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NEED FOR FACIAL REANIMATION AFTER OPERATIONS FOR VESTIBULAR  
SCHWANNOMA: PATIENTS PERSPECTIVE

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**Abstract.** A total of 779 patients operated on for vestibular schwannoma mostly by the translabyrinthine approach in Denmark during the period 1976–2000 answered a questionnaire about various postoperative consequences. In this paper we describe the patients' facial function evaluated by professionals one year postoperatively and self-evaluated by each patient according to the House-Brackmann scale at the time of the questionnaire. The patients' self-evaluation was more pessimistic than that of the professionals with 26% reporting House-Brackmann grade IV–VI, compared with 20%. One hundred and seventeen (15%) of 779 patients considered their facial palsy to be a big problem and 125 patients (16%) were interested in surgical treatment for the sequelae of facial palsy. Seventy-eight (10%) had already had some kind of operation, usually the VII–XII coaptation. Thirty-three of 61 patients who had already been operated on for facial palsy were interested in further surgical treatment. One hundred and ninety-five patients (25 %) had some kind of operation on the eye, mostly (88%) a tarsorrhaphy. Reanimation procedures such as a palpebral gold weight or a spring, apparently still have a small place in Denmark. In conclusion, there seem to be a considerable and unmet need for surgical reanimation of facial function in patients with facial palsy after operations for vestibular schwannoma in Denmark.

**Key words:** facial palsy, reanimation of the face, vestibular schwannoma surgery.

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The aim of this paper is to describe the need for treatment of the consequences of facial palsy from the view of patients operated on for vestibular schwannoma and based on a questionnaire sent by mail.

Most surgeons are concerned with lesions of the facial nerve during operations for vestibular schwannoma and much is done to prevent damage to the nerve during removal of the tumour. If the facial nerve is cut during the operation, most surgeons try to coapt the nerve. However, there will always be a number of patients who are left with a severe facial palsy. These patients may not be given proper information about the possibilities of surgical treatment of the consequences of facial palsy. In this study we have investigated the need for reanimation after facial nerve palsy in patients operated on for vestibular schwannoma in Denmark, using a questionnaire.

## PATIENTS AND METHODS

A total of 1008 patients were operated on for vestibular schwannoma during the 25 year period 1976–2000. Nine hundred and forty-seven (94%) were operated on by the translabyrinthine approach and the rest through a middle fossa or the sub-occipital approach. The follow-up period was up to three months if postoperative facial function was normal, and in all cases of facial palsy or other complications until stabilisation of the condition or at least one year. The facial function was graded according to the House-Brackmann (H-B) classification (3) (Table I).

During the period May 2000 to January 2001, a questionnaire was mailed to all patients (except 149 patients who had died, 40 who were foreigners or who had emigrated, and one patient who could not be found).

Table I. *The House-Brackmann grading system (3)*

Grade
I. Normal Normal facial function in all areas.
II. Mild dysfunction Slight weakness noticeable only on close inspection. At rest: normal symmetry and tone. Motion: normal movement of forehead; ability to close eye with minimal effort and slight asymmetry; ability to move corners of mouth with maximal effort and slight asymmetry. No synkinesis, contracture, or hemifacial spasm.
III. Moderate dysfunction Obvious but not disfiguring difference between two sides; no functional impairment; noticeable but not severe synkinesis, contracture, or hemifacial spasm. At rest: normal symmetry and tone. Motion: slight to no movement of forehead; ability to close eye with maximal effort and obvious asymmetry. Patients who have obvious but not disfiguring synkinesis, contracture, or hemifacial spasm are grade III regardless of degree of motor activity.
IV. Moderately severe dysfunction Obvious weakness and/or disfiguring asymmetry. At rest: normal symmetry and tone. Motion: no movement of forehead; inability to close eye completely with maximal effort; asymmetrical movement of corners of the mouth with maximal effort. Patient with synkinesis, mass action, and hemifacial spasm severe enough to interfere with function are grade IV regardless of degree of motor activity.
V. Severe dysfunction Only barely perceptible motion. At rest: possible asymmetry with droop of corner of mouth and decreased or absent nasal fold. Motion: no movement of forehead; incomplete closure of eye and only slight movement of lid with maximal effort; slight movement of corner of mouth. Synkinesis, contracture, and hemifacial spasm usually absent.
VI. Total paralysis Loss of tone; asymmetry; no motion; no synkinesis, contracture, or hemifacial spasm.

