



Original Research Article

Introduction of MOLUMA'S Implant-An Innovation to permanent cure of Trigeminal neuralgia and several Neurovascular compression syndrome

Mayukh Pandit^{1,*}¹Dept. of Anatomy(Research), T.I.D.S.H.R.C, Bilaspur, Chattisgarh, India

ARTICLE INFO

Article history:

Received 08-05-2020

Accepted 26-05-2020

Available online 20-07-2020

Keywords:

Neurovascular

Syndromes

Anticonvulsan.

ABSTRACT

Brain is the most complex organ in vertebrate's body. This complexity is operated and regulated by different cranial structures present in it. The complexity of relaying information between the brain and different parts of body primarily to and from regions of head and neck including special senses of vision, taste, sense and hearing is conducted by a 12 pair of nerve that emerges directly from the brain known as Cranial Nerves. Sometimes compression on this nerves caused due to vascular structure would lead to develop a serious vascular compression disorder known as Neurovascular compression syndrome. There are several forms of neurovascular decompression syndromes known out of which my article focused on the prominent one, which have no permanent cure of pain relief. I am also introducing my surgical implant named as MOLUMA'S surgical implant which could be an innovation in the field of neurosurgery which could be a cure for several forms of neurovascular compression syndromes and make the patients who are suffering pain free for the rest of their lives.

© 2020 Published by Innovative Publication. This is an open access article under the CC BY-NC license (<https://creativecommons.org/licenses/by-nc/4.0/>)

1. Introduction

Neurovascular compression syndromes could be defined as a form of vascular compression disorder where there is usually a compression of cranial nerves due to aberrant vascular structures.¹ According to American Journal of Neuroradiology, neurovascular compression syndrome are usually caused by arteries that directly contact the cisternal portion of a cranial nerve. There are several forms of neurovascular compression syndrome, out of which prominent ones are Trigeminal neuralgia, Glossopharyngeal neuralgia, Geniculate neuralgia and Hemifacial spasm. Trigeminal neuralgia is a paroxysmal attack of pain lasting from few hours to several days and confined to distribution of one or more division of trigeminal nerve. Anticonvulsant medication are used, out of which Carbamazepine is considered as the drug of choice for trigeminal neuralgia. It relieves pain for very short period of time. There are several surgical procedures

known which relieves pain but not for permanent period of time. Out of which Microvascular decompression surgery is the only surgical procedures known which could cure trigeminal neuralgia for a longer period of time. Microvascular decompression surgery is a surgical procedure which relieves abnormal compression of cranial nerves causing trigeminal neuralgia, glossopharyngeal neuralgia, geniculate neuralgia and hemifacial spasm and several forms of neurovascular compression syndromes. But in recent times some very serious complication of MVD have been widely reported across the globe. This made me focus and work on this critical disorders and find a cure for permanent pain relief with minimal or null complications. So thereby I propose my surgical hypothesis which I named as MOLUMA'S surgical hypothesis, an innovation in the field of neurosurgery which could cure several forms of neurovascular compression syndrome with an achievement of permanent pain relief.

* Corresponding author.

E-mail address: mayukhpandit17@gmail.com (M. Pandit).

2. Materials and Methods

Microvascular decompression surgery is the only surgery known which could relieve pain by separation of abnormal compression caused due to offention of vascular structure to be cranial nerves. In Trigeminal neuralgia, vessels which have been offending the Trigeminal nerve is Superior cerebellar artery or in very rare case Anterior inferior cerebellar artery. Sometimes it has been observed that veins could also contribute to compression. The main objective of MVD is separation of Superior cerebellar artery with Trigeminal nerve by placement of 'TEFLON' sponge. Teflon sponge isolate the nerves from pulsating effect & pressures of blood vessels.

Craniotomy is the first surgical approach in microvascular decompression surgery, where 3 inch of curved skin incision is made in the mastoid region, just behind the ear. With the application of drill one inch opening should be made in the occipital bone. Dura would be exposed after the previous stage. The dura would have to be opened properly with surgical scissors and with the application of retractors it have to be folded back to expose the brain properly.

