Draining vein of spinal dural arteriovenous fistula perforating the dura at segments different from the fistula: Atypical course complicates surgery

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COI Disclosure
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Objective

✓ In surgery for spinal dural arteriovenous fistulae (SDAVF), draining veins that typically perforate the dura at the fistular segment are divided in the dural theca.

✓ We present 2 patients with SDAVF whose draining veins perforated the dura at a segment different from the fistula.
Case 1

70 yo/M with paraparesis, numbness, urinary disturbance

SDAVF fed by the left 6th intercostal artery with cephalad venous drainage (arrows)
No typical intradural draining vein was found at the fistular level.

The draining vein (arrows) ran on the outer surface of the dura from the SDAVF at the T6 dural root sleeve to the T5 root sleeve, and perforated the dura at the T5 root sleeve. The draining vein at the T5 root sleeve was successfully divided and his symptoms improved.
Case 2

51 yo/M with paraparesis, numbness, urinary disturbance

SDAVF fed by the left 8th intercostal artery with cephalad venous drainage (arrows)
**Intraoperative Findings**

No typical intradural draining vein was found at the fistular level.

The draining vein *(arrows)* ran on the outer surface of the dura from the SDAVF at the T8 dural root sleeve to the T7 root sleeve.

The draining vein perforated the dura at the T7 root sleeve.
Each structure was opacified in turn, the SDAVF at the T8 dural root sleeve, the draining vein on the dura, the dural perforation of the vein at the T7 root sleeve, and the intradural draining vein.

The draining vein at the T7 root sleeve was successfully divided and his symptoms improved.
Discussion

The observed atypical patterns were…

✔ partially similar to SDAVF fed by multiple feeders: the vasculature coursed longitudinally on the dura

![Diagram showing Atypical Pattern and Multiple Feeder Pattern (Anson Type I-B)*]

✔ not included in the existing classification

✔ observed in 2 of our 22 cases (9.1%)

*Anson JA: BNI Quarterly 8:2, 1992
difficult to be identified preoperatively

However, the diagnosis of an atypical course is helped when the draining vein (*arrows*) runs parallel to the spinal canal.

Current 3D computer graphics based on the fusion of 3D angiography and postmyelographic CT (*Takai K: J Neurosurg Spine 15:654, 2011*) may depict this course.
Conclusions

✓ Atypical courses of draining veins in patients with SDAVF may be overlooked, resulting in unfavorable surgical outcomes.

✓ Therefore, atypical drainer courses must be identified by careful inspection of the surgical field.