The questionnaire consisted of various questions about quality of life and typical problems patients might have after operations for vestibular schwannoma. One part of the questionnaire was about the function of the facial nerve. Patients were asked several questions about their ability to move the different parts of the face, such as smiling without closing the eye, and whistling. Secondly, they were asked to rate themselves according to the H-B grading scale (3), by using a mirror. Each point was carefully explained in the questionnaire, which was written in

lay terms. The patients facial function was evaluated by professionals one year after surgery and also self-evaluated by the patients in the questionnaire. A former study had shown that patients and physicians evaluation do not differ that much, although the patients seem to be somewhat more pessimistic than the professionals (1).

Finally, the patients were asked if they had had previous operations or if they wanted an operation to improve the consequences of facial palsy, and further to specify which previous operations they had had.

Table II. *Self-evaluated facial function in patients with or without known professional evaluation of facial function after 1 year*

Data are number (%) of patients.

Grade	Professional evaluation after 1 year ( <i>n</i> = 625)	Self-evaluation	
		With known grade after 1 year ( <i>n</i> = 625)	With unknown grade after 1 year ( <i>n</i> = 154)
HB I	350 (56)	200 (32)	54 (35)
HB II	94 (15)	137 (22)	37 (24)
HB III	56 (9)	100 (16)	17 (11)
HB IV	31 (5)	63 (10)	14 (9)
HB V	31 (5)	75 (12)	20 (13)
HB VI	63 (10)	25 (4)	5 (3)
Not known	0	25 (4)	7 (5)

Table III. Various functional consequences of facial palsy in patients with self-evaluated House-Brackmann grade of more than I

Data are number (%) of patients.

Function	Total No. answered	Yes	No
Dry eyes	382	222 (58)	160 (42)
Weeping when eating	376	143 (38)	233 (62)
Blurred vision	376	192 (51)	184 (49)
Sensitive to light	372	74 (20)	298 (80)
Eye infection	369	125 (34)	244 (66)
Pronunciation difficulties	375	139 (37)	236 (63)
Drooling	375	124 (33)	251 (67)
Dry mouth	371	122 (33)	249 (67)
Unable to take solid food	370	78 (21)	292 (79)
Unable to drink	376	109 (29)	267 (71)

Finally, a separate part of the questionnaire dealt with operations on the eyes.

## RESULTS

The median age at the time of operation was 61 years (range 15–91). The patients answered the postal questionnaire at a median of 12 years (range 2–25) postoperatively. Seven hundred and seventy-nine (95%) of the 818 patients responded. The median age at the time of the questionnaire was 64 years (range 24–94). A total of 625 patients (80%) of the 779 patients who had answered the questionnaire had a known professional H-B grade after one year (Table II). The reasons for a lack of professional H-B grading after one year was either a recent operation, lack of data, or the fact that some patients were followed up in the neurosurgical outpatient clinic, where patients are not always evaluated according to the HB-grading system.

As shown in Table II, there were only minor differences in the self-evaluated H-B grading between the group of patients with known and the group with unknown H-B grading after one year.

### Professional compared with self-evaluation of facial function

In the professionally evaluated group there were considerably more patients ( $n = 350$ , 56%) with no palsy (H-B grade I) after one year compared with the self-evaluated group ( $n = 200$ , 32%). However, there were also more patients with H-B grade VI, ( $n = 63$ , 10% compared with 19 (3%) and 25 (4%) in the self-evaluated groups). The professional evaluation corresponds quite well with results of earlier studies (4). Only 25 (4%) of the professionally evaluated patients did not rate themselves. By professional evaluation 15 (60%) of these patients had H-B grade I, one year postoperatively.

### Functional consequences of facial palsy

Table III shows the various functional consequences of facial palsy in patients with self-evaluated H-B grade more than I, as only patients with some degree of palsy were asked to answer these questions. Two hundred and twenty-two (58%) of the patients had dry eyes and blurred vision on the operated side. About 110–120 (30%) have problems with movement of the mouth.

Ninety-six patients (15%) said that facial palsy was a great problem. Table IV shows their professionally and self-evaluated H-B grade. Most of these patients rated themselves as having a severe palsy, with 74 (78%) as grade HB IV–VI (only 58 (60%) in the professionally evaluated group). However, 14 (15%) rated H-B grade III and eight (8%) grade I or II.

