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Research Article

Clinical outcome following micro-vascular decompression for trigeminal neuralgia

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ABSTRACT

Background: Trigeminal neuralgia is the most common facial pain syndrome characterized by severe, brief recurrent episodes of electric shock like pain in the distribution of one or more branches of trigeminal nerve on one side of the face. In the present paper we present our experience with MVD for trigeminal neuralgia in a series of 20 patients during the last 4 years.
Methods: All the patients presented to the neurosurgery department with features suggestive of Trigeminal Neuralgia during the last 4 years were evaluated with 3D FIESTA imaging. All those patients eligible for surgical decompression underwent a standard MVD in the form of a small retromastoid suboccipital craniotomy and Microvascular decompression done using a sheet of Teflon to intervene between the vessel and the Vth nerve. Any arachnoid bands across the nerve were carefully divided. Standard post-operative care given. The results were evaluated and tabulated.
Results: 65% (N=13) of the patients had immediate postoperative relief. 15% (N=3) showed delayed but good pain relief in 3 weeks period. 20% (N=4) 20% pts did not show any pain relief at all post operatively. There were no mortalities in the series and no redo surgeries were performed in the series.
Conclusion: Micro-vascular decompression is safe and effective in producing good pain relief over a long term in patients with Trigeminal neuralgias refractive to medical treatment.

Keywords: Micro-vascular decompression, Trigeminal neuralgia, Neuro-vascular compression

INTRODUCTION

Trigeminal neuralgia is the most common facial pain syndrome characterized by severe, brief recurrent episodes of electric shock like pain in the distribution of one or more branches of trigeminal nerve on one side of the face.[1] The exact etiology is not known. It is thought to be due to a compression of the Vth nerve at the root entry zone by a vessel. In 1934, Dandy hypothesized for the first time that neuro vascular compression may be the cause for Trigeminal neuralgia. Gardner supported the hypothesis in 1962, and later Jannetta suggested MVD as surgical procedure for the treatment of trigeminal neuralgia.[1,2] It is common in the age group between 40-60 years of age. Currently medical treatment by Carbamazapine is the first line of treatment but they may fail in due course of time and at least 50% of cases require some sort of surgical ablative procedure for pain relief. Currently the MVD procedure is perceived as the most effective treatment for trigeminal neuralgia with satisfactory outcomes.[2,3]

METHODS

Our experience with a series of 20 pts who underwent Micro-vascular decompression for Trigeminal neuralgia in the last four years is presented.

Between February 2010 to January 2014, a total of 20 pts with typical facial pain suggestive of Trigeminal neuralgia were admitted to the Dept. of Neurosurgery .The diagnostic work-up included was documenting an accurate clinical history and MRI examination in all the cases. There were 9 males and 11 female patients in this study group. The age group was in the range of 40-60 years. The mean duration of the disease was 1-9 years. Clinically V2-V3 was involved in 12 patients and in 8 patients V1-V2 was involved. .None of the patients had all three branch involvement. MRI was taken for all the patients with FIESTA technique, revealed vascular compression in 13 cases (65%) (Figure 1) and no pathology in rest 7 cases (35%). All the patients had a failed medical history on drugs for a period ranging from 1 to 7 years. All patients underwent small retromastoid suboccipital craniotomy and Microvascular decompression done using a sheet of Teflon to intervene between the vessel and the Vth nerve (Figure 2). Any arachnoid bands across the nerve were carefully divided. There were arterial compression in 10 cases (50%), venous in 2 cases (10%) and combined artery and venous compression in one case in the CP angle cistern. In one case there were thick arachnoid band across the nerve which was cleared off the nerve. In cases where there was no pathological finding we gently stroked the nerve on either side and left over. The operative findings in all the cases were recorded and post-operative results were analyzed (Table 1).

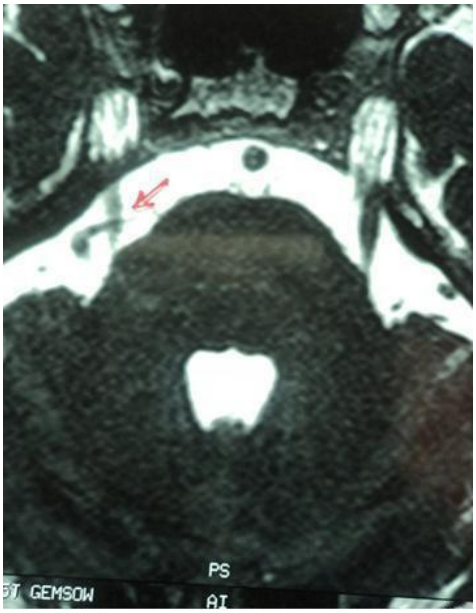

Figure 1: 3D FIESTA image showing compression of Right Vth CN by a vascular loop.

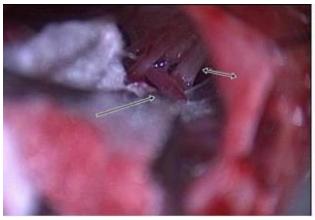

Figure 2: (a) Intra OP image showing posterior compression of Vth CN by a vessel.

