing loss. The reason is probably the low statistical power of our results.

A slightly significant negative correlation was found between tumour growth measured on the antero-posterior size and mental component score, but it was not significantly related in its subscales. Furthermore, we did not find such a correlation using the longest extracanalicular size or with the PANQOL scale. According to Godefroy et al., QoL measured with the SF-36 was not decreased by tumour growth [17]. However, this result underlines the need for psychological support in patients with VS managed conservatively.

Finally, according to Vogel et al., the perceived QoL of VS patients was significantly lower than the QoL of patients with head and neck cancer, benign prostate hypertrophy, or chronic obstructive pulmonary disease [16]. Poor illness perception can be explained by the lack of social support, underlying the need to measure the QoL of patients with VS following a conservative strategy and to provide psychological support.

The PANQOL scale is a specific QoL scale and requires a French version

Created by Shaffer et al., the PANQOL scale is a more specific QoL scale on symptoms experienced by VS patients [8]. Recently validated in Dutch language by Van Leeuwen et al., we used a French translated version in our study [9]. We decided to keep the initial 7-dimensions design proposed by Shaffer et al. and we obtained an acceptable reliability for four dimensions: Anxiety ($\alpha = 0.72$), Balance ($\alpha = 0.90$), Energy ($\alpha = 0.89$) and Hearing ($\alpha = 0.68$) [8]. Face dimension was unacceptable ($\alpha = 0.46$) probably because of a different interpretation of "face expression" in French language (question 10). The poor reliability obtained for General Health dimension ($\alpha = 0.25$) can be explained by the fact that there are only 2 questions that compose it. The pain dimension consists of only one question and internal consistency measured using Cronbach's alpha was not applicable; that is also a drawback of the PANQOL.

Despite the differences in internal consistency, our results are comparable to the North American and Dutch scores as shown in Figure 1. Van Leeuwen et al. obtained a significant difference in the Hearing dimension probably because they changed the initial 7-dimensions structure, as noted by them [9].

We again found a significant relationship between dizziness and a worse QoL in two dimensions of the PANQOL scale. The consequences of dizziness on QoL have already been explored by Shaffer et al. and Van Leeuwen et al. using the PANQOL scale [28 29]. Thus, conservative management of VS would not be appropriate for dizzy patients.

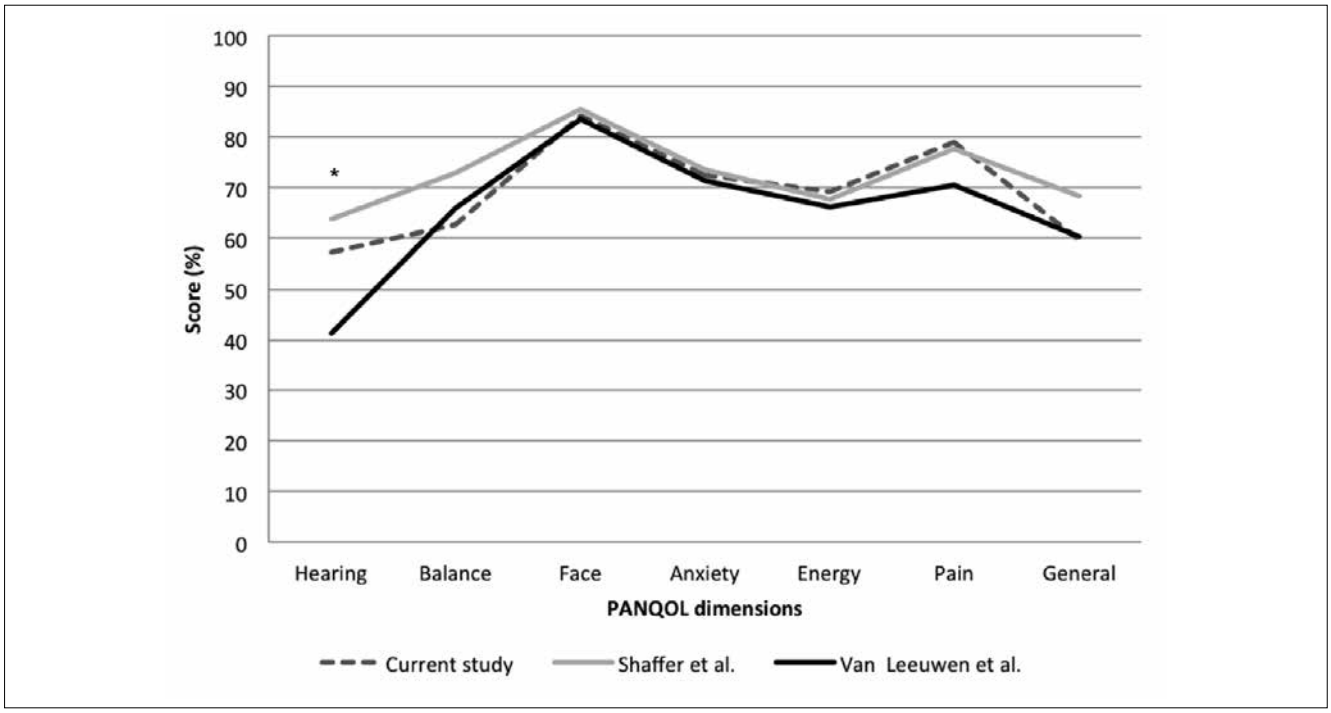

Fig. 1. Comparison of PANQOL scores in current and previous studies.

