

# Patients' Quality of Life, Reported Difficulties, and Benefits following Surgery for Acoustic Neuroma

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**Objectives:** We compared the quality of life of patients with acoustic neuroma (AN) with general population controls and other chronic illness patients. We also examined the types and significance of ongoing difficulties reported by AN patients and the types of positive benefits following their surgery.

**Design:** A comparative questionnaire survey.

**Methods:** A research questionnaire was sent to all 119 members of the Acoustic Neuroma Association of New Zealand. Responses were compared with those of matched general population controls and type 2 diabetes, recent angina, and dermatitis patients.

**Main Outcome Measures:** The questionnaire contained the SF-36, a measure of the type of difficulties following surgery, as well as a measure of illness benefits.

**Results:** AN patients reported an impaired quality of life compared with general population controls and other chronic illness groups, but AN patients reported better physical and general health outcomes. Hearing was the most frequent reported difficulty following surgery, and this impacted most on social functioning. The majority of patients named at least one positive outcome from their illness. AN patients who had facial difficulties following surgery were less likely to report positive outcomes.

**Conclusions:** Treatment for AN results in a significant reduction in quality of life for patients. The major effect is in the psychological area, with increased rates of emotional distress and impaired social functioning even in comparison with patients with major illnesses. However, most AN patients do report finding some benefit from their illness experience. Patients with facial weakness are at the greatest risk of a poorer psychological outcome.

**Key words:** acoustic neuroma, benefit finding, psychological distress, quality of life

Acoustic neuroma (AN) is a benign tumour that is commonly removed surgically. In most cases, the long-term prognosis is excellent, but surgery can leave patients with hearing loss, disequilibrium, facial weakness, and other functional deficits.<sup>1</sup> Studies examining the quality of life following surgery for AN show the treatment to have a significant negative impact on patients' well-being.<sup>2-4</sup> Research suggests that women and younger patients are at greater risk of developing significant levels of distress over the long term.<sup>4,5</sup>

Previous work has found that quality of life is worse in AN patients when compared with age- and sex-matched controls.<sup>2,3</sup> However, it is not clear from the available literature how patients' levels of well-being compare with those of patients with other chronic illnesses. A recent study found that over half of 53 treated AN patients rated their quality of life to be worse following treatment and 50% reported fewer social activities since their operation.<sup>3</sup> Although the impact of surgery for AN has been well documented, less is known about the relationship between the type of functional deficit and later patient well-being. This information has implications for the type of surgical approach adopted for removing the tumour. Some studies have proposed that facial nerve problems cause the most concern for patients.<sup>6-8</sup> The rates of facial nerve dysfunction following surgery for AN have improved and now affect only a minority of patients.<sup>6,9</sup> However, when facial nerve damage does occur, it typically causes worries about personal appearance and difficulties in social settings by affecting emotional expression and communication. Other

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studies have highlighted the negative influence of hearing and balance problems on quality of life.<sup>10,11</sup>

Recently, researchers in the quality of life area have begun to explore the types of positive changes reported by patients following the diagnosis of a serious illness.<sup>12,13</sup> For example, a study of myocardial infarction and breast cancer patients found the majority to report some positive benefits from their illness. Myocardial infarction patients' most commonly reported benefit was a healthy change in their lifestyle, whereas breast cancer patients were more likely to report improved close relationships.<sup>14</sup> Research suggests that the ability of patients to find benefits from their illness is related to later psychological adjustment and well-being.<sup>15</sup> To date, no research has been conducted on the types of positive benefits reported by patients who have undergone surgical treatment for AN.

In this study, we compared the quality of life of AN patients with that of general population controls and patients from three other illness groups with some overlapping characteristics in terms of the demands they placed on patients. We chose type 2 diabetes because of its similar chronic nature. We also compared AN patients with a recent angina sample because both illnesses are unexpected and frightening to patients. Dermatitis was chosen as both diseases can impact on appearance and self-esteem. We also examined the types and significance of ongoing difficulties reported by AN patients and the types of positive benefits following the diagnosis of their illness.

