Int. Adv. Otol. 2013; 9:(2) 227-231

CLINICAL REPORT

Surgical Treatment for Severe Facial Nerve Impairment

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Objective: The chances of full recovery from a facial nerve paralysis, depending on the varying pathologies, can be determined depending on the extent of the impairment. Very often, especially in mild to moderate cases, the recovery is good. However, in clinical practice we cannot rely on overall statistics for such a devastating symptom. We need to individualise the problem. Some of the questions we need to ask ourselves are: can we identify the patient who will be left with a poor outcome? If so, can this outcome be prevented with a surgery?

Patients: This presentation describes three patients with severe paresis - different causes- who opted for surgical intervention.

Intervention: Decompression surgery

Main Outcome Measure: Patient satisfaction

Results: All three patients were pleased with the option of surgical intervention and satisfied with the result.

Conclusions: The option of surgical decompression should be discussed with patients in case of severe nerve impairment.

Submitted : 10 May 2013 *Revised : 22 May 2013* *Accepted : 25 May 2013*

Introduction

Facial nerve paralysis is a condition that leads to severe morbidity. It can be caused by a lot of different pathologies; often it is of infectious –for example varicella zoster, Lyme disease, acute otitis- or traumatic (including iatrogenic) origin. Frequently the paralysis can be idiopathic, so no cause is found despite clinical investigation. This is traditionally called Bell's palsy. Evidence suggests that it is a herpes simplex viral infection that leads to Bell's palsy. Other causes can be cholesteatoma and malignant parotid gland tumours.

Despite many published studies there still is a lot of debate regarding the best treatment for facial nerve palsies. This is the case with the many different causes and it concerns both medication and surgical interventions. Surgical treatment remains controversial because of issues of patient selection criteria, site of decompression, limited numbers of patients who need decompression and the inability to transfer results from study to study. [1,2]

Facial nerve function in case of Bell's palsy has a rather good chance of recovery especially in younger patients and in case of non-severe paresis. This recovery can be enhanced especially with corticosteroids up to 90% of all patients. [3] In most cases of traumatic paresis the overall outcome is this good as well. So because of a ceiling effect, it will be very hard to establish an even better outcome with antiviral medication or surgical decompression; though there still might be patients, in

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our opinion, that need more than just the corticosteroids or 'watchfull waiting'.

In clinical practice we cannot rely on overall statistics for such a devastating symptom. We need to individualise the problem for the patient in front of us. The questions then are: can we identify the one patient who will be left with a poor outcome? If so, can this outcome be prevented with a surgical decompression? And, is the timing critical and which surgical procedure should be used?

If a person suffers facial nerve impairment, the chances of full recovery can be determined fairly accurately depending on the extent of the impairment. In mild to moderate cases the recovery is usually good. However, in case of total paralysis, probably independent of the cause, the chance of a full recovery is getting worse. [3]

Electroneurography (ENoG) and electromyography (EMG) can probably help in predicting the outcome. [1,3,4] In case of Bell's palsy, all patients with less than 90% denervation on EnoG have a good outcome.

If the degree of loss of the compound muscle action potential (CMAP) shows a difference of more than 95% between the affected side and the healthy side, or if there are signs of denervation / no voluntary movement potentials, the chance of full recovery diminishes drastically. Hato has recently shown that, of a group with Bell's palsy and 95% denervation using ENoG, only 23% made a good recovery if no decompression took place, despite the use of prednisone. Following their new decompression technique the recovery rate was 75%, using conventional surgery it was 44%. [3]

For measuring facial nerve function, usually the House-Brackmann (HB) grading scale is used. [5] However, this is a somewhat rough instrument. It was especially designed to measure facial function following cerebellopontine angle surgery and it was validated on a small group of patients. Patients are classified according to only 6 categories. [6-8] We, like others, think that it might not be delicate enough; especially not to measure the more subtle differences in outcome needed to properly answer the underlying question of this manuscript: can surgical decompression ameliorate outcome in specific cases of severe palsy. Furthermore, it lacks a subjective component that might be very relevant in the case of this morbidity. Following surgery, outcome was often classified as HB III in literature, but this is a very wide category. [8]

