

# Impact of a Blood Conservation Bundle on Perioperative Transfusion Rates During Myomectomy

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## BACKGROUND/CONTEXT

Uterine fibroids can result in significant morbidity due to heavy menstrual bleeding, bulk symptoms, and infertility. In patients who wish to conserve their uterus, fibroids are removed via myomectomy. Due to the vascular nature of fibroids, myomectomy can result in significant blood loss, often necessitating intraoperative blood transfusions. Surgical bleeding and intraoperative transfusion are correlated with increased peri-operative morbidity and mortality, as well as other long-term complications which may affect future pregnancies in this population.

## AIM/OBJECTIVES

An intraoperative Blood Conservation Bundle (BCB) [Fig.1] was developed as a standardized approach to decreasing blood loss during myomectomy. This study aimed to introduce the BCB into clinical practice and assess its impact on intraoperative blood loss and transfusion rates.

## MEASURES

Primary outcome measures included estimated intraoperative blood loss and transfusion rates. Process measures included bundle uptake rates and balancing measures were perioperative complication rates and readmission rates in order to ensure that introduction of the bundle did not negatively impact patient safety.

## IMPROVEMENT/INNOVATION/CHANGE CONCEPTS

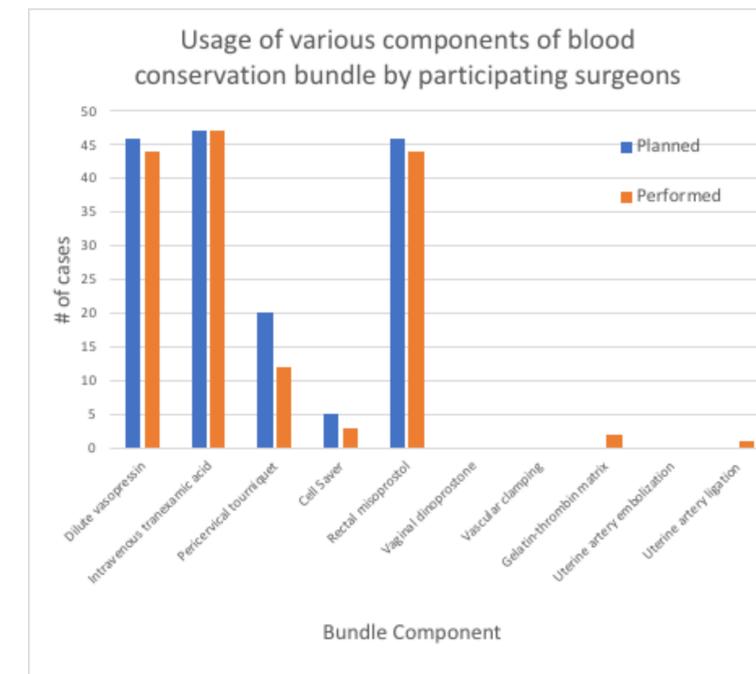
The BCB is a physical checklist attached to the patient chart consisting of evidence-based medical and surgical interventions, it served as both a visual reminder and cognitive guide for the surgical team. The initiative was introduced in October 2018 and data were collected prospectively during a 12-month period. Data were compared to a historical control group from the 24-month period prior to BCB introduction.