## Methods and Materials

Eighty-five AN patients were recruited for the study through the Acoustic Neuroma Association of New Zealand. Questionnaires had been sent out to all 119 members of this organization; 91 replies were received (response rate = 76.5%). All participants had to have undergone AN surgery. Since 6 patients had gone through other treatments, these were excluded, leaving the final sample of 85 participants. The sample comprised 66% females and 34% males with an average age of 59 (SD = 10.95 years). Most of the participants who could recall their type of operation reported that they had the translabyrinthine approach (72%). The average time since operation was 6.9 years (SD = 5.7 years).

The questionnaire included background demographic and clinical information. As part of the questionnaire, participants also completed the SF-36 quality of life measure<sup>16</sup> to assess eight aspects of well-being: physical functioning, role limitations owing to physical health, bodily pain, general health perception, vitality, social

functioning, role limitations owing to emotional health, and general mental health. Higher scores reflect a smaller amount of limitations and a better quality of life. The scores from AN patients were compared with the norms for the New Zealand population on the same scale as well as published norms for

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The nature and degree of postoperative functional deficits were assessed by asking patients to rate the level of difficulty that they experienced with 17 possible problems following AN surgery. These items cover facial problems (eight items: facial numbness, facial weakness, difficulty swallowing, difficulty drinking, change in taste, change in smell, difficulty speaking, and eye pain or weakness), hearing problems (four items: difficulty hearing, difficulty with background noise, difficulty localizing sound, and tinnitus), and other problems (headaches, fatigue, memory problems, difficulty concentrating, eye pain or weakness, and balance problems). All items were rated by participants on a 5-item scale from no difficulty (1) to extreme difficulty (5). Scores were calculated for facial and hearing difficulties, as well as a total difficulty score.

The positive outcomes of the illness were assessed using an open-ended question: "Sometimes illness has an unexpected positive effect in some patients. What positive effects, if any, do you feel may have occurred in your life following your surgery for acoustic neuroma?"<sup>14</sup> Based on previous research, responses were classified into six major categories and one residual category.<sup>14-17</sup> The six categories were improved interpersonal relationships, greater appreciation of life, improved empathy for others, reprioritizing of goals, feeling fortunate, and self-improvement.

The data analysis of this study was performed using the statistical evaluation program SPSS version 11.5 (SPSS Inc, Chicago, IL). Participants' data on the eight scales of the SF-36 were compared with total population norms from the New Zealand Health Survey<sup>18</sup> and with three patient groups—namely those with type 2 diabetes, angina, and dermatitis—using *t*-tests and one-way analysis of variance.

## Results

### Quality of Life

We first compared AN patients with the SF-36 norms for the general population. The results of this analysis show AN patients to have a significantly worse quality of life in seven of the eight subscales of the SF-36 when compared with general population controls (Table 1). The vitality, bodily pain, social functioning, and mental health

**Table 1.** Mean Scores on SF-36 Subscales in Acoustic Neuroma Patients, General Population Controls, and Three Comparison Illness Groups

SF-36 Subscales	AN Patients	General NZ Population	Diabetes Type 2	Recent Angina	Dermatitis
Physical functioning	78.8	86.0**	67.7**	63.2**	74.8
Role physical	67.8	80.7**	56.8*	44.2**	56.8*
Bodily pain	64.0	77.9**	68.5	61.6	67.0
General health	76.5	73.8	56.1**	52.0**	60.8**
Vitality	52.6	65.6**	55.7**	48.5**	56.9**
Social functioning	74.9	86.6**	82.0*	80.3	84.2**
Role emotional	73.9	85.0*	75.6	70.2	78.7
Mental health	63.2	78.0**	76.7**	73.0**	76.5**

AN = acoustic neuroma; NZ = New Zealand.

