CORRESPONDENCE

Tympanic membrane rupture during robotic-assisted laparoscopic prostatectomy

David A. Maerz, MD · Daniel M. Gainsburg, MD

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To the Editor,

We report a case of a 63-yr-old man who presented to our hospital to undergo robotic-assisted laparoscopic prostatectomy with bilateral lymph node dissection. During the preoperative examination, he denied any known past medical history, allergies, or medication usage. The proposed surgery and anesthetic technique were discussed and he consented to undergo general anesthesia with endotracheal intubation.

Following arrival to the operating room, standard monitors were applied. All vital signs were within normal limits. Induction of anesthesia was achieved, and the patient was intubated atraumatically. The patient was placed in the lithotomy position, with arms tucked and bolsters placed above the shoulders and following standard preparation and draping, he was placed in a 40° Trendelenburg position. He remained hemodynamically stable throughout the procedure.

Approximately 90 min into the procedure, however, blood was observed to be actively draining from the patient's right ear. No changes in vital signs were observed. The surgeon was informed, the robot undocked, and the patient taken out of the Trendelenburg position and placed in a neutral position. An otolaryngologist was consulted intraoperatively and otoscopic examination revealed a small superior tympanic membrane perforation with evidence of recent, but not active, bleeding. The procedure was completed after

resumption of the Trendelenburg positioning and there was no further evidence of otorrhagia.

On the first postoperative day, after complaints of right ear pain with some sensation of hearing loss, the patient was re-evaluated by an otolaryngologist. On further discussion, he admitted to a history of chronic ear infections during childhood but had no recent history of infections (during the past 20 years). Treatment was initiated with ciprofloxacin-dexamethasone 0.3-0.1% otic suspension drops. At a follow-up telephone call a week after discharge, he reported resolution of the ear pain but had some residual hearing deficit. The hearing deficit had resolved a month later.

Use of the steep Trendelenburg position is associated with a number of concerns relating to venous congestion, including facial and laryngeal edema, as well as the potential for increased intraocular and intracranial pressure and even cerebral edema.¹⁻³ There are few prior reports, however, of otorrhagia caused by Trendelenburg positioning. We believe that this is the first report involving an intraoperative diagnosis of tympanic membrane perforation. Prior reports described vascular congestion in the middle ear canal leading to desquamation and bleeding.⁴

The physics of tympanic membrane and middle ear pressure regulation rely on the presence of the Eustachian tube to provide patency between the nasopharynx and middle ear to allow constant equalization with atmospheric pressure. At rest, the Eustachian tube is partially collapsed and relies on its opening via contraction of the tensor veli palatine muscle during swallowing. The venous congestion that occurs while in the Trendelenburg position can impede the ability of the Eustachian tube to open, resulting in loss of this compensatory mechanism.⁵ Individuals with a history of chronic ear infections can be left with a relatively non-compliant and scarred tympanic membrane

D. A. Maerz, MD (✉)
Department of Anesthesiology, Icahn School of Medicine at Mount Sinai, New York, NY, USA
e-mail: David.Maerz@mountsinai.org

D. M. Gainsburg, MD
Departments of Anesthesiology and Urology, Icahn School of Medicine at Mount Sinai, New York, NY, USA

that may be even more vulnerable to the lack of regulation of middle ear pressure.

As this complication is rare, we do not consider chronic ear infection to be a specific contraindication to the Trendelenburg position. Instead, we believe that our case is an example of the importance of the anesthesiologist maintaining continued vigilance, not only with monitoring the patient's vital signs but also by direct observation of the patient. The latter is often a challenge because of the presence of redundant and overlapping drapes.

Conflicts of interest None declared.

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