### Patients who wanted surgical treatment to improve facial function

The patients were asked if they were interested in surgical treatment if it could improve the consequences of facial palsy, 97 (16%) answered that they were and Table V shows their professionally and self-evaluated H-B grades. Again, there is a tendency to a more severe

Table IV. Number (%) professionally and self-evaluated House-Brackmann (H-B) grades in the 96 patients who consider their palsy to be a great problem currently

H-B grade	Evaluation	
	Professional	Self
I	7 (7)	1 (1)
II	16 (17)	7 (7)
III	15 (16)	14 (15)
IV	12 (13)	22 (23)
V	13 (14)	36 (38)
VI	33 (34)	16 (17)

Table V. Number (%) professionally and self-evaluated House-Brackmann (H-B) grades in the 97 patients interested in surgical treatment of the consequences of facial palsy

H-B grade	Evaluation	
	Professional	Self
I	9 (9)	0
II	21 (22)	8 (8)
III	11 (11)	23 (24)
IV	9 (9)	22 (23)
V	12 (12)	29 (30)
VI	35 (36)	15 (15)

Table VI. Previous operations for the consequences of facial palsy in 61 patients

	No. (%) of procedures
End-to-end coaptation of the facial nerve	9 (15)
VII-XII coaptation	33 (54)
Cross-face nerve graft	7 (12)
Neurovascular free muscle transfer	8 (13)
Muscle transposition	3 (5)
Fascia lata slings	1 (2)
Face lift	19 (31)
Operation not specified	3 (5)
Total	83

self-evaluation than the professional evaluation. In the self-evaluated group, most of the patients rated themselves as H-B grade III-IV. None rated them-

selves as H-B grade I, compared with nine patients in the professionally evaluated group. Only 15 patients rated themselves as H-B grade VI, compared with 35 by professional evaluation.

#### Previous operations for facial reanimation

Sixty-one patients (10%) had had 83 previous operations for the consequences of facial palsy (Table VI).

Thirty-three (54%) of the 61 patients who had already been operated on for facial palsy said that they were interested in further surgical treatment, if it could reduce their problems (Table VII). Table VIII shows the professional H-B grade a year after removal of vestibular schwannoma in the 61 patients who were subsequently operated on again. The table shows that it was only patients with severe palsy who were treated by extensive dynamic procedures (such as microneurovascular free muscle transfer).

#### Previous operations on the eye

One hundred and fifty-seven (25%) of the patients had 167 surgical procedures around the eye (Table IX). Seventy-eight (50%) were satisfied with the eye surgery, whereas 43 (27%) were not satisfied (36, 23%, did not respond to this question). Forty of the 43 patients who said that they were not satisfied had only had a tarsorrhaphy.

## DISCUSSION

It is striking that 56% of the patients were evaluated by professionals as having normal facial function at one year compared with only 32% by the patients them-

Table VII. Previous operations and patients who wanted further surgical treatment (n = 33)

Previous operation	Total No.	No. of patients who wanted further surgical treatment
End-to-end coaptation of the facial nerve	9	3
VII-XII coaptation	33	19
Cross-face nerve graft	7	4
Neurovascular free muscle transfer	8	2
Muscle transposition	3	3

Table VIII. House-Brackmann (H-B) grades in patients with specific previous operations

H-B grade	No. of patients	Operation
I	0	
II	3	Facelift
III	3	Facelift, VII-XII coaptation
IV	4	Facelift, VII-XII coaptation, muscle transplantation
V	11	Facelift, VII-XII coaptation, muscle transplantation, cross-face nerve graft
VI	40	Facelift, VII-XII coaptation, muscle transplantation, cross-face nerve graft, muscle transposition, fascia lata slings

Table IX. Operations on the eyes

Operation	No. (%) of procedures
Tarsorrhaphy	138 (88)
Gold weight implantation	4 (3)
Palpebral spring implantation	3 (2)
Blepharoplasty	10 (6)
Lifting of the eyebrow	8 (5)
Tendon transposition	1 (1)
Tightening of the lower lid	1 (1)
Operation not specified	2 (1)
Total	167

selves. In some cases there is such a discrepancy between the two evaluations of the same patient, that the question arises as to whether it is possible for the facial function to improve or deteriorate drastically one year or more after the facial nerve has been damaged. In these cases the patients will be invited for a professional re-evaluation. Only a few of the patients who had a professional evaluation did not evaluate their own facial function. A considerable proportion of these non-responding patients may not have compromised function of the facial nerve, as reading of their questionnaires gave the impression that the patients did not bother to answer this section. A further 60% had no palsy at the professional evaluation after one year. This implies that the patients self-evaluation of facial function is somewhat more pessimistic than the professional evaluation. On the other hand it is interesting that there are over twice as many patients with H-B grade VI in the professionally evaluated group. This may be an indication that some of the patients in this group have improved their facial function after the evaluation at one year.