\* $p < .05$ ; \*\* $p < .01$ .

subscales showed the greatest level of deficit when compared with controls.

We next compared AN patients with the three different illness groups. When compared with the type 2 diabetes and dermatology groups, AN patients showed a better outcome in the physical and general health subscales but a worse score on vitality, social functioning, and mental health (see Table 1). When compared with angina patients, AN patients again showed better outcomes in the physical and general health and vitality scales, but a worse outcome was noted in the mental health subscale. Overall, AN patients showed a significantly impaired quality of life when compared with general population controls, but when compared with other illness groups, they reported fewer limitations in physical functioning but worse psychological outcomes.

### Functional Difficulties

We analyzed the pattern of functional difficulties reported by AN patients by examining the frequency of hearing, facial, and other difficulties reported at a moderate or above level (Figure 1). As can be seen from Figure 1, the most significant problems reported by AN patients were in the area of hearing problems, followed by difficulties with balance and eye pain or weakness, facial weakness, and facial numbness. Over 90% of AN patients reported problems localizing sound and hearing when there is background noise, and over 60% of patients reported difficulty with tinnitus.

To examine the impact of reported difficulties on quality of life, we analyzed the correlations between the difficulty scores for hearing problems and facial problems and the total difficulties with the individual SF-36 subscales (Table 2). The pattern of correlations shows that

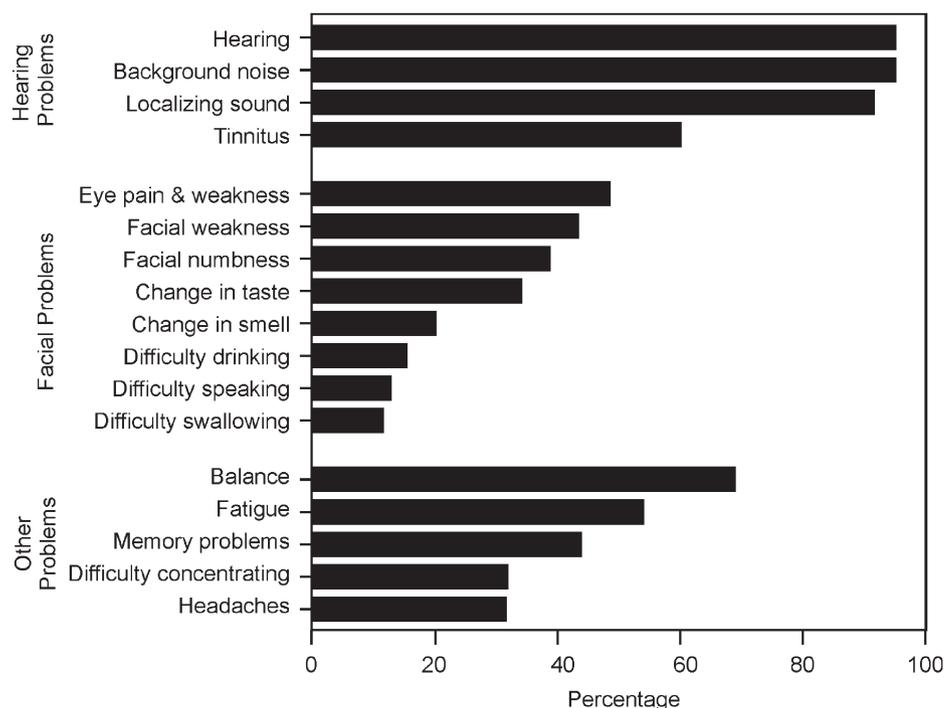
hearing difficulties had the most impact on social functioning, whereas facial problems most affected physical functioning. The total number of difficulties reported by AN patients were negatively associated with physical, social, and emotional domains. 4

