



## Novel technique for positioning children under general anesthesia for ophthalmic YAG laser capsulotomy using the Hug-U-Vac® surgical positioning system

Elizabeth Y. Lee, MD · Desigen Reddy, MD, FRCSC · Kourosh Sabri, MD, FRCSC

Received: 18 June 2020/Revised: 16 July 2020/Accepted: 17 July 2020/Published online: 29 July 2020  
© Canadian Anesthesiologists' Society 2020

### To the Editor,

Posterior capsular opacification (PCO) is a common complication after cataract surgery in children<sup>1</sup> and is commonly described as “scar tissue.” If left untreated, it can cause permanent vision loss in children. Its treatment includes an Nd:YAG laser capsulotomy to create an opening in the thickened posterior capsule. While in adults this procedure can be done in an awake state, children require general anesthesia (GA). The reasons include the significantly greater amount of laser shots required in children and the importance of head stability during the procedure.

We report<sup>A</sup> a case series where a “bean bag”-type Allen® Hug-U-Vac® surgical positioning system (Allen Medical; Acton, MA, USA) was used for positioning children in a seated position under GA. Eleven children with PCO after cataract surgery underwent laser capsulotomy under GA between 3 April 2017 and 25 November 2019. The ages of the six male and five female patients ranged from 3 and 12 yr (median, 7 yr) with weights between 17 kg and 61 kg (median, 20 kg).

An anesthetic technique of parental presence at induction, inhalational induction, intravenous (IV) placement, IV supplementation with propofol, remifentanyl, oral intubation, maintenance with sevoflurane, anti-emetic prophylaxis, fentanyl, and

standard monitoring was used. The patients were then positioned and the air was evacuated from the bean bag that had been placed under the patient prior to GA (Figure A). The patient's head was then placed on the chin rest of the Nd:YAG laser and taped to the forehead rest for stability (Figure B). All contact points between the patient and the laser were cushioned to decrease pressure points. The mean (standard deviation) time for induction of GA was 12.9 (5.3) min. The positioning and laser treatment took 25.1 (10.5) min (range, 15–49 min). There were no anesthetic or ocular complications during the procedure for any of the cases.

Several methods of positioning children for laser capsulotomy under GA have previously been reported.<sup>2</sup> A major concern with lateral decubitus positioning is that the bed has to be raised to maximum height with safety mechanisms such as operating room bed risers removed to fit the laser in proper position.<sup>3</sup> Safety concerns in a case series report of three patients positioned prone with hyperextension of the neck to fit the patient's head on the chin rest included excessive pressure on dependent areas, and temporary disconnection of ventilator tubing and monitors when necessary.<sup>4</sup> It was also described to be labour- and time-intensive. Longmuir *et al.*<sup>5</sup> have previously shown the sitting position to be effective during laser capsulotomy with patients seated in a procedural chair with two nurses stabilizing the patient at the laser. In our series, we successfully positioned patients without extra personnel by using the bean bag and taping the head and tubing to the laser device. We found the bean bag provides adequate support to maintain the upright,

---

E. Y. Lee, MD · K. Sabri, MD, FRCSC (✉) ·  
Department of Ophthalmology, McMaster University, Hamilton,  
ON, Canada  
e-mail: sabrik@mcmaster.ca

D. Reddy, MD, FRCSC  
Department of Anesthesiology, McMaster University, Hamilton,  
ON, Canada

---

<sup>A</sup> The Hamilton Integrated Research Ethics Boards (HiREB) was contacted for approval but decided the study did not require a waiver of consent given its retrospective case series design.



**FIGURE** A) 11-yr-old patient undergoing Nd:YAG laser posterior capsulotomy under general anesthesia. A “bean bag”-type Allen® Hug-U-Vac® positioning system has been placed underneath the patient prior to induction. B) After intubation, the patient is moved to

a sitting position to allow conventional use of the laser. After evacuating the air from the bean bag, the patient is fully supported and all pressure points are protected.

sitting position of patients. The seated position is also beneficial in that the laser can be administered as intended with the surgeon having optimal working distance in an ergonomic position.

**Disclosures** None.

**Funding statement** None.

**Editorial responsibility** This submission was handled by Dr. Hilary P. Grocott, Editor-in-Chief, *Canadian Journal of Anesthesia*.

## References

1. Schaumberg DA, Dana MR, Christen WG, Glynn RJ. A systematic overview of the incidence of posterior capsule opacification. *Ophthalmology* 1998; 105: 1213-21.

2. Atkinson CS, Hiles DA. Treatment of secondary posterior capsular membranes with the Nd:YAG laser in a pediatric population. *Am J Ophthalmol* 1994; 118: 496-501.
3. Kinori M, Jagannathan N, Langguth AM, et al. Pediatric Nd:YAG laser capsulotomy in the operating room: review of 87 cases. *Int J Ophthalmol* 2019; 12: 779-83.
4. Subash M, Horgan SE. Nd:YAG laser capsulotomy in the prone position under general anesthesia. *Ophthalmic Surg Lasers Imaging* 2008; 39: 257-9.
5. Longmuir S, Tittler S, Johnson T, Kitzmann A. Nd:YAG laser capsulotomy under general anesthesia in the sitting position. *J AAPOS* 2013; 17: 417-9.

**Publisher’s Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.