

phase.<sup>3</sup> But, whether it is safe or has a beneficial role during predissection phase, is not clear. This patient belonged to a good SAH grade and theoretical concerns of hyperventilation have been clearly defined.<sup>4</sup> Yet, to achieve relaxed brain, we resorted to hyperventilation as a quick maneuver to facilitate surgical exposure. However, prompt aneurysm obliteration together with maintenance of normotension during the procedure resulted in good outcome of the patient.

In conclusion, we reiterate the theoretical teaching that during aneurysm surgery, hyperventilation should not be instituted acutely in good-grade patients to decrease ICP, especially before dural opening. If intracranial pressure is to be decreased then utmost care should be taken not to suddenly increase the TMP gradient.

#### Conflict of Interest

None declared.

#### References

- 1 Batjer H, Samson D. Intraoperative aneurysmal rupture: incidence, outcome, and suggestions for surgical management. *Neurosurgery* 1986;18(6):701–707
- 2 Rosenørn J, Westergaard L, Hansen PH. Mannitol-induced rebleeding from intracranial aneurysm. Case report. *J Neurosurg* 1983;59(3):529–530
- 3 Luostarinen T, Takala RS, Niemi TT, et al. Adenosine-induced cardiac arrest during intraoperative cerebral aneurysm rupture. *World Neurosurg* 2010;73(2):79–83, discussion e9
- 4 Guy J, McGrath BJ, Borel CO, Friedman AH, Warner DS. Perioperative management of aneurysmal subarachnoid hemorrhage: Part 1. Operative management. *Anesth Analg* 1995;81(5):1060–1072



Correspondence

## Dry Spinal Tap

Bessie Kachulis<sup>1</sup> Apostolos J. Tsiouris<sup>2</sup> Priscilla Nelson<sup>1</sup> Irene Stadnyk<sup>1</sup>

<sup>1</sup>Department of Clinical Anesthesiology, Weill Cornell Medicine, New York, New York, United States

<sup>2</sup>Department of Clinical Radiology, Weill Cornell Medicine, New York, New York, United States

*J Neuroanaesthesiol Crit Care*:2021;8:82–83

Spinal catheter placement may be challenging for the anesthesiologist, as it is performed blindly using a landmark-based technique. Understanding the patient's spine anatomy, optimal patient position, and clinical experience contribute to successful placement.<sup>1</sup> Spinal deformities, congenital spinal stenosis, chronic degenerative disease, and obesity increase the difficulty of placement.

The position of the needle and catheter in the subarachnoid space is confirmed clinically by the presence of free-flowing cerebrospinal fluid (CSF). The absence of CSF is considered a failed attempt to access the thecal sac. This could be contributed to needle misplacement, needle blockade, previous spinal surgery, or low-CSF pressure.<sup>2</sup>

We experienced a situation where a lumbar spinal drain placement was attempted under general anesthesia in the

**Address for correspondence** Bessie Kachulis, MD, Department of Clinical Anesthesiology, Weill Cornell Medicine, 525E 68th Street Box 124, New York, NY 10065, United States (e-mail: kachuli@med.cornell.edu).

lateral position, using a standard spinal drain kit. The patient was a female in her late fifties with normal body habitus undergoing surgery for thoracoabdominal aneurysm repair. Spinal drain was placed for spinal cord protection. Initially, the needle was suspected to be in the correct location, based on the anatomic landmarks, a “give sensation,” and a very small amount of fluid which filled the spinal needle to the hub. No free-flowing CSF was noted. Unfortunately, confirmation of correct spinal drain catheter placement by clinical standards was impossible, since there was drainage, even with aspiration. The catheter was removed and subsequent trials to access CSF by other experienced anesthesiologists were unsuccessful. A neuroradiologist was consulted, and the catheter was placed fluoroscopically. Correct positioning of the needle and then the catheter was confirmed by contrast

**Published online**  
August 26, 2020

**DOI** <https://doi.org/10.1055/s-0040-1715358>  
**ISSN** 2348-0548.

©2020. Indian Society of Neuroanaesthesiology and Critical Care. This is an open access article published by Thieme under the terms of the Creative Commons Attribution-NonDerivative-NonCommercial-License, permitting copying and reproduction so long as the original work is given appropriate credit. Contents may not be used for commercial purposes, or adapted, remixed, transformed or built upon. (<https://creativecommons.org/licenses/by-nc-nd/4.0/>). Thieme Medical and Scientific Publishers Pvt. Ltd. A-12, 2nd Floor, Sector 2, Noida-201301 UP, India

injection; even then, there was no drainage of CSF. Several hours later, CSF started to drain with the patient in the sitting position.

Interestingly, it is possible for the needle to be correctly positioned within the thecal sac, yet have no egress of CSF.<sup>3</sup> Ramachandran et al and Das et al reported successful spinal anesthesia, where a “give” was felt but no CSF was seen, even upon aspiration.<sup>2,4</sup> When lumbar punctures are performed under fluoroscopy, as is standard practice for neuroradiologists, visual confirmation of the needle location is possible. If the needle is correctly positioned but there is no CSF flow, contrast is injected to confirm intrathecal placement; this is called “dry spinal tap.”<sup>3</sup> In cases where access is not successful even with fluoroscopy, CT guidance may be required.<sup>3</sup>

The most common reason for a dry spinal tap is dehydration. Other reasons include severe spinal stenosis or narrowing of the thecal sac, which can occur in lipomatosis or arachnoiditis. Dry spinal tap has been described in a patient with iliopsoas abscess expanding into the epidural spaces.<sup>5</sup>

At the time of the procedure, patient hydration with IV fluids, a Valsalva maneuver, reverse Trendelenburg (head elevated) positioning or sitting position may help fill the distal thecal sac.

To date, there is lack of anesthesiology literature on this important issue. It is essential for anesthesiologists to realize that failure to access CSF may not be due to bad technique and needle misplacement, but instead due to a dry spinal tap. Prompt realization, hydration, and fluoroscopy-assisted placement may prevent multiple attempts, which can lead to patient complications.

#### **Conflict of Interest**

None declared.

#### **References**

- 1 Duniec L, Nowakowski P, Kosson D, Łazowski T. Anatomical landmarks based assessment of intravertebral space level for lumbar puncture is misleading in more than 30%. *Anaesthesiol Intensive Ther* 2013;45(1):1–6
- 2 Ramachandran K, Ponnusamy N. Dry tap and spinal anesthesia. *Can J Anaesth* 2005;52(10):1104–1105
- 3 Hudgins PA, Fountain AJ, Chapman PR, Shah LM. Difficult lumbar puncture: pitfalls and tips from the trenches. *Am J Neuroradiol* 2017;38(7):1276–1283
- 4 Das HK, Gunjal MK, Toshikhane HD. Spinal anesthesia in a caesarian case after dry tap. *Anesth Essays Res* 2014;8(1):103–104
- 5 Sahu DK, Kaul V, Parampill R. “Dry tap” during spinal anaesthesia turns out to be epidural abscess. *Indian J Anaesth* 2012;56(3):287–290