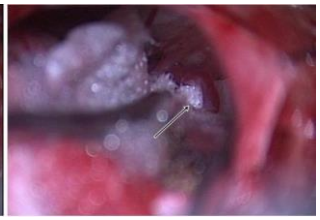

Figure 2: (b) Intra OP image showing a Teflon patch between Vth CN and vessel

Table 1: Base line characters of the patients included in the series.

Charectaristic	Value
Age at surgery	
Median	49 years
Range	32 – 70 years
Male sex	10 (52%)
Female sex	9 (48%)
Side of operation	
Left side of face	9 (48%)
Right side of the Face	10 (52%)
Bilateral	0
Age at onset of symptoms	
Median	45 Years
Range	25 – 65 years
Pre-operative Duration of symptoms	3.5 years
Median	8 Months to 7 years
Range	
Distribution of pain	
V1 only	0
V2 Only	11 (58%)
V3 only	1 (5%)
V1 and V2	0
V2 and V3	7 (37%)
V1, V2 and V3	0
Prior drug treatment	
Carbamazpine	11 (58%)
Phenytoin	3 (16%)
Baclofen	0
Preoperative Facial Numbness	
Hyposthesia	2 (11%)
Hyperalgesia	0

There were no mortalities in this series. Four patients had CSF leak which improved in due course of time with conservative treatment. One patient developed decreased hearing post-operatively and one patient developed facial parasthesias on the side of operation.

Outcome criteria and follow-up results

The individual patient clinical data, operative findings and complications were recorded. The immediate post-operative results were graded as excellent, (>90% immediate pain relief), good (> 75% pain relief), or poor or failure (25% or less pain relief) during the first week of surgery. All the pts were followed up for a period ranging from 12 to 40months (mean follow-up 24 m). All the patients were asked to grade their residual pain compared to their pre-operative pain status.

RESULTS

There was immediate pain relief in 14 (70%) patients. 13 patients showed excellent pain relief immediately following surgery and there is no recurrence of pain till the last follow-up. Only one patient showed early recurrence within 8months following surgery. This patient had a venous compression and was a female

patient. 3 (15%) patients in this series showed a delayed but good pain relief in 3 weeks period. 4 (20%) pts did not show any pain relief at all post operatively. Among this group one patient had compression by multiple small vessels both arterial and venous in a female and another patient in this group did not have any neural compression pre-operatively. 2 patients did show some amount of pain relief immediately but recurred in 6 months duration to pre-operative status and are again continuing medication. We did not plan any reoperation for these patients as there was no pre-op neural compression in these patients.

DISCUSSION

Trigeminal neuralgia is a common facial pain syndrome characterized by recurrent episodes of brief electric shock like pain in one or more distributions of the trigeminal nerve.[1,5] The etiology of the condition is still not clear but compression of the nerve in the CP angle cistern at its exit point from the brainstem by a vessel is considered to be the most popular explanation offered as the pathophysiology of the condition.[6,7] Other causes include demyelination in the nerve at REZ zone, compression by tumour like Epidermoids and sometimes etiology is unknown. It is common in the age group of 40-60 yrs, with slight predilection for female sex. Treatment generally begins with carbamazapine which frequently gives relief but may fail in due course of times in at least 50% of cases and may require surgical interventions in the form of percutaneous ablative procedures or Micro-vascular decompression. Currently percutaneous radiofrequency thermocoagulation, stereotactic radiosurgery and percutaneous microbaloon compression are the common ablative therapies in elderly patients and in cases which doesn't merit Micro-vascular decompression. These procedures have not gained much popularity because of the short term benefit and potential risks involved with the above procedures.

In the earlier years, Jannetta strongly supported the hypothesis of Microvascular decompression and perfected and popularized the MVD operation for the treatment of Trigeminal neuralgia[8]. Thereafter, Barker et al., emphasized MVD by demonstrating a 70% cure rate in a 10 year follow-up study[4]. Pain relief by MVD is higher (80%) in patients with typical Trigeminal neuralgia than in patients with atypical Trigeminal neuralgia (56%). Probably this may be the most important prognostic factor in MVD.[8,9] We also noticed similar results in our series, (70%) patients showing immediate pain relief in typical cases at the end of 3 year follow-up.

MVD as a surgical approach may offer certain advantages. It carries a very low risk of facial paresthesias or anesthesia in the post-operative period compared to other ablative procedures.[10,11] and the benefits of MVD are more long lasting, hence more appropriate for young individuals than elderly.

Recurrence or failure of MVD

Four factors have been identified for recurrence following MVD. They are symptoms lasting for more than 8 years, neural compression by a vein rather than an artery or multiple compression by small vessels, female gender and elderly patients with probable long standing demyelination changes at root entryzone.[11] We also noticed similar findings in this present series. Also lack of immediate pain relief indicates poor long term outcomes following MVD. We also noticed a 10% recurrence within 1yr following MVD. Minimizing trauma to the nerve by careful handling of the nerve during surgery seems to be the essential component to maintain normal function of trigeminal nerve and also to reduce the risk of recurrence.[12] Various studies have shown that of all the currently available surgical methods MVD offers highest rate of long term satisfaction with lowest chance of recurrence.

CONCLUSION

In conclusion we have found Micro-vascular decompression is safe and effective in producing good pain relief over a long term in patients with Trigeminal neuralgias refractive to medical treatment.

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