This would give the surgeon a proper exposure of 5th cranial nerve as it originates with the brain stem. Then identification of offending vessels causing the compression is made by the following surgeon. There are often some connective tissue which might be present in between the vessels and nerve must be dissected free. Then placement of shredded Teflon is made in between the vessels and nerve. There are some cases observed where Superior Petrosal vein found adherent to nerve also causes the compression, must be cauterized. After the successful placement of Teflon, retractors should be removed. The brain would regain it's neutral position. The dura should be closed with sutures and must be made watertight with tissue sealants. Since the opening is very small, instead of replacement, a titanium plate is placed with screws which covers the opening. The muscle and skin are sutured back together. A soft adhesive dressing must be placed over the incision.²

Microvascular decompression is the only surgical procedure known which could cure several form of neurovascular compression syndrome and has a highest pain relief period as compared to different surgical procedures which are cleaning curly known. But microvascular decompression surgery have been reported in various places where serious complications have been oobserved. There are very serious complications of microvascular decompression widely reported for Trigeminal neuralgia and hemifacial spasm, which are Intracerebellar hematoma with acute hydrocephalus, supratentorial acute subdural hematoma, status epilepticus, infection of brain stem, subarachnoid hemorrhage due to traumatic aneurysm and infarction in territory of posterior cerebellar artery.³ The most common complications which are usually reported related to Microvascular decompression surgery is nerve damage

which further includes hearing loss, double vision, facial paralysis, dysphagia and spinal fluid leakage.

MVD known to last 10 - 20 years with a possible recurring rate of 10%.⁴ Teflon could be one of the major cause of recurrence. In some cases it also have been reported that after 5 to 10 years due to excessive amount of Teflon used resulted in a condition commonly known as Teflon Granuloma.

Teflon Granuloma is an inflammatory giant cell foreign body reaction to polytetrafluoroethylene fibers.⁵ Teflon Granuloma clinically, pathologically and radiographically could emulate malignancy. Adverse reaction from Teflon have been reported which includes frontalis muscle suspension in TMJ surgery, pericardial closure in rheumatic heart surgery.⁵ There was a research conducted by Chen J Sin where he reported five cases of Teflon Granuloma after MVD for Trigeminal neuralgia. Operative finding were 10 patients with recurrence where Teflon Granuloma in five patients, arterial loop in 3 patients, venous compression in 1 patients and negative exploration in 1 patients. The patient even complained of facial numbness after there 1st MVD operation.⁴

The most possible cause of Teflon Granuloma is direct contact of Teflon with Tentorium. Histological finding of Teflon injection in animal larynges suggest that Teflon causes inflammatory response in human could be the cause of elevated WBC count, papilloedema and increased intracranial pressure.^{5,6}

With such serious complications of micro vascular decompression surgery and critical clinical and pathological findings of Teflon application it demands the better alternative.

So herby I am showcasing my invention of MOLUMA'S surgical implant which could be a permanent cure for several forms of neurovascular compression syndrome such as glossopharyngeal neuralgia, geniculate neuralgia, and hemifacial spasm apart from trigeminal neuralgia. MOLUMA'S surgical implant works on by separating the offending nerve from the vascular structure causing the compression permanently. According to an article written by Dr. Aqueel in Neurosurgical Atlas which states that MVD with the application of Teflon could last 10-20 years with a possible recurrence. Whereas MOLUMA'S surgical procedure could cure any form of neurovascular compression syndrome with an achievement of permanent pain relief. There are minimal chances of recurrence of symptoms in MOLUMA'S surgical procedure which uses its advanced and biocompatible surgical implants. In case of Trigeminal neuralgia, which usually arises from compression by superior cerebellar artery to the fifth cranial nerve, MOLUMA'S surgical implant is placed in between the offending vessels and the fifth cranial nerve. This placement would ensure the separation for a permanent period of time and will resist any form

of displacement unlike Teflon. This would also ensure proper protection of surrounding anatomical structures. Application of MOLUMA'S surgical implant would ensure proper cure of Trigeminal neuralgia forever with minimal chances of recurrence.

