The Case
A 65 year old male presented with a 2 year history of progressive bilateral lower extremity weakness, reduced sensation and bowel incontinence. There was trace movement of left toes and no movement of right lower extremity. Sensation was absent below L1. MRI showed diffuse T2 signal hyperintensity of the thoracic cord. (Figure 1.)

Angiography revealed a left T8 type 1 dural arteriovenous fistula (dAVF). (Figure 2.) Pharmacologic provocation testing (PPT) utilizing electrophysiologic monitoring (SSEPs an MEPs) and possible embolization was performed under TIVA general anesthesia. Highly selective angiography of the left T8 radicular artery revealed a vein with abnormal early filling as well as a normal smaller artery possibly feeding the anterior spinal artery (figure 2.) Only left leg MEPs were present at baseline. SSEPs and right leg MEPs were absent. (figure 3.)

To determine if embolization could be performed without compromising the spinal artery, PPT was performed. 2mg methohexital was injected through the microcatheter into the T8 radicular artery, which produced no change in MEPs. Next injection of 20 mg of lidocaine caused transient loss of MEPs. (figure 4.) Embolization was aborted and open surgical treatment was indicated based on these findings. A T7-8 laminectomy and clipping of dAVF was successfully performed with stable left leg MEPs suggesting sparing of spinal cord blood supply. (figure 5.) Postop neurological status was unchanged.

Discussion
PPT combined with EP monitoring is believed to enhance the safety of endovascular neurosurgical procedures under GA1. Provocative testing with barbiturates and lidocaine temporarily depresses neuronal and axonal function respectively2. High negative predictive value of PPT with SSEPs and MEPs enhances the safety of embolization of spinal AVFs3. PPT with EP monitoring modified the treatment course and potentially improved outcome in this case. 

References

1. To determine if embolization could be performed without compromising the spinal artery, PPT was performed. 2mg methohexital was injected through the microcatheter into the T8 radicular artery, which produced no change in MEPs. Next injection of 20 mg of lidocaine caused transient loss of MEPs. (figure 4.) Embolization was aborted and open surgical treatment was indicated based on these findings. A T7-8 laminectomy and clipping of dAVF was successfully performed with stable left leg MEPs suggesting sparing of spinal cord blood supply. (figure 5.) Postop neurological status was unchanged.

2. PPT combined with EP monitoring is believed to enhance the safety of endovascular neurosurgical procedures under GA. Provocative testing with barbiturates and lidocaine temporarily depresses neuronal and axonal function respectively. High negative predictive value of PPT with SSEPs and MEPs enhances the safety of embolization of spinal AVFs. PPT with EP monitoring modified the treatment course and potentially improved outcome in this case. 

References