MYOMECTOMY BLOOD CONSERVATION BUNDLE		
As part of an ongoing quality improvement study, please consider utilizing the interventions below aimed at reducing the rate of intraoperative blood transfusions during myomectomy		
Intraoperative interventions for ALL patients		
Intervention	Planned	Performed
Tranexamic acid - (1g IV prior to surgery)	<input type="checkbox"/>	<input type="checkbox"/>
Dilute vasopressin - (20IU intramyoma)	<input type="checkbox"/>	<input type="checkbox"/>
Pericervical tourniquet - (suture or Foley)	<input type="checkbox"/>	<input type="checkbox"/>
Restrictive RBC transfusion - (Hb <70 g/L or EBL >1000 mL)	<input type="checkbox"/>	<input type="checkbox"/>
Cell Saver	<input type="checkbox"/>	<input type="checkbox"/>
Intraoperative interventions for HIGH RISK patients		
Intervention	Planned	Performed
MEDICAL		
Misoprostol (rectal) - (600mcg PR)	<input type="checkbox"/>	<input type="checkbox"/>
Dinoprostone (vaginal) - (20mg intravaginally)	<input type="checkbox"/>	<input type="checkbox"/>
SURGICAL		
Vascular clamping	<input type="checkbox"/>	<input type="checkbox"/>
Gelatin-thrombin matrix	<input type="checkbox"/>	<input type="checkbox"/>
Uterine artery embolization	<input type="checkbox"/>	<input type="checkbox"/>
Uterine artery ligation	<input type="checkbox"/>	<input type="checkbox"/>

Figure 1. Blood Conservation Bundle checklist components

Variable	Pre-intervention	Post-intervention	p-value
Time period, months	24	12	
Patients, n	134	52	
Age, years, mean (± SD)	36.5 (±5.6)	36 (±5.1)	0.576
ASA class, median (range)	2 (1-3)	2 (1-3)	
Surgical Approach, n, %			
Open	90 (67.2)	33 (63.5)	0.632
Robotic	31 (23.1)	10 (19.2)	0.564
Laparoscopic	13 (9.7)	9 (17.3)	0.149
Pre-operative hemoglobin, g/L (± SD)	125 (±13.3)	126 (±12.6)	0.641
Pre-operative anemia, n (%)	44 (32.8)	14 (26.9)	0.435
Pre-operative medical optimization, n (%)	73 (54.4)	40 (76.9)	<b>0.005</b>

Table 1. Comparison of patient demographic information and pre-operative variables of patients undergoing myomectomy prior to and following introduction of blood conservation bundle.



Variable	Pre-intervention	Post-intervention	p-value
EBL, mL, mean (± SD)	491 (± 440)	350 (± 255)	<b>0.031</b>
Transfusion rate, n (%)	21 (15.7)	4 (7.7)	0.152
Delta hemoglobin, g/L, mean (± SD)	-28 (± 13.0)	-23 (± 11.4)	<b>0.046</b>
Nadir hemoglobin, g/L, mean (± SD)	97 (± 14.7)	102 (± 14.7)	<b>0.039</b>
Intra-operative complications, n (%)	5 (3.7)	2 (3.8)	0.971
Post-operative complications, n (%)	3 (2.2)	1 (1.9)	0.894
Re-admissions, n (%)	2 (1.5)	0 (0)	0.376

Table 2. Surgical outcomes for patients undergoing myomectomy prior to and following introduction of blood conservation bundle.

## IMPACT/RESULTS

In the pre-BCB period, 134 myomectomies (90 open, 31 robotic and 13 laparoscopic) were performed and during our study period 52 myomectomies (33 open, 10 robotic and 9 laparoscopic) were performed. There was a decrease in transfusion rate from 15.7% (21/134) to 7.7% (4/52) following introduction of the BCB, however this was not significant (p=.152). Mean EBL was lower post-intervention [491 +/- 440mL vs. 350 +/- 255mL, p<.05] as was the mean delta hemoglobin (ΔHb) [-28 +/- 13.0g/L vs. -23 +/- 11.4g/L, p<.05]. The checklist was used in 92.3% of cases (48/52). There was no difference in intraoperative or postoperative complications or readmission rate.

## DISCUSSION/LESSONS LEARNED

Best practice care bundles can improve knowledge translation of guidelines into care delivery. The introduction of a BCB was successful in safely reducing intraoperative blood loss and transfusion rates during myomectomy. The BCB is validated as a simple, effective tool that can be easily adopted by gynecologic surgeons to guide intraoperative decision-making.