



Endoscopic Microvascular Decompression: Precision Surgery for Neurovascular Conflict in Trigeminal Neuralgia

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Abstract

Introduction: Trigeminal neuralgia (TN) also known as tic douloureux, is a chronic pain condition that causes severe and sudden facial pain. This pain is due to the compression or distortion of the trigeminal nerve by vascular structures. This neurovascular conflict often manifests as electric-shock like pain. The pain is predominantly seen in individuals over 40. The primary causes include neurovascular compression, while some secondary causes involve tumors or multiple sclerosis. Endoscopic Microvascular Decompression (EVD) is proposed as a precise and minimally invasive surgical technique for medication-resistant trigeminal neuralgia (TN).

Materials and Methods: Endoscopic Microvascular decompression, Trigeminal neuralgia, neurovascular conflict, were predefined terms in our search strategy, and we thoroughly searched electronic sources including PubMed, Google Scholar, and Cochrane Library from 2009 to 2023. We included studies that evaluated the efficacy and safety of EVD compared to Microscopic Vascular Decompression (MVD). Key metrics included postoperative pain relief, complications, and visualization efficacy during the procedure.

Results: The studies we examined showed that Endoscopic Microvascular Decompression (EVD) provided immediate and or complete pain relief in patients with severe symptoms. It is worth noting that no mortality was associated with EVD. However, we noted some temporary, reversible, and unfavourable effects like hearing loss, facial paralysis, or cerebrospinal fluid leakage. The most commonly involved vessels in this neurovascular conflict in descending order are the superior cerebellar artery, inferior cerebellar artery and a combined Superior cerebellar artery- anterior inferior cerebellar artery compression. Enhanced visualization enabled by angled endoscopes facilitated precise decompression and reduced the need for brain retraction.

Conclusion: Endoscopic Microvascular Decompression (EVD) has proven to be a secure and effective intervention and procedure for neurovascular compression in trigeminal neuralgia compared to Microscopic Vascular Decompression (MVD). The ability of EVD to provide a broad and better view of the path of the nerve as well as the interactions of vessels combined with reduced complications makes EVD to be a superior technique for getting optimal surgical outcomes in trigeminal neuralgia patients.

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