Some recent studies have reported no difference in QoL between invasive and conservative treatments after long-term follow-up. According to Robinett et al., there was no difference in QoL scores between microsurgery, stereotactic radiosurgery and observation by serial imaging after 5 years of follow-up, whereas radiosurgery was associated with significantly better QoL from 0 to 5 years [30]. The multicentric study of Carlson et al. found very small differences in long-term QoL between management groups using non-specific (SF-36, Glasgow Benefit Inventory) and specific (PANQOL) scales [31]. A better total PANQOL score and higher PANQOL subdomain scores (facial, balance and pain) were observed in patients with stereotactic radiosurgery or observation management in comparison with microsurgery. QoL might be deteriorated by a diagnosis of VS rather than its treatment. These results underlined the benefit of conservative treatment on VS. Invasive treatments should be reserved for fast-growing or symptomatic tumours.

Limitations and perspectives

We conducted a retrospective study to initiate the validation of the PANQOL scale in French language. Our results are consistent with the literature about tumour growth, but we failed to find any predictive factors of tumour growth probably because of the low power of our study. We are conscious of possible bias because of our population (recruitment bias) and the retrospective nature of our questionnaires. Concerning the PANQOL scale in French Language, our results are encouraging despite certain weaknesses in internal consistency. Furthermore, we did not compare the PANQOL scores to the SF-36 scores as Shaffer et al. and Van Leeuwen et al. did. This is why further studies must be applied to validate the French version of the PANQOL scale [8 9].

The study is divided in two different topics, the natural history of tumour growth and QoL of patients, but this investigation assessed correlations between tumour growth and QoL scores, which justified the decision to join these two aspects in the same study. In a population with a short mean follow up, difference in sizes and locations of tumours represented a bias in our study. In fact, the retrospective nature over a long period of data collection suffers recording and recollection bias amongst many other limitations of these types of study.

Conclusions

Nowadays, conservative management of VS seems to be dependent on QoL. QoL is significantly deteriorated by dizziness, suggesting the benefit of vestibular rehabilitation and non-conservative treatments in patient presenting incapacitating dizziness or vertigo. Finally, this first PANQOL in French language is a validated measure of QoL that needs to be confirmed by further explorations.

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Appendix 1. The French version of the Penn Acoustic Neuroma Quality-Of-Life scale (PANQOL-FR)

	Pas du tout d'accord	Pas d'accord	Indifférent	D'accord	Tout à fait d'accord
1. Ma surdité a affecté mes relations personnelles.	1	2	3	4	5
2. J'ai des difficultés à suivre une conversation à cause de ma surdité.	1	2	3	4	5
3. J'ai des difficultés de concentration à cause de sifflements, de bourdonnements, ou d'autres bruits dans mes oreilles.	1	2	3	4	5
4. J'ai des difficultés sérieuses à cause de mon instabilité.	1	2	3	4	5
5. Je me sens instable ou déséquilibré.	1	2	3	4	5
6. Je me sens tourner ou tomber quand je me lève ou quand je marche.	1	2	3	4	5
7. J'ai des difficultés à changer de direction quand je marche à cause de mon instabilité.	1	2	3	4	5
8. J'ai des difficultés à me déplacer dans le noir.	1	2	3	4	5
9. A cause de mes problèmes d'équilibre, j'ai peur que l'on me croit drogué ou saoul.	1	2	3	4	5
10. Je me comporte différemment avec les gens à cause de mes problèmes d'expression faciale.	1	2	3	4	5
11. Je ressens une gène, des démangeaisons ou un larmoiement à l'un de mes yeux.	1	2	3	4	5
12. J'ai du mal à parler car mon visage est déformé.	1	2	3	4	5
13. Le diagnostic de neurinome de l'acoustique a modifié mes activités quotidiennes.	1	2	3	4	5
14. Je ressens des maux de tête du coté de mon neurinome de l'acoustique.	1	2	3	4	5
15. Je ressens un sentiment d'inquiétude comme si quelque chose de grave allait arriver.	1	2	3	4	5
16. Je suis angoissé.	1	2	3	4	5
17. J'ai l'impression de vivre au ralenti.	1	2	3	4	5
18. J'ai le sentiment d'avoir l'estomac noué.	1	2	3	4	5
19. J'ai des attaques de panique.	1	2	3	4	5
20. Je me sens isolé à cause de mon diagnostic de neurinome de l'acoustique.	1	2	3	4	5
21. J'ai du mal à rester concentré sur une tâche (lire le journal, regarder la télévision).	1	2	3	4	5
22. Je suis devenu plus impatient.	1	2	3	4	5
23. Je me sens épuisé.	1	2	3	4	5
24. J'ai des pertes de mémoires.	1	2	3	4	5
25. Ma santé est excellente.	1	2	3	4	5
26. Je m'attends à ce que ma santé se détériore dans l'année à venir.	1	2	3	4	5