

The Pannus Retention System and Hypotension during Cesarean Section

An Observational Study

SOAP 2026 Annual Meeting

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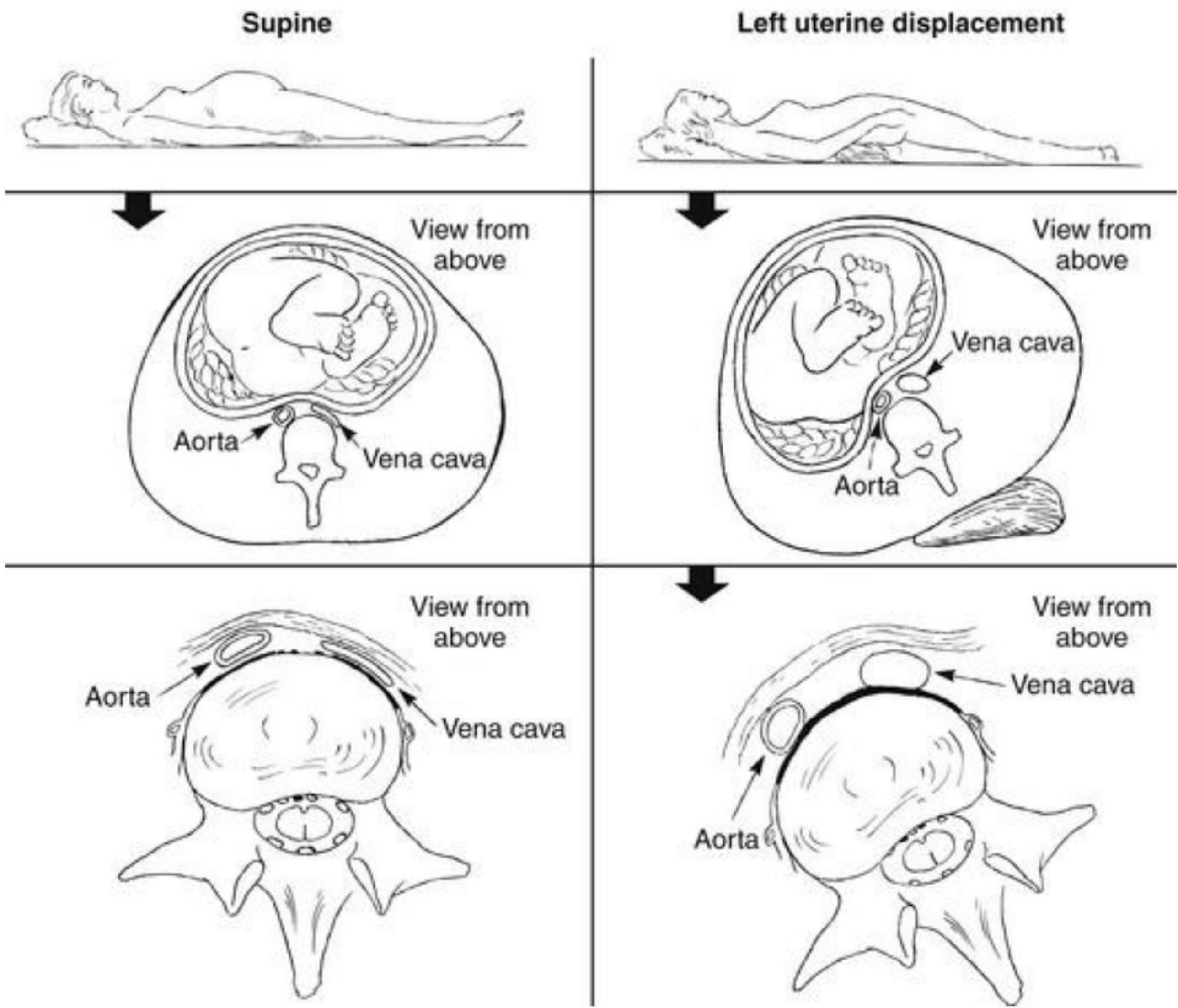
BACKGROUND

What is the Pannus Retention System (PRS?)