The large percentage of patients who did not respond to the questions concerning the particular consequences of facial palsy is because only patients with H-B grade higher than I were asked to answer these questions. In the group of 96 patients (Table IV) who considered their palsy to be a great problem, one patient rated H-B grade I and seven patients H-B grade II, which is only a slight palsy. The one patient with H-B grade I specified that she had problems with dryness of the eye on the side that had been operated on. In these cases, the answers often gave the impression that a patient with little or no palsy could still have isolated problems with movement of separate parts of the face, or dryness of the eye. Regarding the group of patients who wanted a further operation (Table V), it is interesting that nine were listed as having H-B grade I on professional evaluation. If this is true, it seems strange that patients with no palsy would want an operation. Again there are over twice as many patients with H-B grade VI in the professionally evalu-

ated group. As mentioned above, some of these patients might have improved their facial function after the one-year evaluation.

If a patient's wish for further surgical treatment can be seen as dissatisfaction with previous restorative operations, it is interesting that 58% of patients with VII to XII coaptation should wish for a further operation. This is a procedure that is often used by the otologists and neurosurgeons, although one of the drawbacks is that it gives only voluntary movement.

A few of the patients who had cross-face nerve grafting are waiting for free muscle transfer, which could be the reason for their wish for a further operation. This procedure often does not give sufficient reinnervation by itself. Muscle transposition has drawbacks compared with free muscle transfer as it does not give spontaneous movement, which may be a reason for dissatisfaction.

When it comes to surgery on the eye, the most common procedure by far is tarsorrhaphy. A drawback of tarsorrhaphy is that it merely holds the lids closed in a disfiguring position. It does not re-animate like the palpebral spring, gold weights, or muscle transposition or transplantation, which should be the methods of choice for longstanding facial palsy. To protect the eye during a shorter period, non-surgical methods such as a bandage, contact lens, moisture chamber, or weights stick to the upper eyelid with tape might be good options.

## CONCLUSION

There is a considerable and hitherto unmet need for surgical reanimation of impaired facial function after operations for vestibular schwannoma in Denmark, as self-evaluated by patients through a questionnaire.

The aim of further studies is to invite the patients interested in surgical treatment to a personal interview, rate them according to the H-B grading scale and by an objective three-dimensional video analysis system (2), and in this way select candidates for plastic or ophthalmological surgery. Those eventually operated on will be re-evaluated postoperatively by the three-dimensional system, which is highly sensitive to even small changes in facial function, to make an objective evaluation of the improvement of their facial function (2). For patients with complete paralysis, cross-facial nerve grafting followed by microvascular muscle transfer is the method of choice to cause spontaneous movement of the paralysed side. For patients who are not candidates for these extensive procedures, symmetry of the face can be restored with one of several static procedures. We think that more emphasis should be laid on the satisfaction of the patient in the judgement of therapeutic success, as well as on the

wish for surgical reconstruction of facial function. Despite improvements in surgical techniques and in the results of vestibular schwannoma resection, there will always be a considerable number of patients who will end up with severe facial palsy. These patients are not always made aware of the possibility of subsequent plastic and eye surgery in our country. As surgeons who cause postoperative disability, we have an obligation to refer patients with irreversible facial palsy to an evaluation by a plastic or eye surgeon, or both. In addition, the plastic and eye surgeons have an obligation to communicate their experience and results of treating of this group of patients.

## REFERENCES

1. Buchwald C, Tos M, Thomsen J et al. Observer variations in the evaluation of facial nerve function after acoustic neuroma surgery. *J Laryngol Otol* 1993; 107: 1119–1121.
2. Frey M, Giovanoli P, Gerber H, Slameczka M, Stussi E. Three-dimensional video analysis of facial movements: a new method to assess the quantity and quality of the smile. *Plast Reconstr Surg* 1999; 104: 2032–2039.
3. House JW, Brackmann DE. Facial nerve grading system. *Otolaryngol Head Neck Surg* 1985; 93: 146–147.
4. Thomsen J, Tos M. Management of acoustic tumors. *Adv Otorhinolaryngol* 1989; 3: 153–194.