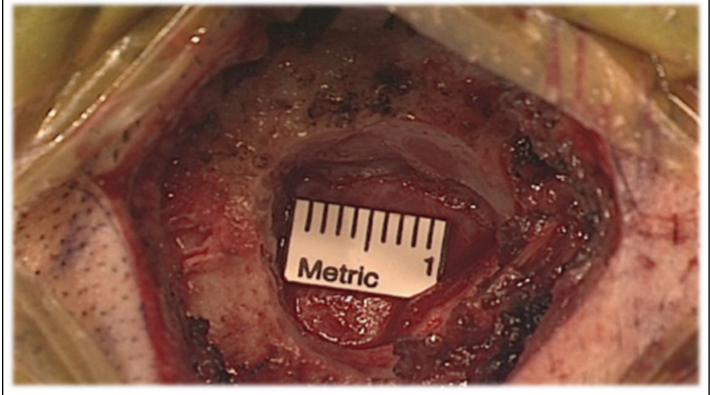


Background

Microvascular decompression (MVD) has become the accepted surgical technique for the treatment for trigeminal neuralgia (TN) due to positive surgical outcomes and prevention of long-term recurrence. Reduction in size of the microscope and refined instrumentation have resulted in a modern-day craniotomy and surgical corridor size that is comparable to endoscopic procedures, improving pain outcomes and lowering complication rates. Positive outcome rates of MVD for TN are between 77 to 98%, with a majority of patients pain-free and asymptomatic at follow-up. There are, however, a number of significant complications that can develop due to the retraction of the cerebellum and stretching of vasa nervorum and other factors resulting in cerebral spinal fluid (CSF) leak, facial paralysis, hearing loss and sequelae of cerebellar damage.

Similar dural opening size 1cm and surgical time (MVD 129, EA-MVD 137, MVD 130 minutes)

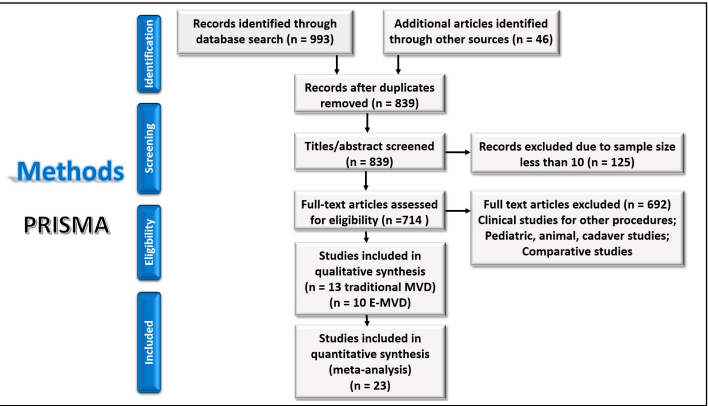


Introduction

MVD is commonly used in the treatment of trigeminal neuralgia with positive clinical outcomes. Fully endoscopic microvascular decompression (E-MVD) has been proposed as a minimally invasive, effective alternative, but a comparative review of the two approaches in the literature has not been conducted. We performed a meta-analysis comparing patient outcome rates and complications for both techniques.

Methods

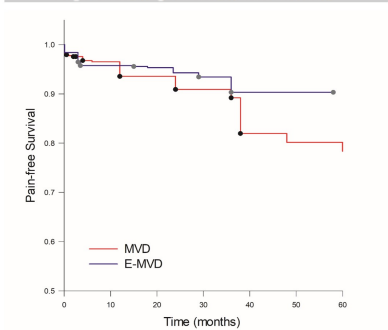
From a pool of 1,039 studies, 22 articles, each with sample size greater than 30 patients were selected for review: 12 traditional MVD and 10 E-MVD. The total number of patients was 6,734 of which 5768 patients (and 5787 procedures) were MVD and 966 patients and procedures were E-MVD. Data analyzed included postoperative pain relief outcome (complete or good pain relief versus partial or no pain relief), and rates of recurrence and complications, including facial paralysis, weakness, or paresis; hearing loss; auditory and facial nerve damage; cerebrospinal fluid leak, infection; cerebellar damage; and mortality.



Results

Summary of meta-analysis comparing open series with E-MVD series with 95% confidence interval		
Outcome & complications	Open MVD series (95% CI)	E-MVD series (95% CI), P value
Pain relief outcome (complete vs. partial or absent)	81% (74 - 86%)	88% (83 - 93%)
Recurrence rate (major or minor)	14% (8 - 21%)	9% (5 - 14%)
Total complications following surgery	19% (10 - 30%)	8% (5 - 13%), p=0.0374
Facial paresis or weakness	9% (4 - 16%)	3% (0 - 8%), p=0.0567
Hearing loss	4% (2 - 6%)	1% (0 - 3%), p=0.0373
CSF leak	3% (1 - 6%)	3% (2 - 4%)
Cerebellar injury	2% (0 - 4%)	< 1% (0 - 0.2%), p=0.0048
Infection	2% (0 - 3%)	< 1% (0 - 0.2%), p=0.0013
Death	< 1% (0 - 2%)	0%, p=0.0075

Kaplan-Meier pain-free survival curves



Conclusions

The reviewed literature revealed similar clinical outcomes with respect to pain relief for MVD and E-MVD. Recurrence rate and incidence of complications, notably facial paresis and hearing loss were higher for MVD than E-MVD. Based on these results, use of endoscopy to perform MVD for TN appears to offer at least as good a surgical outcome as the more commonly used open MVD, with the possible added advantages of having a shorter operative time, smaller craniectomy and lower recurrence rates. The authors advise caution in interpreting this data given the asymmetry in the sample size between the two groups and the relative novelty of the E-MVD approach.

Selected References

- Artz GJ, Hux FJ, Larouere MJ, Bojrab DI, Babu S, Pieper DR: Endoscopic vascular decompression. Otol Neurotol 29:995-1000, 2008
- Bakker NA, Van Dijk JM, Immenga S, Wagemakers M, Metzemaekers JD: Repeat microvascular decompression for recurrent idiopathic trigeminal neuralgia. J Neurosurg 121:936-939, 2014
- Bohman LE, Pierce J, Stephen JH, Sandhu S, Lee JY: Fully endoscopic microvascular decompression for trigeminal neuralgia: technique review and early outcomes. Neurosurg Focus 37:E18, 2014
- Chen MJ, Zhang WJ, Yang C, Wu YQ, Zhang ZY, Wang Y: Endoscopic neurovascular perspective in microvascular decompression of trigeminal neuralgia. J Craniomaxillofac Surg 36:456-461, 2008
- El-Garem HF, Badr-El-Dine M, Talaat AM, Magnan J: Endoscopy as a tool in minimally invasive trigeminal neuralgia surgery. Otol Neurotol 23:132-135, 2002