Neurochirurgie xxx (2017) xxx–xxx

Disponible en ligne sur
ScienceDirect
www.sciencedirect.com

Elsevier Masson France
EM|consulte
www.em-consulte.com

Original article

Microvascular decompression for hemifacial spasm: Outcome on spasm and complications. A review

M. Sindou [a], P. Mercier [b,*]

[a] Clinique Bretéché, groupe ELSAN, university Lyon 1, 44000 Nantes, France
[b] Department of anatomy, UFR de médecine, university of Angers, rue haute de Reculée, 49045 Angers cedex, France

ARTICLE INFO

Article history:
Received 11 October 2017
Received in revised form
28 December 2017
Accepted 7 January 2018
Available online xxx

Keywords:
Hemifacial spasm
Microvascular decompression
Outcome
Complications

ABSTRACT

Over the last decades microvascular decompression (MVD) has been established as the curative treatment of the primary Hemifacial Spasm (HFS), proven to be linked in almost all cases to a neurovascular compression of the facial nerve. Because the disease is not life-threatening and MVD not totally innocuous, efficacy and safety have to be weighted before decision taken of indicating surgery. The authors have been charged by the French Speaking Society of Neurosurgery to conduct a detailed evaluation of the probability of relief of the spasm that MVD is able to obtain, together with its potential complications. For the review, the authors have gone through the reports available from the Pubmed system. Eighty-two publications have been read and analysed, totalizing more than 10,000 operated cases. In most series, the percentage of patients with total relief ranged between 85% and 90%. Relief was obtained after a certain delay in as many as in 33% ± 8% of the patients in many series. For those, delay lasted around one year in 12% of them. When effect of MVD was considered achieved, relief remained permanent in all but 1%–2% of the long-term followed patients. As regards to complications, risk of permanent cranial nerve deficit was evaluated at 1%–2% for facial palsy, 2%–3% for non-functional hearing loss, 0.5%–1% for lower cranial nerve dysfunction. Risk of stroke was at 0.1% and mortality at 0.1%. CSF leakage and related complications could be reduced at less than 2% in most series provided careful closing techniques be applied. Complications were at a higher rate in repeated MVD. MVD is an effective curative method for almost all the patients affected with primary HFS. Because MVD for HFS is functional surgery, scrupulous consideration of its potential risks, together with the ways to avoid complications are of paramount importance. When MVD is estimated to have failed, it is wise to wait one year before considering to repeat surgery, as number of patients may benefit from delayed effect. This is the more so as important as repeated surgery entails a higher rate of complications.

1. Introduction

Effect of MVD is easy to ascertain clinically by simple observation of the patient's face. In the few individuals with incomplete relief, quantification may be established by EMG examination.

Main difficulty is to define the time from surgery sufficient to consider effect of MVD completed. As a matter of fact a high proportion of patients have a delayed cure that may range from a few weeks or months to one year or even a couple of years. There is a general consensus to estimate that one year from surgery is a reasonable delay for concluding an effect.

Another concern to evaluate outcome and compare results between series is the lack of uniformly admitted scoring system. Among the many modes to quantify relief on spasm, the most currently used is the percentage of residual twitches after surgery. In all publications excellent result was 100% relief. Percentage for being qualified good result was diversely appreciated by the different authors: from 90%–75%. Also according to publications, improvement corresponded to a relief ranging between 90% and 50%. Under 50% relief most authors considered result as failure.

Table 1 lists a few scoring systems in use, including ours. The largely applied Shorr's classification was actually designed for assessing blepharospam after treatment with botulinum toxin [1]. The Shanghai grading system gives appreciation of the quality of result [2]. The Japanese grading score associates the level of the eventual complications to the effect on spasm [3]. The questionnary on quality of life helps the patient to estimate the efficacy

* Corresponding author.
E-mail address: philippe.mercier@univ-angers.fr (P. Mercier).

https://doi.org/10.1016/j.neuchi.2018.01.001
0028-3770/

Table 1
MDV for HFS: scoring systems for outcome.

Classification of Shorr et al. (for blepharospasm treated with botulinum toxin) [1]
A = complete recovery: complete disapperance of spasms
B = partial recovery: as observed within half a year after surgery
C = no relief: evaluated after one year of follow-up
D = recurrence: when symptoms of spasms appear again after the disappearance of those, and no improvement one year after treatment

Shanghai grading [2]
Excellent: symptoms of HFS totally disappeared, and patient subjectively very satisfied with no auxiliary drug needed
Good: symptoms almost disappeared, but occasionally reappearing when the patient is stressed or making certain facial movements. However patient satisfied
Fair: symptoms partly relieved, but still frequent. Patient not satisfied
Poor: symptoms remain unchanged or even worse. Patient invalid
NB: The higher two grades correspond to "effective" result

Japanese grading [3]

Efficacy of surgery (E)	Complications (C)	Total evaluation of the result (T) (T is determined as the sum of the E and C grades)
E-0: Complete disappearance	C-0: No deficits, or only subjective complaints	T-0: excellent
E-1: Occasional slight spasm	C-1: Slight cranial nerve or cerebellar dysfunction not borthersome for daily life	T-1: good
E-2: Moderate spam	C-2: Both subjective and objective cranial nerve or cerebellar dysfunction problematic for daily life	T-2: fair
E-3: Not cured		T-3 to T-5: poor

