Improvement in Patient Safety through "Irrigation Time-Outs" During TURP Procedures

Deiling BL, DO1, Kilmartin E, MD2, Kennedy TL, MD2

Department of Anesthesiology, Sidney Kimmel Medical College at Thomas Jefferson University, Philadelphia, PA, USA

1 Thomas Jefferson University Hospital
2 Sidney Kimmel Medical College

BACKGROUND AND PROBLEM

Transurethral resection of the prostate (TURP) is the standard of care treatment for the most common non-malignant disorder of the prostate, benign prostatic hyperplasia. One consequence of TURP procedures is the potential for large volumes of systemic absorption of hypotonic irrigation causing a symptomatic dilutional hyponatremia. TURP syndrome is a constellation of symptoms due to central nervous and circulatory system changes, along with electrolyte and acid-base imbalances due to absorption of irrigating fluid. Mild to moderate TURP syndrome has been reported to occur in 1-8% of TURP procedures. Severe TURP syndrome is more rare, but can necessitate ICU admission.

Also, absorption of isotonic normal saline solution (NSS) irrigation can cause a hypervolemic, hyperchloremic metabolic acidosis, referred to as NSS overload. While these endoscopic procedures require the use of irrigation for optimal surgical field visualization, dilating prostatic mucosal surfaces and washing away debris and blood, it also causes unique challenges to both the anesthesiologist and surgeon. The consequences of irrigation depend of the tonicity of irrigant used and volume of fluid absorption, which correlate with duration of procedure and size of prostate gland resected. We have had three cases recently where irrigation fluid led to complications: one TURP syndrome and two cases of normal saline. [1,2]

OBJECTIVE

During any surgical procedure, clear and standardized communication among surgeons, anesthesiologists and operating room nursing staff is a necessity for all aspects of patient safety. During TURP procedures, the perioperative staff must alert team members of the signs and predictors for the potential of TURP syndrome or NSS overload. The goal of our quality improvement project is to increase communication and diagnostic actions based on irrigation fluid amounts among surgeons, anesthesiologists, and the operating room nurses in order to decrease complications in TURP patients at Jefferson over the next six months.

THE CHANGE

We plan to obtain our objective with the implementation of "Irrigation Time-Outs" during TURP procedures. [3,4]

"IRRIGATION TIME-OUTS":

1.5 % Glycine in Water Irrigation or Water Irrigation:

* After the initial 9 liters of irrigation and for every subsequent 6 liters of irrigation, the circulating OR nurse will initiate a time out.
* At the first 9 liters of irrigation, a venous OR panel will be sent.
    * A venous OR panel will be sent for every 6L of irrigation after the first 9L

Normal Saline Solution (NSS) Irrigation:

*After the initial 42 liters of irrigation and for every subsequent 33 liters of irrigation, the circulating OR nurse will initiate a time out.
* At the first 42 liters of irrigation, a venous OR panel will be sent.
    *A venous OR panel will be sent for every 33L of irrigation after the first 42L

ROLE OF STAFF IN "IRRIGATION TIME-OUTS:

Circulating OR Nurse

* Initiate irrigation time out based on set irrigation parameters listed above
* Announce type and amount of fluid irrigation used
* Announce any changes to height of irrigation bags
* Announce duration of surgery until that point
* Ensure irrigation fluid warmer is available if needed

Anesthesiologist

* Announce temperature status of patient
* Discuss warmed irrigation fluid if needed
* Announce any physical exam findings of fluid overload/edema
* Announce labs findings of acid-base or electrolyte disturbances

Surgeon

* Update estimated duration of surgery remaining
* Describe any technical issues that would prolong surgery or cause a change in type of irrigation fluid (i.e monopolar vs bipolar electrocautery)
* If signs and symptoms of TURP syndrome or NSS overload, discuss the potential of a staged procedure

OUTCOME AND DATA ANALYSIS

We plan to measure the patient safety outcomes of this protocol by queuing the urology billing data for patients that underwent TURPs after the institution of the time-out. We would further examine specific cases of negative patient outcomes during TURP procedures, such as occurrence of TURP syndrome, NSS overload, and prolonged post-op intubation. Our goal is to better understand the potential negative outcomes during TURP procedures and how our irrigation time out can better predict the likelihood of these negative outcomes.

Using the Plan-Do-Study-Act Cycle model, we plan to identify process measures by creating an online survey at the three month mark. We will and the involved parties including urology OR nurses, urology surgeons/residents and urology anesthesia providers. The survey would allow us to evaluate the adherence and effectiveness of the "Irrigation Time Out, and modify it based on participant feedback.

PROJECT EVALUATION

We plan to evaluate every case of TURP syndrome and NSS overload during the first year and discover ways that we can continue to improve patient outcomes by decreasing amount of irrigation fluid used during the procedure, identifying complicated cases early, and discussing the potential need for a stage procedure. By identifying potentially complicated cases pre-operatively, we can improve communication between Urology and Anesthesia teams to help avoid negative outcomes.

SUSTAINED IMPROVEMENT

Based on the results of "Irrigation Time-Outs" in TURPs, we plan to apply our project to other surgical specialties that require using irrigation fluid.

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