

# IMMINENT PATHOLOGY IN MICROVASCULAR DECOMPRESSION FOR IDIOPATHIC TRIGEMINAL NEURALGIA

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## ABSTRACT

**Objective:** To know about the impending pathology in microvascular decompression for idiopathic trigeminal neuralgia.

**Methodology:** This was a prospective observational study conducted in the Department of Neurosurgery, Lady Reading Hospital Peshawar, from 20<sup>th</sup> August 2012 to 25<sup>th</sup> August 2013. The clinical and the operative records of the patients were noted and demographics such as the age, sex, side of the lesion as well as the per-operative impending pathology i.e. compression by an artery, vein or distortion by adhesions or a combination of them compressing upon the trigeminal nerve root was recorded on a predesigned proforma. All patients undergoing surgery for idiopathic trigeminal Neuralgia were included in the study. Patients who had trigeminal neuralgia secondary to a mass lesion were excluded from the study. The data was expressed in percentages and was analyzed through SPSS version 16.

**Results:** Total of 55 patients in the study period fulfilled the criteria. There were 28 males and 27 females with a male to female ratio approaching 1:1. The age range was from 28 to 73 years with a mean age of 54.6 years. In 56.4% the pathology was right sided and in 34.5% it was left sided while in 9.1% it was bilateral (operated unilateral at the time). The impending pathology was compression by an artery in 76.6%, by a vein in 21.6% or purely by adhesions in 1.6% of cases.

**Conclusion:** compression by an artery is the most common pathology encountered in the microvascular decompression for trigeminal neuralgia.

**Key Words:** Trigeminal neuralgia, Microvascular decompression

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## INTRODUCTION

Typical trigeminal (tic douloureux) is a condition of severe, short, stabbing, superficial and recurrent pain in the distribution of one or more divisions of the trigeminal nerve first reported by John Fothergill in 1773<sup>1,2</sup>. Since then various modalities have been adopted for treating the problem. The condition is very annoying for the patient and he is coerced to regularly use the atypical analgesics<sup>3</sup>. Microvascular decompression is among the many treatment options to choose from like blocking the trigger point with alcohol local blocks, blocking of the nerve branches by neurectomy, percutaneous rhizotomy of the trigeminal ganglion, radiosurgery<sup>4-6</sup>. First recognized as a surgical entity by Dandy in 1934<sup>3</sup> through microvascular decompression (MVD) of the dorsal root entry zone. Peter Jannetta popularized the procedure (1967)<sup>4</sup> and since then has been considered as the gold standard for the treatment of intractable trigeminal neuralgia after failure of the medical treatment<sup>7,8</sup>. Almost fifty percent of patients will be unre-

sponsive to medications or would be having stigmata of overdosing<sup>9,10</sup>. This is very important from a neurosurgical vantage point. The imminent pathology in the MVD responsible for the problem has been compression by an artery usually a Superior Cerebellar Artery (SCA) or loop of Anterior Inferior Cerebellar artery (AICA), venous pathology implicated as a cause been reported in some series as high as 80-90% especially in the recurrent conditions and in the younger age group<sup>5-8</sup>. This has been the sole incentive to carry out an audit of the patients with trigeminal neuralgia treated through MVD at our institution and to know about the impending pathology encountered during the procedure.

## METHODOLOGY

This was a prospective observational study conducted in the Department of Neurosurgery, Lady Reading Hospital Peshawar, from 20<sup>th</sup> August 2012 to 25<sup>th</sup> August 2013. The clinical and the operative records of the patients were checked and demographics such as the

age, sex, side of the lesion as well as the per-operative impending pathology i.e. compression by an artery, vein or distortion by adhesions or a combination of them compressing upon the trigeminal nerve root was recorded on a predesigned proforma. All patients undergoing surgery for idiopathic trigeminal Neuralgia were included in the study. All the patients were operated through a retromastoid suboccipital approach by a single surgeon under the microscope who has been doing the procedure since last ten years. Patients who had trigeminal neuralgia secondary to mass lesion were excluded from the study like dermoid, epidermoid, trigeminal schwannoma and meningioma in the cerebellopontine angle. The data was analysed through the SPSS version 16.

## RESULTS

A total of 55 patients in the study period fulfilled the criteria. There were 28 males and 27 females with a male to female ratio approaching 1:1. The age range was from 28 to 73 years with a mean age of 54.6 years. The age was further grouped into five and the distribution of patients among different age group is given in table 1. The most common group was the patients with

the age range in 40-50 years comprising approximately 50% of the total. And the patients with the age range 40-60 years constituted 70% of the total.

In 56.4% the pathology was right sided and in 34.5% it was left sided while in 9.1% it was bilateral (operated unilateral at the time).

