Case Report

Redo Microvascular Decompression in a Patient of Resistant Cochleovestibular Nerve Compression Syndrome

Abstract
Cochlea-vestibular nerve compression syndrome (CVCS) may present as recurrent attacks of vertigo, dizziness, imbalance, etc. Those patients who do not respond to medical management, are usually managed by “microvascular decompression (MVD) of cochlea-vestibular nerve.” The success rate of MVD is not 100% and few patients present with the recurrence of symptoms. We are reporting management of one such resistant case of CVCS. A 40-year-old female patient who was a known case of CVCS, was managed by medical and surgical (MVD) management. She had no relief of symptoms. We did redo MVD of cochlea-vestibular nerve after full evaluation of symptomatology. Patient had complete relief in her symptoms. In failed MVD cases, redo MVD can be performed if patient is still having e/o nerve compression, adhesions on magnetic resonance imaging.

Keywords: Anterior inferior cerebellar artery, cochlea-vestibular nerve compression syndrome, microvascular decompression, Teflon, vertigo

Introduction
Cochlea-vestibular nerve compression syndrome (CNCS) may be caused by compression of cochleo-vestibular nerve from arterial loop, most commonly anterior inferior cerebellar artery (AICA) or mass lesion.[1] It is characterized by variety of symptoms, for example, repeated attacks of vertigo, tinnitus, hearing loss, and balance difficulty.[2,3] Medical treatment is used as first-line management, but few patients do not respond. Few studies have reported the use of microvascular decompression (MVD) of 8th nerve in treatment of these resistant cases with encouraging results.[4-6] There may be some cases who fail with initial surgical treatment. It is unclear if there can be a role of redo MVD in such cases. We are reporting about a female patient who had recurrent CNCS after initial MVD of the 8th nerve and she responded after redo MVD.

Clinical Presentation
A 40-year-old female patient had history of attacks of vertigo on changing position of head for the past 12 years. The onset was insidious and sometimes it was associated with vomiting. There was no relief after vomiting or lying down. She first consulted ENT specialist and was diagnosed as a case of “Meniere’s Disease.” She underwent two procedures, first was injection Gentamycin in the left ear, 3 years back and there was no relief. Later on, she underwent right endolymphatic sac fenestration, still there was no relief. She was referred to neurosurgeon who diagnosed her as a case of “CNCS.” She underwent MVD of the right 7th-8th nerve. Teflon patch graft was used to separate AICA and 7th-8th nerve complex. The records of the patient also revealed that she underwent vestibular neurectomy simultaneously. She developed right side hearing loss in the postoperative period. Initially, she improved for 9 months; however, symptoms recurred in the form of episodes of vertigo, refractory to medical management (tablet β-histine 64 mg and tablet cinnarizine 120 mg daily)

On examination, she had 30%-40% sensory loss in territory of the right V1, V2, and V3 nerve and complete sensorineural deafness on same side. There was no other neurological deficit.

Radiology
Constructive interference in steady-state of magnetic resonance imaging (MRI) showed loop of AICA compressing right 7th-8th nerve complex with a

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lesion (Teflon graft) in right cerebellopontine angle (CPA) cistern [Figure 1].

Operative technique

Patient underwent surgery, that is, redo MVD of 7\textsuperscript{th}–8\textsuperscript{th} nerve complex, after informed consent. Surgery was performed under general anesthesia using sitting position with due precautions. Previous operative site (retromastoid-retrosigmoid, suboccipital craniectomy) was re-explored. Cerebellum was adhered to Dura. 7\textsuperscript{th}–8\textsuperscript{th} nerve complex along with AICA loop was visualized. Teflon graft was densely adhered to nerve complex and was compressing it [Figure 2]. The Teflon graft was removed using meticulous sharp dissection.

We also observed that the continuity of 7\textsuperscript{th}–8\textsuperscript{th} nerve complex was maintained despite previous record of vestibular neurectomy. However the nerve complex was thinned out, which was cut [Figure 3]. The 7\textsuperscript{th} nerve was seen preserved and carefully dissected out from the adhesions. A new Teflon ring graft (3.5 mm) was used to separate AICA from the 7\textsuperscript{th} to 8\textsuperscript{th} nerve complex [Figure 4]. The trigeminal and lower cranial nerves were identified and preserved.

Patient got relief from repeated attacks of vertigo in immediate postoperative period. She developed right side partial facial weakness (house - Brackmann Grade 2). There was no other focal deficit. Patient was discharged after 7 days. She was taught facial exercises. She was followed up after 14 days. Her facial weakness improved to some extent. Patient was relieved from vertigo completely. A follow up after 3 weeks showed complete recovery from vertigo and facial palsy.

Discussion

Patient of CNCS who are resistant to medical treatment, they are treated by MVD.\textsuperscript{[4–6]} The efficacy of MVD is around 65\%–80\% as reported by various studies.\textsuperscript{[4–7]} Few patients who do not respond to MVD, are managed by medical treatment. The results of medical treatment is however unsatisfactory. Such patients can be managed by redo MVD. PTFE or Teflon graft is usually the material of choice for MVD because it is inert, well-tolerated in the nervous system, resistant to resorption, and has a lower complication rate than other materials.\textsuperscript{[8]} In spite of this safety profile, inflammatory foreign-body reactions, granuloma formation, and fibrosis can occur at the site of implantation. There are very few studies that have reported about treatment of failed cases of MVD in trigeminal neuralgia due to inflammatory granuloma formation, but there is no published study of MVD in vertigo due to CNCS.\textsuperscript{[9–13]}

The MVD of 7\textsuperscript{th}–8\textsuperscript{th} nerve complex requires special attention when compared with MVD of 5\textsuperscript{th} nerve. The cochlear nerve as a sensory cranial nerve, has longer root entry zone (REZ) when compared with the motor cranial nerves. REZ of the cochlear nerve runs through entire CPA.
cistern starting from the internal auditory foramina.[7,14] Therefore, all surrounding blood vessels from the internal auditory foramina to REZ region, should be pushed aside and separated, and all the tissue adhesion should be sharply dissected to get complete relief and prevent recurrence.

Re-do surgery is difficult due to dense adhesions between neurovascular complex. The adhesions should be sharply dissected. Blunt dissection or traction can result into injury of neurovascular complex.

Our shortcoming was no use of electrophysiological monitoring of VII nerve. It could have helped us in preventing facial palsy.

**Conclusion**

MVD is the best choice for management of resistant CNCS cases. For failed MVD cases, redo MVD can be done if patient is still having e/o nerve compression, adhesions on MRI. However, redo surgery needs great preoperative planning, experience and surgical skills.

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**Conflicts of interest**

There are no conflicts of interest.

**References**