Therefore other grading systems have been developed offering more variety in scoring of facial nerve function. We use the MoReSS grading scale, that scores symmetry in motion, symmetry in rest, secondary defects like synkinesis, and gives an opportunity for subjective scoring. [9] Perhaps, patient satisfaction might be a better outcome than doctor satisfaction with this type of pathology. [10] In the past, also a reliable patient-graded instrument, the facial clinimetric evaluation (FaCE), was developed for the assessment of severity of palsy. [11] We prefer the combination of physician-grading and patient-grading as in the MoReSS. A comparison between a Numerical Rating Scale of 10 points and the FaCE scale is not available as far as we know. However, we think that these will concur quite well.

As an illustration, this article describes three patients with severe paresis, each with a different cause. All three showed more than 95% difference in the CMAP, at least two weeks after the paresis occurred, and opted for surgical intervention.

Case Report

The first patient was a thirty-two-year-old woman. During pregnancy, she suffered from acute otitis media (AOM), which led to paralysis. As she was pregnant, the hospital where she was being treated did not want to operate. In second instance, after the otitis had improved, no surgery was carried out either, because it was felt that this would no longer improve her recovery. When she visited our hospital, a month after the impairment had started, it was classified as an MO11 Re5 S0 S8 (HB V / VI). There is a slight discrepancy between the total impairment shown by ENoG and the Mo score of 11 rather than 12. In retrospect, we think that it is possible that the 'non-total' impairment score was due to a relaxation of the levator palpebrae muscle, and not an active contraction of the orbicularis oculi muscle. There was no blink reflex and the CMAP could not be evoked. Electromyography (EMG) did show denervation potentials, but no voluntary movements.

This was a reason enough to carry out decompression as described by Yanagihara. [12,13] A transmastoid decompression of the facial nerve was performed from the geniculate ganglion to the stylomastoid foramen. The incus was temporarily removed. There was some pus-like discharge near the second geniculum of the facial nerve. The nerve sheath was not incised. Three months later, during follow-up, the patient was beginning to feel slight movements. The paresis was classified as Mo7 Re5 S1 S5 (HB IV). A course of mime therapy was then started. More than a year later, the facial nerve impairment was classified as an MO7 Re3 S1 S3 (HB III). Hearing loss was around 10dB on average in the speech-range frequencies. Looking back, the patient is still glad that she opted for surgery.

The second patient was a 23-year-old soldier who was seriously wounded in Afghanistan. Facial nerve injury was at first not noticed, or at least not treated, probably because he was intubated and due to other serious injuries. His mother said that when she first saw him, which was a week later when he was transferred to our hospital, she thought that his face was distorted somewhat by the oxygen mask. A CT scan showed a metal fragment in the course of the facial nerve in the parotid gland. Physical examination showed total paralysis. EMG showed no voluntary movements. The CMAP showed an impairment of more than 95%. The decision was made to expose the facial nerve and remove the fragment. A standard parotidectomy incison was made and the facial nerve was identified near its origin from the stylomastoid foramen making use of the digastric muscle and the tracheal cartilage (pointer). During the operation, it became clear that the fragment, which was touching it, irritated the nerve. It is possible that several axons had been severed, but the granulation tissue around the nerve made it impossible to know for sure. The piece of metal was removed and the nerve was left untouched. On the first evening after the operation, the patient already noticed a slight "tension" in his facial muscles. After four months, the classification was Mo5 Re1 S0 S3 (HB III). After more than a year, it was Mo5 Re2 S1 S3 (HB III). Especially in view of the difference noticed by the patient immediately post-operatively, he is glad that he opted for surgery.

