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Additional Laparotomy Sponges Requested During Cesarean Delivery: 'Early Warning' Associated with Postpartum Hemorrhage

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Introduction

Postpartum hemorrhage (PPH)

- Leading cause of maternal morbidity and mortality throughout the world[1,2]
- Defined as estimated quantitative blood loss (QBL) greater than 1,000 mL after cesarean delivery (CD)[3]
- Clinical signs of hypovolemia can be difficult to identify due to physiologic changes in pregnancy[3]
- QBL is often not available until after CD and when timing of interventions is suboptimal

Objective:

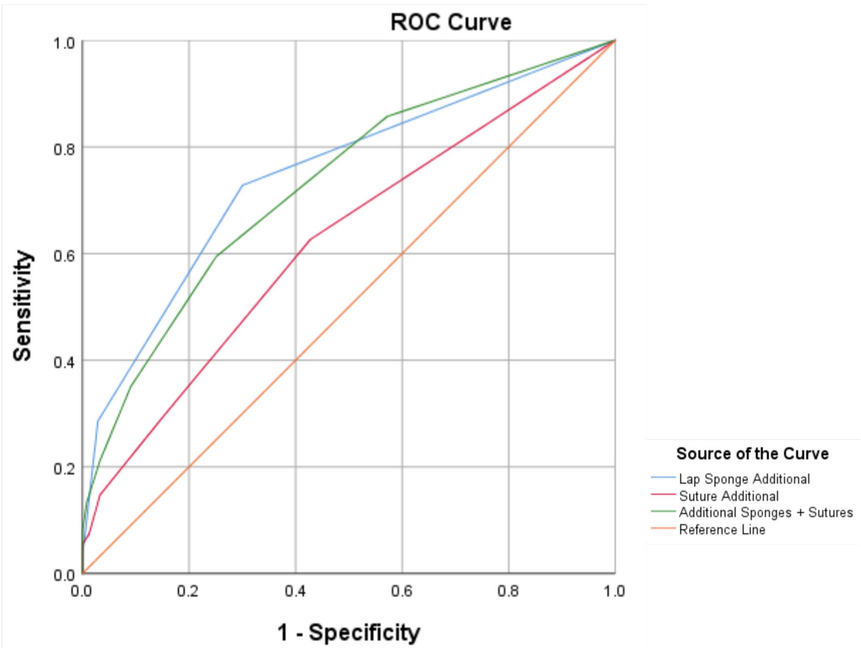
- To determine if there is a relationship between quantitative blood loss (QBL) and additional suture and/or laparotomy sponge counts during Cesarean Delivery (CD)

Study Design

- Retrospective case-control study, 1/2016-6/2017 at a single tertiary care center
- Pre- and post-operative laparotomy sponge & suture counts during CD compared in those with QBL >1,000 mL vs 1:1 matched control group with QBL <1,000 mL
- Pearson's correlation, logistic regression and ROC curves used to determine if there was an association with PPH and any combination of the following:
  - Laparotomy sponges
  - Sutures
  - Uterotonics (carboprost, methylergonovine, or misoprostol)

Results

Request for Additional	PPH (N = 230)	No PPH (N = 230)	OR (95% CI)
Laparotomy sponge only	165 (71.7%)	66 (28.3%)	6.3 (4.2 to 9.5)
Uterotonic only	69 (30.0%)	15 (6.5%)	6.1 (3.4 to 11.1)
Suture only	140 (60.9%)	100 (43.5%)	2.0 (1.4 to 2.9)
Laparotomy sponge and uterotonic	44 (19.1%)	5 (2.2%)	10.6 (4.1 to 27.4)
Laparotomy sponge and suture and uterotonic	28 (12.2%)	3 (1.3%)	10.5 (3.1 to 35.0)
Either sponge or suture and uterotonic	57 (24.8%)	12 (5.2%)	6.0 (3.1 to 11.5)
Sponge and suture	110 (47.8%)	36 (15.7%)	4.9 (3.2 to 7.7)
Suture and uterotonic	41 (17.8%)	10 (4.3%)	4.8 (2.3 to 9.8)
Sponge or suture	195 (84.8%)	130 (56.5%)	4.3 (2.7 to 6.7)



Results

- Of 7512 total deliveries, 2554 (33.9%) delivered by CD and 460 (18%) had QBL >1000mL.
- 230/460 (50%) pre- and post- operative laparotomy and sponge count sheets available for analysis
- Patients with PPH were more likely to require blood transfusions (3.4% vs 0%, p=0.001)
- Additional laparotomy sponges were most likely to be associated with PPH (Table)
- For every unit of additional laparotomy sponge or suture requested, the odds of PPH increased by 1.83 (95% CI 1.6-2.2)
- Additional laparotomy sponge requests had the strongest association with PPH when analyzed by ROC curves (Figure)

Conclusion

- Of the scenarios studied:
  - Any additional laparotomy sponge use at CD was most associated with QBL >1000
  - This information may provide the surgeon a real time 'early warning' sign for excessive blood loss to guide treatment and surveillance of postpartum hemorrhage.