Chapter 5
Microsurgical Nuances in the Management of Trigeminal Neuralgia

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ABSTRACT

Microvascular decompression (MVD) is a highly effective surgical treatment for patients with trigeminal neuralgia (TN) caused by arterial compression. In cases of TN without arterial compression of the nerve, however, a variety of other surgical treatments can be effective for pain relief including neurolysis, nerve section, and placement of a tentorial sling. In this chapter, the authors discuss the nuances of surgical interventions for TN outside of standard MVDs. They also explore recent innovations in MVD surgery for TN.

DOI: 10.4018/978-1-5225-5349-6.ch005
INTRODUCTION AND BACKGROUND

Trigeminal neuralgia (TN) is a severe, lancinating pain most often caused by arterial compression at the trigeminal nerve root entry zone. Microvascular decompression (MVD) surgery is one of the most common surgical treatments for TN, and demonstrates high rates of short- and long-term pain relief (Wang et al., 2017). The goal of this procedure is separation of the compressive artery from the nerve root entry zone, which is classically achieved by placement of a piece of Teflon between the two structures. However, up to 30% of TN cases occur in the absence of a compressive lesion (Bederson & Wilson, 1989; Zhao, Zhang, Tang, & Li, 2017). This finding may only be evident upon exploration of the posterior fossa and requires consideration of other causative pathologies and treatments. In these situations, venous compression or intraneural vessels are sometimes encountered, and can be surgically addressed to provide pain relief (Hong et al., 2011; Matsushima, Huynh-Le, & Miyazono, 2004). In the absence of an identifiable intraoperative pathology, alternative treatments to relieve nerve pain, such as internal neurolysis or partial/complete sectioning have also demonstrated efficacy and can be considered (Ko et al., 2015; Zhao et al., 2017; Zhou et al., 2016). Even in cases without atypical intraoperative findings, neurosurgeons should also be aware of the ongoing development and applications of novel operative techniques for TN, such as the use of a tentorial sling to transpose compressive arteries (Steinberg et al, 2017), and intra-operative nerve monitoring to assess cranial nerve function in real time (Brock, Scaioli, Ferroli, & Broggi, 2004; C. C. Lee et al., 2014). A thorough understanding of the indications and operative considerations for revision surgeries is also critical when assessing cases of recurrent TN following an MVD.

In this chapter, we discuss the operative nuances of MVD surgery for TN, including the intra-operative considerations and treatment options available in the absence of a compressive artery. The role of MVD-related surgical innovations for TN, such as tentorial slings and intra-operative nerve monitoring, are also reviewed. Finally, the practices and pitfalls related to revision procedures for TN are explored.
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