The third patient developed a paresis on the basis of the Ramsay Hunt syndrome, during his deployment to Afghanistan. Upon his return to the Netherlands, the impairment was classified as MO12 Re6 S2 S9 (HB VI).[14] The CMAP showed an impairment of more than 95%. There was no response to stimulation with electrodes and there was only minor spontaneous activity, despite the fact that the patient had been given prednisone and antivirals. An MRI scan showed that there was hyperintensity in the vertical course of the facial nerve through the mastoid process towards the stylomastoid foramen. This was the reason to carry out decompression of just this mastoid section. The course through the middle ear was not treated, as the patient did not want to run any risk of hearing loss because of the nature of his job. This patient also said that he felt there was more tension in his face in the evening immediately after surgery. After three months, the facial nerve had improved to an MO3 Re3 S1 S2 (HB II). He had some slight synkinesis. This patient, too, is very glad that he opted for surgery.

Discussion

The three patients as described above are not the ultimate proof that decompression for severe paresis/palsy is beneficial. But, that is not the purpose of this manuscript. What we especially would like to show is that patient satisfaction –independent of the cause- can be very high with surgery. Also in literature there still is no hard evidence that the one treatment is much better than the other. This has to do with inconsistency of reporting in studies (grading scale and electrodiagnostic testing), but this can be due to the capacities of each individual physician as well. [2,15,16] Moreover, until now no studies specifically mentioned patient satisfaction in the evaluation of surgical therapy. In our opinion, patient satisfaction is one of the most important outcome measures with this pathology. Therefore, the outcome of the Subjective score of the MoReSS is very important. Two of these patients scored a 3 and one a 2. In retrospect, all three patients have indicated that, if faced with the same situation again, they would certainly opt for surgery. They are very pleased with the results, even though none of the cases made a full recovery. Patients two and three both said that they feel that the result

would not have been as good without surgery. Of course this may be a biased remark, made by people who actually underwent the surgery, but it is a remarkable one.

There is much debate surrounding the effect of facial nerve decompression surgery. [16] There were also extensive discussions among ENT specialists regarding the treatment of our particular patients. The decision to operate was made in good consultation with the patients and after they had been provided with extensive information concerning the risks involved in this type of surgery and the difficulty of predicting the outcome of surgery in a specific case.

Also much debate exists concerning the question which cases of facial paralysis should be operated on. Given the risks involved, this is understandable. Particularly in cases of Bell's palsy, there is considerable hesitancy in this respect, even though it is still possible that the more severe cases will make a better recovery after decompression. But, due to the myriad of possible causes, and the relative rarity of very severe cases, it is difficult to set up major comparative studies. Furthermore, blinding is difficult and perhaps even undesirable.

In many studies, it has been customary to leave the choice up to the patient. [1,12,13] This choice might lead to more younger and possibly healthier patients opting for surgery. It is therefore possible that the picture of the difference in the groups, on the basis of a greater a priori chance of recovery, is flawed. However, it cannot be ruled out entirely that it is the patients with more severe nerve impairment who opt for surgery and that this group would be worse off with an expectative policy.

Even in the more severe cases, fortunately there is a tendency, even after a longer period of time, for patients who undergo surgery to do well, and certainly to do no worse than those who are not operated on. [17-19]

On the basis of this experience, our opinion is that the option of decompression surgery should be discussed with patients with severe nerve impairment. The same should be done if a conservative policy, for instance with corticosteroid and/or antiviral treatment, does not lead to sufficient recovery. Although, it seems quite logical that surgery in an early stage might be advantageous over prolonged waiting, both our patients and literature show that surgery can be beneficial after more than 14 days. This means that when in doubt, there is some time to wait for possible spontaneous recovery, to do all the necessary work-up (ENoG, EMG and CT or MRI) and to inform the patients well.

Lastly, we recommend the use of a classification system that is more sensitive in detecting minor differences when this type of surgery is used. Subjective grading in particular is required. This will better reflect the patient's perspective in illnesses that may result in a dramatic morbidity. [9]

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