Questionnaire on quality of life [4,5]
Items
Driving
Reading
Watching TV
Feel depressed
Avoid others' contact
Feel embarassed by the disease
Embarassed by others' reaction
Sleep impairment
Degree of disability
From no disability (0) to complete disablity (4)
0 = normal
1 = slight disability
2 = modeste disability, no functional impairment
3 = modeste disability, functional impairment
4 = severe incapacity

Personal classification
Score (Grade) 0 = total relief; patient fully satisfied
Score (Grade) 1 = subtotal relief: only occasional and mild twitches under stressing situations (not disabling); patient satisfied
Score (Grade) 2 = partial relief: between 90% and 50% improvement (disabling); patient not-satisfied
Score (Grade) 3 = failure: no effect or effect less than 50% (very disabling); patient regrets surgery
0–1: surgery effective; patient satisfied
2–3: surgery ineffective; patient not-satisfied

of the treatment thanks to 7 items [4] or 8 items, the last one being "sleep impairment" [5]. Our (simple) personal classification combines effect on spasm and patient's satisfaction.

For this chapter on outcome and complications, we have conducted a review of the literature published in English. Titles and abstracts were screened on the basis of the Pubmed system using the following keywords: microvascular decompression, neurovascular conflicts, facial nerve and hemifacial spasm. Full texts were retrieved according to contents of the abstracts, i.e., those with enough details and precisions to be analyzed. Series selected are listed in the various tables of the chapter.

2. Global effect on spasm

Long-term effect of MVD on spasm was first reported by Barker et al. who have done a statistical analysis of Jannetta's series that included 612 patients followed over a one-to-twenty-year period (mean: 8 years). Kaplan–Meier analysis showed that in those patients without prior MVD, 84% had probability of having an excellent result (i.e. total relief) at 10 years [6]. Recurrence rate was low: 1.5%.

In the Report of the Société de neurochirurgie de langue française by Sindou and Keravel, in 2009, review of the literature published between 1982 and 2008 showed that effectiveness of MVD – the first one if repeated – ranged from 65%–100% according to authors [7]. The term effectiveness regrouped the excellent and the good results, in other words the patients not anymore bothered by their twitches. In the majority of series, rates were in the range of 85%–90%. The phenomenon of delayed cure was mentioned in a number of publications but was diversely estimated as regard to the duration of delay. In all publications recurrence was rare, no more than 1%–2%.

The systematic review of literature by Miller and Miller, published in 2012, brings solid informations on safety and effectiveness of MVD for the treatment of HFS [8]. The reviewers collected 22 papers, exclusively from English-language, published between January 2000 and December 2010, and representing 5685 patients all together [9–30]. Follow-up ranged from 1–9.6 years with a median of 2.9 years. According to this review, complete resolution of spasm was obtained in 91.1% of the patients, notably delayed in 11.2%. Recurrence rate was 2.4%. Surgery was repeated in 1.2%.

For the present report, we carried out a complementary literature review, from years 2010 to mid-2017; it includes ten additional papers and seven unpublished series, which totalizes 5.935 more patients [5,17,31–38]. In most series follow-up was > 2 years. Rates of total relief ranged from 68% to 94.1%, with for most series a range between 85% and 90%. Recurrence rate was low,in the order of 1%. Incomplete resolution, i.e., more than or equal to 50% relief, ranged from 4.6%–19% and failure, i.e., effect less than 50%, from 3.6%–15.5%, according to series.

All the figures on spasm-relief – including the ones of the authors – are listed in Table 2.

3. Delayed cure

Not all of the patients are cured immediately after surgery. Numbers of patients may experience a delayed relief as pointed out in many publications [32,38–49].

Percentages of patients with delayed relief were very variable from one series to another, ranging from 5% [50] to 50% [18]. In most series as in ours', relief was delayed in one third of the patients (33% ± 8%).

Among reports in which delays were detailed, the following figures are given for illustration. In Li's 545 patient series, 41 (7.4%) had remaining spasms after surgery, of whom 33 had resolution in less than one year [24]. At the other extreme, Ishikawa et al. observed a delayed cure in half of their 175 patient series; delay was within one week in 25%, one month in 50% and eight months in 90% [18]. In Sindou's publication of 147 patients followed from one to twenty years (seven years on average) complete relief of the spasm was delayed in one-third of the patients [43]. Delay was less than six months in 50%, between six months and one year in 38% and after more than one year in 12%, of whom up to three years and half in two patients.

Because of the frequent occurrence of a delay lasting one year from surgery, reoperation should not be recommended before at least one year of F.U. For the patients with a tendency to gradually

Please cite this article in press as: Sindou M, Mercier P. Microvascular decompression for hemifacial spasm: Outcome on spasm and complications. A review. Neurochirurgie (2017), https://doi.org/10.1016/j.neuchi.2018.01.001