



CLINICAL IMAGES

A simple technique to maintain intraoperative head and neck neutrality

Anthony M.-H. Ho , Gregory Klar , Glenio B. Mizubuti *

Queen's University, Department of Anesthesiology and Perioperative Medicine, Kingston, Canada

Received 16 September 2021; accepted 13 November 2021

Available online 27 November 2021

During laparoscopic cholecystectomy, the left-tilt plus reverse Trendelenburg positioning required can result in the head and neck being turned to an extreme left and/or flexed position (Fig. 1A). In certain upper extremity surgeries, the patient is positioned at the edge of the table and the patient's head is at risk of drifting unnoticed off the edge (Fig. 1B).

Excessive head rotation is potentially harmful. Weintraub and Khoury have shown that major occlusion of the vertebral artery occurs in 56.4% and 13.3% of patients with (mean age 71 years) and without (mean age 66 years) vascular risk factors, respectively, upon maximum head rotation.¹ In adults, Burbridge et al have found that 80% of the internal jugular vein is occluded during head turn of $\sim 55^\circ$, poten-

tially raising intracranial pressure.² Carotid dissection has been reported in a 36-year-old healthy woman clutching her phone between her head and shoulder for 32 minutes.³ One may speculate that carotid compression plus reverse Trendelenburg positioning could compromise cerebral perfusion. Patients with cervical spine pathology may not tolerate head flexion and tilt. Stretching of the contralateral ligaments, muscles, and nerves create strain.

Figure 1C shows how use of the anesthesia circuit holder can maintain the patient's head in a neutral position. Figure 1D shows the same arrangement reinforced to stabilize the head and neck. Finally, the anesthesia circuit holder is shown in Figure 1E.

* Corresponding author.

E-mail: Gleniomizubuti@hotmail.com (G.B. Mizubuti).



Figure 1 Typical head positions during surgery. (A) Significant flexion and left lateral neck/head tilt during typical patient positioning for laparoscopic cholecystectomy (i.e., reverse Trendelenburg with left lateral tilt of the surgical table). In this example, the (optional) pillow/cushion commonly used to support the patient’s head is absent. (B) Patient positioned at the edge of the surgical table as commonly observed in upper extremity surgeries. Notably, the surgical table remains in neutral position, but the patient’s head is at risk of falling off to the side of the surgical table (especially with surgical manipulation) despite the use of a pillow/cushion to support it. Finally, panels (C) and (D) depict the simple use of the anesthesia circuit holder (E) to maintain the patient’s head/neck in neutral position during cholecystectomy (reverse Trendelenburg and steep left lateral tilt of the surgical table) and upper extremity surgery (surgical table in neutral position). Note the use of a clamp (green arrow) to secure the circuit holder against the mattress and/or its covering sheet to prevent it from slipping along with the patient’s head, thereby further stabilizing the head/neck position. Also, a towel (red arrows) is used for providing comfort and to isolate the patient’s face/head from the metallic holder to prevent against electrocautery-induced skin burns.

Conflicts of interest

The authors declare no conflicts of interest.

References

1. Weintraub MI, Khoury A. Critical neck position as an independent risk factor for posterior circulation stroke. A magnetic resonance angiographic analysis. *J Neuroimag.* 1995;5:16–22.
2. Burbridge MA, Min JG, Jaffe RA. Effect of head rotation on jugular vein patency under general anesthesia. *Can J Neuro Sci.* 2019;46:355–7.
3. Mourad J-J, Girerd X, Safar M. Carotid-artery dissection after a prolonged telephone call. *N Engl J Med.* 1977;336:516.