### Reported Benefits

Overall, 81% of AN patients listed at least one positive benefit following their diagnosis and treatment. Two positive effects were mentioned by 45%, whereas 19% of patients listed three or more benefits. The most frequently reported positive aspect was a greater appreciation of life (33%), followed by improved interpersonal relationships (30%), improved empathy (22%), feeling fortunate to be alive (12%), reprioritizing aspects of their life (12%), and self-improvement (10%). We examined whether patients who reported benefits from their illness differed from those who did not report any benefits on their quality of life scores and difficulties following surgery. There were no demographic differences or differences on any of the eight SF-36 quality of life scales. However, patients who had higher levels of facial difficulties were more likely not to report any positive benefits from AN ( $t(76) = 2.27$ ,  $p = .03$ ). There was no difference on the reporting of benefits on hearing or other difficulties.

### Discussion

This study found that AN patients have an impaired quality of life compared with a matched general population group. When AN patients' quality of life was compared with that of other diabetes, angina, and dermatitis patients, we found a mixed picture. Psychological outcomes in AN patients were generally



**Figure 1.** Difficulties following surgery (rated moderately or above).

worse when compared with the other illness groups, but AN patients reported better physical and general health outcomes.

We further found that hearing was the most significant reported difficulty following surgery and that hearing deficits impacted most on social functioning. It should be noted that many AN patients experience some hearing loss prior to surgery, and it cannot be stated with certainty that the reported hearing loss is solely due to the surgical procedure. However, if AN patients reported facial nerve problems, then these tended to be associated with other physical limitations. Although most patients reported impaired quality of life, the majority of patients named at least one positive benefit from their illness. The largest percentage of positive effects was reported in the areas of a greater appreciation of life and improved interpersonal relationships. The results also showed that AN patients who had facial weakness following surgery were less likely to report positive outcomes.

The impaired quality of life reported in our sample is consistent with other research in the area.<sup>1-4</sup> The pattern of results highlights the fact that compared with other major illnesses, the major difficulty lies in the psychological area. Although AN patients are less functionally impaired, they report more difficulties in social interactions and with emotional distress than patients with other illnesses. Although much of the quality of life research in AN patients has focused on hearing problems, which tend to be more frequent,<sup>10</sup> when patients suffer facial weakness, this symptom appears to have a more significant impact on well-being. In this study, AN patients who reported facial difficulties had more physical limitations and were less likely to find any positive benefits from their illness.

The pattern of benefits reported by patients is similar to that of patients who have been diagnosed with cancer, who tend to report a greater appreciation of life, closer relationships with significant others, and a reorganization

**Table 2.** Correlations of the Three Difficulties Scores with the Eight SF-36 Subscales

Difficulties	Physical Functioning	Role Physical	Bodily Pain	General Health	Vitality	Social Functioning	Role Emotional	Mental Health
Hearing	-.14	-.27*	-.16	-.18	-.12	-.37**	.30*	-.03
Facial	-.40**	-.09	.01	-.31**	.04	-.18	.17	-.12
Total	-.46**	-.33**	-.13	-.41**	-.08	-.37**	-.35**	-.11

\* $p < .05$ ; \*\* $p < .01$ .

of life priorities.<sup>14,19</sup> A number of studies have shown that the ability to find benefits from the illness experience predicts better adjustment over the long term. This also highlights the fact that AN patients who report facial difficulties would be at greater risk of poorer adjustment.

It should be acknowledged that the study is limited by the cross-sectional nature of the data and the variable follow-up time since surgery. Although the response rate for the study was excellent, it should be noted that the sample was also drawn from the major AN support group in New Zealand, which may represent a selection bias as not all AN patients who have had surgery are members of the association.

## Conclusion

This study highlights a significant reduction in quality of life for patients who have undergone surgical treatment for AN. However, it is not possible from the current study to determine whether this decrement was due to the disease or treatment. The major effect is apparent in the psychological area with increased rates of emotional distress and impaired social functioning even in comparison with patients with type 2 diabetes, dermatology, and recent angina. Most AN patients report finding some benefit from their illness experience. Patients with facial weakness are at a greater risk of a poor psychological outcome.

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