Pannus retraction moves excess abdominal tissue during cesarean section to improve surgical access and visualization in high BMI patients.



PRS system in clinical use: adhesive pads and adjustable straps retract the pannus



Aortocaval compression: supine vs. left uterine displacement

Clinical Concern

The PRS pulls up and tightens abdominal contents, potentially worsening aortocaval compression and supine hypotension.

Supporting Evidence

- Reverse Trendelenburg positioning has been shown to reduce aortocaval compression in obese pregnant patients (IJOA 2016).
- Higher pregestational BMI is an established risk factor for post-spinal hypotension during cesarean delivery (BJOA 2011).

Hypothesis

PRS application may cause clinically significant decreases in systolic blood pressure during cesarean section under spinal anesthesia.



Observational Study | 17 Patients | Elective Cesarean Section | Average BMI: 42.6 (range 29.7–56)



Anesthesia Protocol

Spinal anesthesia:

- Hyperbaric bupivacaine 1.8 mL
- Fentanyl 15 mcg
- Morphine 150 mcg

Anesthetic level: T4–T6

Phenylephrine infusion:

- 50–70 mcg/minute



Stability Criteria

Before PRS application:

- Final anesthetic level established
- Urinary catheterization completed
- 2 consecutive SBP readings stable and within 10% of each other

Only then was the surgeon allowed to apply the PRS system.



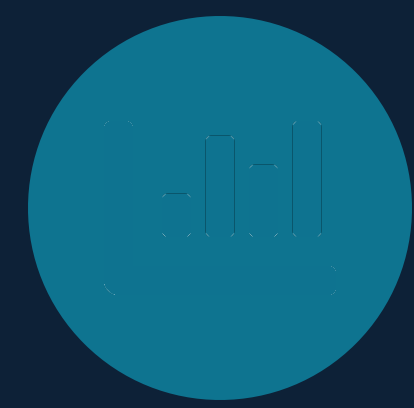
BP Measurement

Primary outcome:

Change in systolic blood pressure (SBP) after PRS application

Measurement timepoints:

- Baseline: SBP immediately prior to application
- 1 minute post-application
- 3 minutes post-application