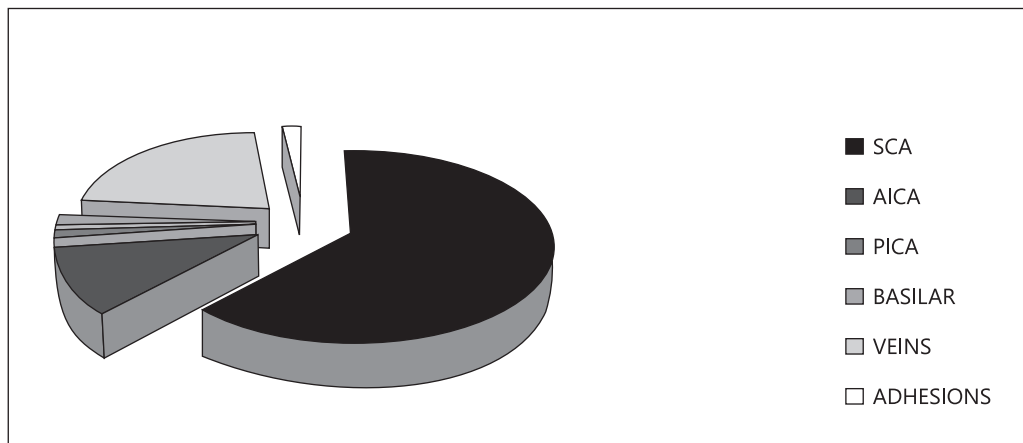
The impending pathology was compression by an artery in 76.6% either by the Superior Cerebellar Artery(SCA), Anterior Inferior Cerebellar Artery(AICA), posterior Inferior Cerebellar artery(PICA), Basilar artery or an artery in synergy with arachnoid adhesions. Compression by a vein was in 21.6% or purely by adhesions in 1.6% of cases. In a few cases adhesions were observed along with the vascular compression.

Further considering the etiology on the gender wise the most common pathology in males was the compression by SCA alone(20/32 patients) while venous compression was more common in females(10/12 patients). The age wise more common pathology in the younger age group were the veins while in the older age group it was the.

**Table 1: Age of the sample**

| Age range(years) | No. of patients | Percent |
|------------------|-----------------|---------|
| 20-30            | 3               | 5.5     |
| 31-40            | 9               | 16.4    |
| 41-50            | 27              | 49.1    |
| 51-60            | 12              | 21.8    |
| 61 and above     | 4               | 7.3     |
| Total            | 55              | 100.0   |

**Figure 1: Proportion of impending pathology**



## DISCUSSION

Microvascular decompression has been the procedure of choice for patients with intractable trigeminal neuralgia refractory to the usual dosages of the commonly used drugs for the problem<sup>4,5,8</sup>. The etiology of the trigeminal neuralgia has been the compression of the trigeminal nerve by loop of an artery, a vein or kinking of the nerve by adhesions at the dorsal root entry zone near its exit from the pons<sup>6-8</sup>. The nerve is freed of any adhesion with vessels and there is interposition of the Teflon mesh between the pathology and the nerve which is preferable, we use muscle patch in between the nerve and the vessel. In case of kinking of the nerve root; the nerve is freed from adhesions and at the end of the procedure the nerve should be straight. The trigeminal nerve should be inspected from all the side and there be no vascular loop in close contact with the nerve.

The disease is found to be more common in the elderly population and the mean age of the patient in our population was 48.5 years. The most common age group affected was the people between 40-50 years. This has been consistent with a study by Katusic et al<sup>11</sup> where the mean age was 54 years and the most common age group affected was 45 to 58 years.

The male to female ratio in our series is 1:1. Females are thought to be suffering more from the disorder because of the shallow posterior fossa and are less stoical to pain than males by and large that's why they opt for a definite remedy quite early<sup>12</sup>. Almost all the studies report the pathology to be higher among females endorsed by the shallowness of the posterior fossa in females<sup>12,13</sup>.

SCA as a cause of the condition has been implicated in 86 to 90%<sup>14,15</sup> of cases and in the previous article by the senior author this has been the culprit in more than 98% of cases. In the current series this has been a cause in the 58.2% of the cases. This was more common in males (21/34) cases compared to females. It was also more common in the age group 40-60 years also more a common pathology on the right side compared to the left.

Basilar arteries, PICA and AICA are the less common causes of compression at the DREZ. AICA in our series was the cause in a total of 6 patients and in 3 it was directly the cause while in 2 it was in association with the PICA and in one patient there were adhesions along with the impending AICA loop. AICA as a cause of trigeminal neuralgia is reported in the range of 4%<sup>15,16</sup> by the two local studies and had been reported as high as upto 14%.

The basilar artery is less frequently implicated as a cause due to the anatomical location. In our series it was present in 1 case. The reported incidence in litera-

ture has been from 2%<sup>9</sup> in most series. The highest reported have been 7.7%<sup>14</sup>. Compression by two vessels was seen in 3 patients and had been reported to be present in about 6-18% of cases.

The venous pathology implicated in the arena is quite low in the previous series by the senior author (Ali M). The veins in some series are reported to be the cause in about 5% to 60%<sup>9,15,17</sup>. Veins are most common in the recurrent cases. Venous pathology is important because recurrence rate is as high as 31%<sup>17</sup> neuralgias having compression by a vein as opposed to 1-2%<sup>16</sup> overall. The venous pathology is considered to be the cause in 80-90%<sup>17</sup> of the recurrent cases mostly due to the formation of new veins and bipolar should be avoided in the recurrent cases rather using Teflon mesh is recommended.

## CONCLUSION

Compression by an artery is the most common pathology encountered in the microvascular decompression for trigeminal neuralgia. Veins are recognized as a frequent cause of the problem in the new arena and are important for the management options as they are associated with an increase recurrence rate.

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### CONTRIBUTORS

RZ conceived the idea, planned the study and drafted the manuscript. BK and HMK helped acquisition of data and did statistical analysis. NU drafted and critically revised the manuscript. MA supervised the study. All authors contributed significantly to the submitted manuscript.