

SURGICAL OUTCOME OF MICROVASCULAR DECOMPRESSION FOR HEMIFACIAL SPASM

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ABSTRACT

Objective: To determine the surgical outcome of Microvascular decompression for hemifacial spasm in terms of symptomatic improvement.

Material & Methods: This Prospective observational study was conducted at the department of Neurosurgery, Lady Reading Hospital Peshawar, from July, 2014 to June, 2017. A total of 10 patients who underwent Microvascular decompression for hemifacial spasm and fulfilled the inclusion criteria were included in the study. Strict exclusion criteria were followed to avoid bias in the study. Per-operative findings were noted. Post-operatively the patients were examined for symptomatic improvement at the time of discharge and at 6 months follow up. The results were assessed with hemifacial spasm outcome scale. Any post-op complications were noted. SPSS version 22 was used for statistical analysis.

Results: Out of total 10 patients, 6 (60%) were females and 4 (40%) were males. The mean age was 42.80 ± 9.06 years, with a range of 28-55 years. The duration of preoperative symptoms ranged from 2 to 7 years with a mean of 3.9 years. Right side was involved in half (50%) of the cases. Per-operatively, the offending vessel was anterior inferior cerebellar artery (AICA) in 7 patients. Post-operatively 6 patients (60%) had excellent, 2(20%) patients had good and 2(20%) patients had poor outcome. At 6month follow up 8 (80%) patients had excellent, 1 (10%) patient had good and 1 (10%) patient had poor outcome. Post-operatively 2 (20%) patients developed hearing loss and one (10%) patient developed facial nerve palsy. At 6 months follow up only one (10%) patient had persistent hearing loss, while the other two patients improved clinically.

Conclusion: Microvascular decompression is an effective procedure for hemifacial spasm with acceptable rate of complications.

Keywords: Hemifacial Spasm, Microvascular decompression surgery, Treatment outcome.

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INTRODUCTION

Hemifacial is a clinical disorder characterized by involuntary, painless, spasmodic contractions of the facial muscles on one side of the face innervated by the ipsilateral facial nerve.¹ In typical cases, it usually starts from orbicularis oculi and spreads downward to involve the lower face.² The annual incidence is approximately 1/100,000 and prevalence is 10/100,000, with a slight

female predominance.^{3,4,5} Typically, the patients are affected in the 5th or 6th decade of life, but presentation early in 3rd and late in the 7th decade is also reported.² The presentation of hemifacial in pediatric age group is very rare and mentioned in a case report.⁶ The Hemifacial spasm is problematic for the patient because it is socially embarrassing and in severe cases, can impair the routine activities of the patient, like public dealing and driving etc.⁷

Hemifacial spasm is classified as primary or secondary. Primary Hemifacial spasm is due to neurovascular compression at the level of root exit zone and secondary Hemifacial spasm occurs because of the damage of the facial nerve anywhere along its course.⁸

As the study of the natural history of these patients reveals that very few of them have spontaneous

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resolutions of the symptoms, most of them will require one or another form of treatment during the course time of their disease.⁷ Various studies show the failure of medical treatment in this regard.⁷ Though some of the studies are supporting the usage of botulinum toxin as a treatment options, but it can be associated with adverse events like ptosis, tearing, diplopia and blurring of vision etc.⁹ Microvascular decompression for Hemifacial spasm was first introduced by Gardner and Sava and later popularized by Jannetta, has now become a procedure of choice for the treatment of Hemifacial spasm, with more than 90% success rate.¹⁰⁻¹³

The rationale of the study is that there is no regional study available on this topic, so this study will help us in generating data of our own population and will let us determine the efficacy and safety profile of the procedure in our population.

MATERIAL & METHODS

This prospective observational study was conducted at the department of Neurosurgery, Lady reading hospital, Peshawar, in a period of 3 years i.e. from 1st July, 2014 to 30th June, 2017. Patients admitted through OPD, with the diagnosis of Hemifacial spasm were included in the study using non-probability consecutive sampling technique. Both genders of ages from 30-70 years, Patients with primary hemifacial spasm were included in the study while those patients who presented with Secondary hemifacial spasm, Recurrent cases of hemifacial spasm, Hemifacial spasm with associated trigeminal neuralgia, Hemifacial spasm previously treated with Botulinum toxin were excluded from the study.

All the patients underwent pre-operative MRI brain to look for the offending vessel and to exclude cases of secondary Hemifacial spasm. Then the patients were subjected to retro-sigmoid sub-occipital craniotomy and intraoperative findings were noted. Any vessel responsible for the compression was noted.

Post-operatively the patients were examined for symptomatic improvement at the time of discharge and at 6 months follow up. The following outcome success score was used for assessment

1. Excellent (complete remission, defined as 2 muscle spasms per week)
2. Good (1-2 spasms/day, with remarkable improvement from preoperative status)
3. Poor (> 2 spasms/day, with slight or no improvement from preoperative status)
4. Recurrence (relapse after initial excellent or good response)¹³

Any complications during the post-operative pe-

riod were recorded and re-assessed at the follow up as well. The data was collected with the help of a questionnaire, including demographics, duration of symptoms, side involved, intraoperative findings, clinical outcome and complications. Mean and standard deviation was calculated for quantitative variables like age. Frequency and percentages were calculated for qualitative variables like, gender, intraoperative pathology, surgical outcome and post-op complications. SPSS version 22 was used for statistical analysis.

