



Surgical and dental considerations in patients with postural tachycardia syndrome



Mohammed Ruzieh^a, Mark Dziuba^b, James P. Hofmann^c, Blair P. Grubb^{c,*}

^a Penn State Heart and Vascular Institute, Hershey, PA, USA

^b University of Toledo, Toledo, OH, USA

^c University of Toledo Medical Center, Toledo, OH, USA

Postural tachycardia syndrome (POTS) is a chronic condition characterized by symptoms of orthostatic intolerance associated with an increase in heart rate (HR) ≥ 30 beat per minute (bpm) in adults within 10 min of standing or upright tilt-table test, in the absence of orthostatic hypotension (Grubb, 2008; Raj, 2013).

At present, there is no consensus on the perioperative management in patients with pre-existing POTS, due to lack of data in this field. Nonetheless, special attention should be drawn to these patients due to their unusual hemodynamic physiology.

Pre-operatively, nil per os (NPO) status that is recommended before surgeries can cause dehydration and worsen orthostatic symptoms. This may be ameliorated with 1–2 L of supplemental IV saline given over 1–2 h prior to surgery.

We recommend continuing baseline POTS medications the morning of surgery. There is a theoretical concern that continuing beta-blockers might worsen hypotension. However, based on our experience in a high-volume center, we found it's safe to continue beta-blockers and other POTS medications without interruption. In patients who are on chronic Fludrocortisone therapy, it's reasonable to monitor for signs of adrenal insufficiency in the peri-operative period. Additionally, in highly symptomatic patients with significant orthostatic blood pressure changes, midodrine can be given while supine as it takes about 30 min or more to have any effect on blood pressure, once it has taken effect we usually do not have patients lie down.

During surgery, hypotension is a significant concern. In a series of 13 POTS patients, three patients developed prolonged intraoperative hypotension, however all had uneventful post-operative courses and no unplanned hospitalizations (Rabbitts et al., 2011). In this series, propofol and thiopental were used as induction anesthesia agents.

We use fluid boluses with crystalloid solutions to improve preload in patients who experience hypotension. In uncomplicated surgeries, majority of patients require 2–3 L of fluid (Rabbitts et al., 2011). In patients with persistent hypotension despite fluid resuscitation, phenylephrine infusion should be used as a first line due to its selective alpha-1 adrenergic activity (Walsh et al., 2008; Stewart et al., 2002). Ephedrine was used successfully in two cases by Rabbitts et al. (2011), nonetheless, combined alpha-beta agonists may worsen tachycardia

specially in patients with hyperadrenergic POTS features. Vasopressin analogues could also be used as an alternative.

There is no evidence to support one anesthetic agent over another. Similarly, no form of anesthesia was found to be superior to others in POTS patients. Regarding neuraxial anesthesia, hypovolemia is a contraindication and adequate IV hydration and preload augmentation should be performed with all patients, particularly with POTS patients.

When using local anesthetic, epinephrine might cause tachycardia and should be used in caution. In the subgroup of patients with Ehlers-Danlos syndrome (EDS), there might be a lack of response to local anesthetics, or the response might be of shorter duration (Hakim et al., 2005). These patients should be thoroughly and continuously monitored for symptoms and signs of adequate analgesia, as repeat administration of local anesthetics might be required.

Post-operatively, causes of tachycardia such as hypovolemia, anemia, hyperthermia, pain, anxiety, or pulmonary embolism should be considered and treated in the appropriate clinical settings. In the post-anesthesia care unit (PACU), patients should be closely monitored for symptoms and signs of hemodynamic instability, including routine orthostatic vitals check. There is no need for routine hospitalization or intensive care unit (ICU) admission unless deemed necessary by other medical conditions (Rabbitts et al., 2011; McHaourab et al., 2000).

EDS is a fairly common comorbid condition in POTS patients but may be underdiagnosed. This group of patients is at higher risk of poor wound healing and excessive bleeding. Overall, a conservative approach and reservation of invasive treatment, unless necessary, is recommended. Prior surgical and hemostasis history should be reviewed. Medications that reduce platelet function or coagulation should be used in caution in the perioperative settings. Furthermore, joint care is of particular importance due to higher incidence of joint instability and dislocations.

Finally, POTS patients are more prone to deconditioning with prolonged immobilization (such as that seen after orthopedic procedure). Early physical therapy and rehabilitation are necessary to prevent deconditioning in patients with complicated post-operative courses who require prolonged hospitalization.

In summary, POTS patients can safely undergo surgery. Extra care

* Corresponding author at: Division of Cardiovascular Medicine, The University of Toledo Medical Center, 3000 Arlington Ave., Toledo, OH 43614, USA.
E-mail address: Blair.Grubb@utoledo.edu (B.P. Grubb).

and monitoring is required, and early mobilization postoperatively is vital to prevent deconditioning.

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