John Nottingham was first to describe geniculate neuralgia as a condition where the vascular compression occurs in nervous intermedius by anterior inferior cerebellar artery. This rare condition give rise to severe unilateral peri-auricular pain which is very sharp and often described as an 'ice prick in the ear'.⁷ MOLUMA'S surgical implant would have to be placed between the nervous intermediate and the blood vessel which is causing the compression. This would ensure the prevention of any form of recurrence and will resist displacement. MOLUMA'S surgical procedure will be able to cure geniculate neuralgia and will be able to provide permanent pain relief.

Glossopharyngeal neuralgia also known by the name as Eagle's syndrome condition which cause stabbing pain in the throat area, the back of the tongue or the middle ear.⁸ Trauma due to an injury are surgical procedures, infectious tumors and vascular abnormalities could be the causes of glossopharyngeal neuralgia. But the main clinical cause is a compression observed between the glossopharyngeal nerve and blood vessel when they exit the brainstem. MOLUMA'S surgical procedure with the application of MOLUMA'S implant could cure any form of neurovascular compression syndromes with the permanent pain relief period. Glossopharyngeal neuralgia could also be cured permanently with minimal complications done with MOLUMA'S surgical procedure. Placement of MOLUMA'S implant between the glossopharyngeal nerve and the blood vessel when it exits the brainstem would ensure the proper separation. Here also there would be very less chances of recurrence.

Hemifacial spasm also known 'Tic convulsif' is an involuntary contraction of facial muscle which are controlled by facial nerve one which origin at the brain stem and gets offended by Anterior inferior cerebellar artery due to tumor or injury or in some cases Bell's palsy.[10] MOLUMA'S implant would be able to provide permanent pain relief by separating the offending vessels to nerve by its placement in between the anterior inferior cerebellar artery and facial nerve. Hemifacial spasm could be corrected with MOLUMA'S surgical implant with null complications and minimal chance of recurrence.

The possible complications of my surgical hypothesis could be seizures, cerebrospinal fluid leakage and facial numbness at critical condition. There will be very less chances of infection as MOLUMA'S surgical implant would

bean 'Antibiotic Impregnated surgical implant'.

3. Conclusions

There are several other forms of neurovascular compression syndromes known out of which my paper focused on the most prominent ones which have no permanent cure for pain relief. My proposed surgical hypothesis MOLUMA'S surgical procedure will be a modern innovation in the field of neurosurgery. MOLUMA'S surgical procedure will always aim at curing any form of neurovascular compression syndrome with null or minimal complications, so that my work could cure population of people who are suffering from this painful disorder. My work would be upon my satisfaction when it could cure millions of people and make them pain free so that they could live their rest of the lives happy and prosperously.

4. Source of Funding

None.

5. Conflict of Interest

None.

References

1. Dixon A, Dixon. Neurovascular compression syndromes. Radiopedia. GeorgeMandybur& Steven Bailey. Microvasculardecompression.Mayfield; 2018.
2. Hanakita J. Serious complications of Microvascular decompression operation for Trigeminal neuralgia and Hemifacial spasm. National Library of Medicine; 1998.
3. Pabaney A. Microvascular decompression for Trigeminal neuralgia. Neurosurgical Atlas; 2020.
4. Ryan J, Soose, Carl H, Synderman, Amin B, Kassam, et al. Teflon Granuloma of Skull Base. A complications of endonasal brain surgery. Thieme Medical Publishers; 2007. p. 242–252.
5. Chen J. Teflon Granuloma after Microvascular decompression for Trigeminal neuralgia. National Library of medicine; 2000.
6. Nathan C, Pecorra. Geniculate neuralgia successfully treated with Microvascular decompression. *Interdisciplinary Neurosurgery*. 2020;.
7. Cleveland clinic. Glossopharyngeal neuralgia. Reviewed. 2019;.
8. Mandybur G. Hemifacial spasm (tic convulsif). Mayfield clinic; 2018.

Author biography

Mayukh Pandit UG Researcher (Member of American College of Physicians)

Cite this article: Pandit M. **Introduction of MOLUMA'S Implant-An Innovation to permanent cure of Trigeminal neuralgia and several Neurovascular compression syndrome.** *IP Indian J Neurosci* 2020;6(2):101-103.