RESULTS

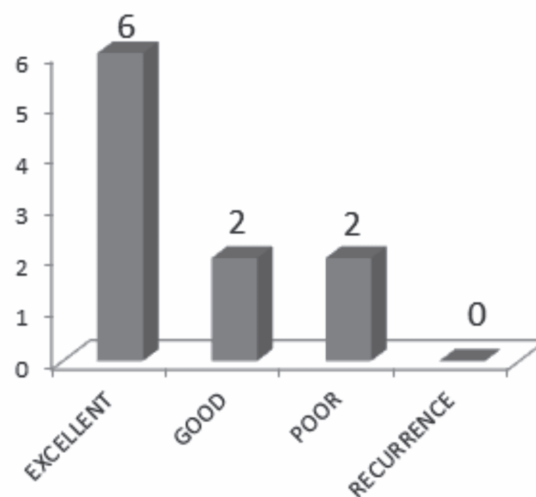
The total no. of patients were 10, out of which 6 (60%) were females and 4 (40%) were males, with a male to female ratio of 1:1.5. The age of the patients ranged from 28 to 55 years, with a mean age of 42.80 ± 9.06 years. The duration of preoperative symptoms ranged from 2 to 7 years, with a mean duration of 3.9 years. Out of 10 patients, half of them presented with right sided symptoms. Intra-operatively, the following vessels were found responsible for the pathology, as shown in table 1.

The clinical outcome assessed by the scale mentioned above in the post-operative period at the time of discharge and at 6 month follow up was as shown in graph 1 and graph 2 respectively..

The following complications were noted post-operatively as shown in table 2.

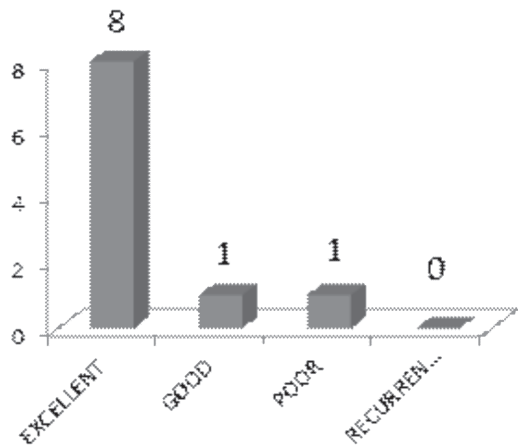
DISCUSSION

Hemifacial spasm is a clinical entity and can be very bothersome for the patients. The natural history of the patients reveals that very few of them have spontaneous resolution of symptoms and most of them will require one or another form of treatment.⁷ Microvascular decompression is a procedure of choice for hemifacial



Graph 1: at the time of discharge

Surgical outcome of microvascular decompression for hemifacial spasm



Graph 2: at 6 month follow up

Table 1: intraoperative findings

Offending vessel	No. of patients
AICA	7
PICA	1
Arachnoid Adhesions	2

Table 2: Complications

Complications	No. of patients
Transient hearing loss	2
Transient facial nerve palsy	1
Permanent hearing loss	1

spasm, with its efficacy varying from 92 to 97%.¹⁴ With the advancement of technique of microvascular decompression, it is now generally accepted that patients who fail or stop to respond to botulinum toxin, should be treated with microvascular decompression or even it can be utilized as a first line management option. We conducted this study to evaluate the surgical outcome of microvascular decompression for hemifacial spasm and to look for any associated complications.

In our study we found that, the mean age of the patients presenting to us was 43 years, which was almost similar as reported in the literature, in which the mean age ranged from 44-62 years.¹⁵ There was a slight female predominance observed in our study, which is also seen elsewhere in the literature search.¹⁶ The reason why females are more affected than males cannot be said with certainty, though it is a persistent findings in almost every study. In our study, we did not encounter any case which was associated with familial history of hemifacial spasm. Familial cases of hemifacial spasm are associated with early presentation of the patients in the twenties or thirties.¹⁷

In our study the number of patients affected on

the right and left side were equal, similar to those of Illingworth et al and lee et al.^{5,7} while in a few other studies the left side was affected more than the right side.^{14,16}

We found that, intra-operatively, AICA was responsible for 70% cases of neurovascular conflict followed by arachnoid adhesions (20%) and PICA in 10% of cases. We did not encounter any case having vertebral artery as a culprit vessel responsible for the symptoms. AICA was the most common vessel found in other studies as well.¹⁷ While few others reported PICA as the most common culprit vessel.¹⁸

Post-operatively, at 6 month follow up, 90% of the patient had satisfactory results (excellent and good), while only 1 (10%) patient had a poor outcome, with no clinical improvement. At the follow up period, no recurrence was reported in those patients who were symptoms free at the time of discharge. The success rate in our study is comparable to other studies in which the success rate ranged from 82% to 92%. Shibahashi et al reported the highest success rate of 97%.¹⁷ Hameed et al. reported that 60% of the patients had immediate relief, while 30% of the patients improved in the next six weeks.¹⁸

During the follow up period of 6 months, two patients turned into the excellent recovery category from good category and 1 patient from poor category turned into good category which signifies this point that it might take some time for the microvascular decompression to become effective. Therefore, it was suggested that the minimum period for follow up should not be less than 3 months and can be followed up to one year, 15 though in our study the follow up period was 6 months.

In our study in only one (10%) patient had a permanent hearing loss on the side of operation, while 2 patients had temporary hearing loss and 1 patient had temporary facial nerve palsy, which resolved at the time of follow up. Complications rate varied from 19% to 43% in various studies.^{19,20} The hearing loss and facial nerve palsy was observed because of the close proximity of the two nerves to each other in the intracranial cavity and during the manipulation of the facial nerve, there was some damage to the cochlear nerve. Most of the time this damage was temporary and resolved spontaneously with conservative approach but one patient ended up with permanent hearing loss.

CONCLUSION

Microvascular decompression is an effective procedure for hemifacial spasm, with minimal rate of complications and can safely be recommended for the general population.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

Ahmad S: Data Collection.

Azam F: Main Idea

Hussai N: Bibliography

Ali M: Overall Supervision.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.