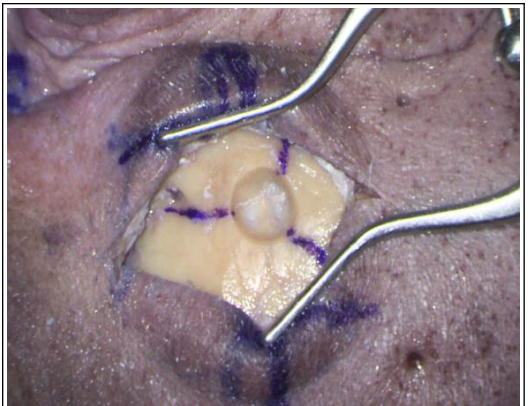


Introduction

Microvascular decompression (MVD) represents the gold standard for treatment of TN. The complication rate of MVD is low, but there remains the risk of permanent hearing impairment from damage to the vestibulocochlear nerve caused by excessive retraction of the cerebellum. We investigate a less invasive approach using a minimally invasive tubular retractor system and assess the feasibility of this approach using both microscopic and endoscopic techniques.

Methods

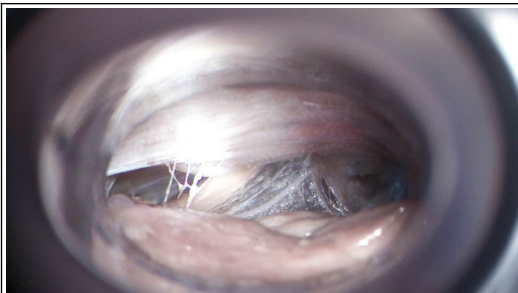
MVD was performed 5 preserved cadaveric heads. A 1.5 cm retrosigmoid keyhole craniotomy was used to expose the upper neurovascular structures of the cerebellopontine angle. A ViewSite™ Brain Access System of tubular retractors (Vycor Medical, Inc., Boca Raton, FL, USA) was placed into the keyhole and advanced into the lateral aspect of the upper cerebellopontine angle.



Enlarged skin incision to show the surgical landmarks for keyhole placement.

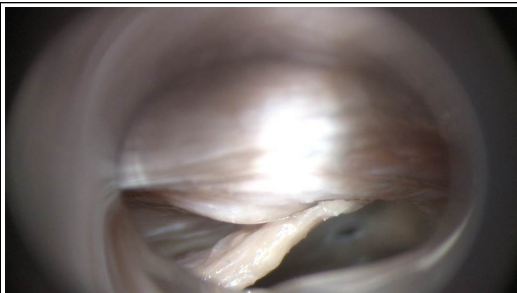


Tubular retractor placement.



Initial cerebellar retraction (top) and opening of the arachnoid (bottom).

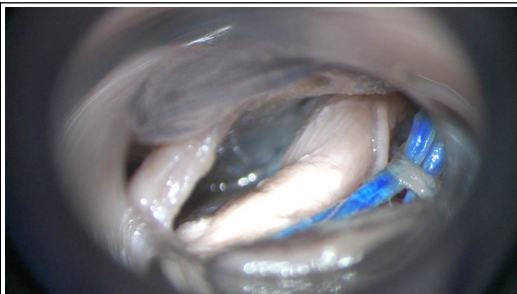
The trigeminal roots were easily identified and their relationships with neighboring vessels were thoroughly examined.



The facial nerve is identified after arachnoid dissection and tubular retractor is moved superiorly.

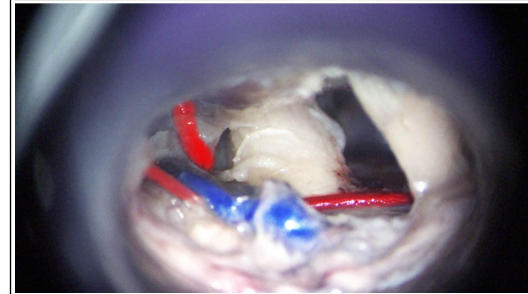
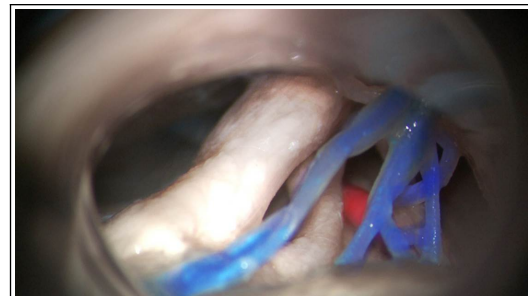
Results

The tubular retractor applied rigid, constant, and equally distributed pressure on the cerebellum, and allowed the surgeon to reach the CPA without undue cerebellar retraction. Endoscopic instruments and an electric drill were passed through the tubular retractors without difficulty. Excellent visualization of



The tubular retractor is swiveled superiorly to show the facial nerve.

the surrounding neurovascular structures was achieved. Enhanced intraoperative visualization is clinically beneficial as the majority of failed MVD's are caused by misidentification of the offending vessel due to insufficient surgical exposure.



Trigeminal roots, petrosal vein, and left superior cerebellar artery are exposed. Relationship between the superior and anterior inferior cerebellar arteries and right CN V.

Conclusions

The use of transtubular retractors in trigeminal MVD is both feasible and effective in avoiding excessive retraction. The tubular retractor reduces the risk of damage to the surrounding nerves and provides excellent surgical maneuverability. Further clinical studies are necessary to determine clinical efficacy.