RESULTS

88%

of patients had SBP drop

16.2

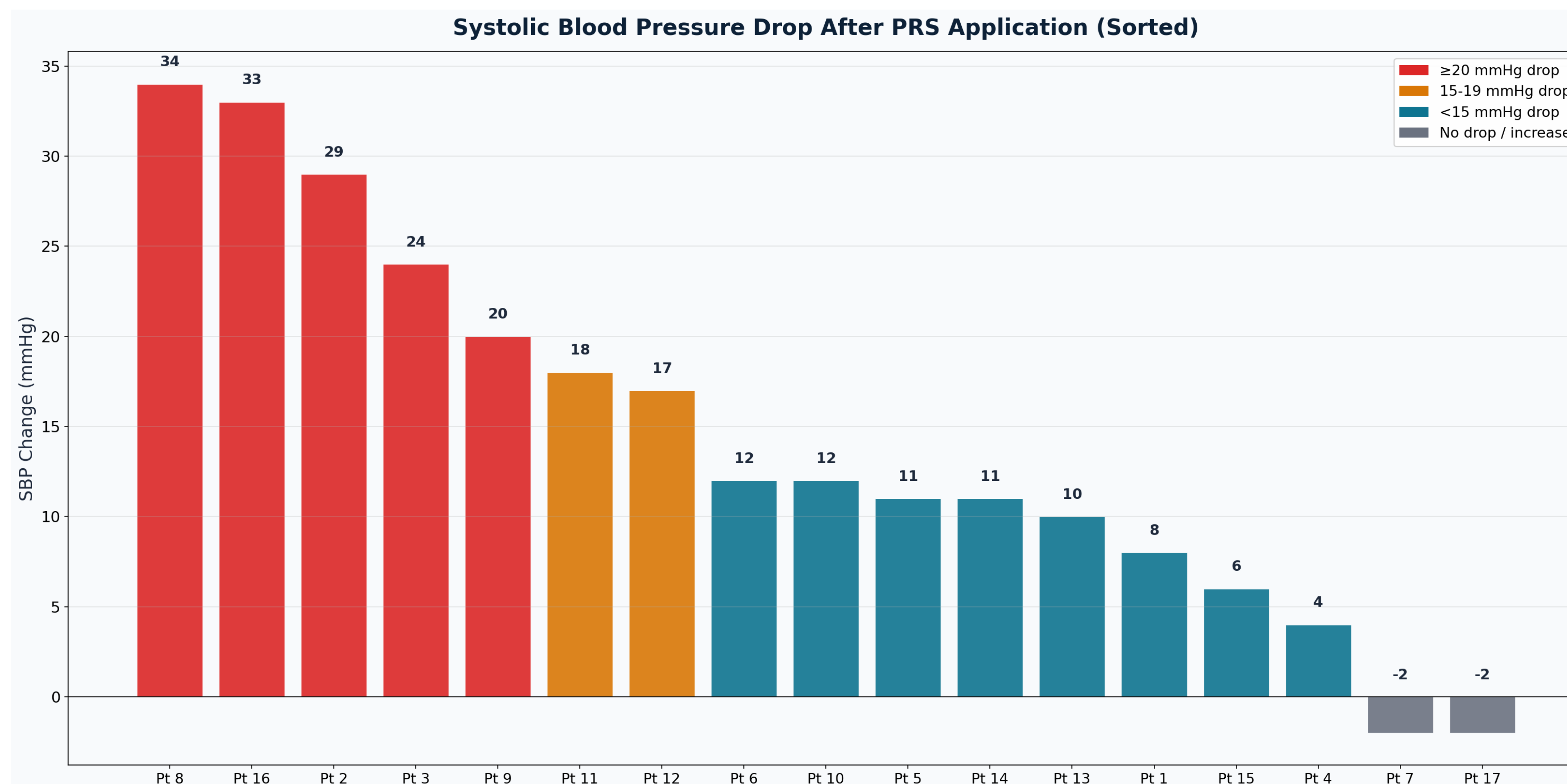
mmHg average
SBP decrease

23%

had $\geq 20\%$ drop
(4 patients)

29%

dropped below
100 mmHg (5 patients)



Key Observations

- Diastolic BP and MAP followed similar patterns (average drops of 10.5 and 9.9 mmHg)
- Two patients had no drop or a slight increase in blood pressure after PRS application
- All significant drops in BP were easily managed with boluses of phenylephrine or infusion rate adjustments.

No association was observed between greater BMI and severity of decrease in SBP.

Baseline SBP showed no correlation with drop magnitude, suggesting BP changes were attributable to PRS application rather than pre-existing hemodynamic status



CONCLUSION AND DISCUSSION

The PRS system can be safely used during cesarean section provided the anesthesiologist is aware of the potential for significant BP drops and the need for adjustment to vasopressor therapy.

Clinical Recommendations

Retraction straps should not be tightened in a patient with hypotension or borderline blood pressure until stabilized to an acceptable range.

Anesthesiologists should anticipate the potential for significant BP drops when the PRS is applied.

Vasopressor therapy (phenylephrine boluses or infusion rate adjustments) should be readily available and promptly administered.

Blood pressure monitoring should be frequent around the time of PRS application.

Discussion

The mechanism likely involves increased aortocaval compression as the pannus is retracted upward and tightened against the abdominal contents.

88% of patients experienced some degree of SBP drop, suggesting this is a predictable physiological response.

All hypotensive episodes were easily managed, supporting the safety of PRS use with appropriate vigilance.

Concordant drops in DBP and MAP (avg 10.5 and 9.9 mmHg) reinforce the validity of the SBP findings across hemodynamic parameters.

The absence of correlation between baseline SBP and drop magnitude ($r = 0.055$) suggests BP changes were attributable to PRS application rather than baseline hemodynamics.