

# The simpler the better: a personal philosophy of microvascular decompression surgery

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Microvascular decompression (MVD) has been widely accepted as the most effective remedy for hyperactive cranial rhizopathy, such as hemifacial spasm and trigeminal neuralgia.<sup>[1,2]</sup> With popularization of this surgery around the world, numerous neurosurgeons have presented their opinions concerning operative skills. For instance, some authors stated that the point of this process is to detach rather than to isolate the neurovascular conflict with Teflon insertion between them.<sup>[3]</sup> It has been believed that “transposition” is better than “interposition”.<sup>[4]</sup> In order to achieve an utter separation, “sling technique” has been frequently reported nowadays.<sup>[5]</sup> Regardless of varied techniques, however, we should always put safety first while performing this functional neurosurgery. It is imaginable that the more complicated technique is employed, the more instruments or foreign bodies invade the surgical field, the more time elapses, and the more chances of postoperative complications incur eventually. Actually, this MVD operation could have been completed in a more easy and simple fashion. After accomplishment of more than 10,000 MVDs in our center,<sup>[6,7]</sup> we have learned to go through the operation with minimal procedures in less time. In this paper, the author advanced a strategy of “three noes” for a safe and effective MVD.

## No complicated technique

We noticed that the sling technique has become fashionable recently in the literature.<sup>[8]</sup> In such a small surgical field, however, while the surgeon is concentrating on these procedures of passing a thread around the artery and then stitching and knotting, those surrounding delicate structures, such as facial and vestibulocochlear nerves as well as petrosal veins, are actually in jeopardy. Especially, when the needle is penetrating the petrous dura or the tentorium, a burst may be inevitable at the moment—that’s really

dangerous.<sup>[9]</sup> Lately, some authors do have improved the technique, for example, the thread was replaced by Teflon or other materials and no stitching or knotting was needed when glue or clip was adopted.<sup>[10,11]</sup> Whatever, it still consumes more time to finish these extra procedures while the cerebellum needs to be retracted with a spatula. Actually, a satisfactory exposure could have achieved by efficient dissection instead of retraction. In our experience, even a dolichoectatic vertebrobasilar complex could be moved away without sling. With the arachnoid being opened thoroughly, the cerebellar hemisphere could be raised enough to expose the brainstem very medially. As this wider exposure is achieved, gelfoams or Teflon waddings can be easily inserted between the vertebral artery and the medulla piece by piece from low towards tentorium. When the rostral facial nerve root is reached, it would be found that the artery has been mobilized laterally and proximally without tension. Compared with a distal pull (sling), this proximal push is easier to keep the arterial transposition without rebound.<sup>[12-16]</sup> Accordingly, it is worth spending time in dissecting caudal nerves instead of slinging a tortuous vertebral artery laterally. Especially in most hemifacial spasm (HFS) cases, this caudal and medial dissection is essential to expose the neurovascular conflict.

## No unnecessary instrument

The decompression process can be completed merely by means of a microdissector and a microsuction under coordinating control of the operator’s both hands.<sup>[6]</sup> We never use forceps to move arteries for clamping may give rise to vasospasm. Even the Teflon could be advanced to position without forceps. It could be delivered directly by a microdissector with a small ball of soft Teflon sticking on the tip. The placement should be carried out piece by piece for a bulk of Teflon may block the line of sight and inadvertently push the vessel behind towards the nerve

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instead. Besides, the emplacement should be managed to avoid the very conflict site. It has been attested that a granuloma developed at the site could be a new culprit accounting for the recurrence.<sup>[17-19]</sup> Therefore, as long as the offending artery can be kept detaching from the nerve following an appropriate dissection, the Teflon could be waived even. Retracting blades are also unnecessary because a narrow suction tip on a padding cottonoid actually affords more room than a wider spatula does at the moment when a local area is being dissected.

### No waste manipulation

It is suggested that the MVD process should be completed promptly for the odds of complications growing over time. However, it is not alluded to finish the operation rashly, instead every single step should be performed very efficiently and properly.<sup>[6]</sup> If the dissection was not started from the lower nerves until a blocked flocculus was encountered, extra time had elapsed in the redundant manipulation. Generally, with a merely caudal dissection, the conflict is discovered in most HFS cases and no further rostral exposure is needed [Figure 1].<sup>[20-23]</sup> While in the trigeminal cases, those annoying petrosal veins are detoured with dissection starting from the VIII root instead of from the tentorium.<sup>[24]</sup> If a good angle is still unavailable in this approach, opening the cerebellar fissures offers a better exposure.<sup>[25]</sup> Besides, those pre-microscopic procedures should not be ignored. If you neglected them until you realize that the patient's shoulder hampers your arm to access the surgical field or the craniectomy confines lateral exposure, you have to remove the microscope and adjust the position or take out more bone with rongeur again. This halt not only consumes time but also upsets your operation. That is why a Chinese idiom says: "sharpening an axe will not hold up your work of cutting firewood".

### Conclusion

A successful MVD lies in a prompt identification of the neurovascular conflict, which hinges on a good exposure. A satisfactory working space can be achieved by an



**Figure 1:** A from-caudal-to-rostral approach to the neurovascular conflict. In most hemifacial spasm cases, the neurovascular conflict is located in the caudal REZ of the facial nerve (VII)—sometimes, even much more inferiomedially than you expected. So, it is wise to start dissection from the lower level medially. In this case, the offending artery (a) had been already mobilized proximally after caudal dissection. REZ: Root exit zone; VII: Facial nerve; VIII: Vestibulocochlear nerve; IX: Glossopharyngeal nerve.

appropriate positioning of the patient and a proper craniectomy as well as a rational approach (from caudal to rostral). With a thorough dissection of arachnoids, the cerebellum can be raised enough to expose more medially without retracting. In most cases, the offending artery can be pushed away proximally without adoption of complicated techniques. To keep the neurovascular separation, less Teflon is encouraged to place beyond the conflict. Ultimately, the most important thing should be safety, of course. To balance cure versus safety, this process should be completed promptly with minimal interference to the brain—the simpler the better!

### Conflicts of interest

None.

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