

## Changes in Perfusion Index after Spinal Anesthesia

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### Background

Spinal anesthesia causes a sensory as well as a sympathetic block. The latter induces local vasodilation, which results in increase in skin temperature and blood flow of the legs. Perfusion index (PI) as a new index is calculated from pulse oximeter waveforms. The index has been used as a parameter to evaluate the circulatory state. We investigated changes in PI at the finger, toe and groin after spinal anesthesia.

### Methods

Twenty patients (aged 53-77 yr) undergoing endoscopic urologic procedures with spinal anesthesia were enrolled in this study. A pulse oximeter (Radical-7, Masimo Co., Irvine, USA) was applied to the index finger of one hand and the second toe of the downside foot in the lateral position (n=15). In a separate group, the pulse oximeter was applied to the second toe of the foot and groin (n=5). In the lateral position, patients received 10-12 mg of hyperbaric bupivacaine through a 25-gauge spinal needle. Patients were placed in the supine position immediately after withdrawing the spinal needle. PI calculated from Radical-7 was recorded, and maximum cephalad sensory blockade to cold was measured. Fifteen minutes after spinal anesthesia, patients were placed in the lithotomy position. PI was monitored continuously and the lithotomy position was kept throughout the surgery. Changes in PI were expressed as percent changes over baseline values.

### Results

The median anesthesia levels checked by the cold test at 5 min and 15 min after spinal anesthesia were T10 (range, T6-T12) and T5 (range, T4-T11), respectively. PI at the toe increased soon after induction of spinal anesthesia and reach a plateau within 5 min. In contrast, PI at the finger and at groin did not change. Vasopressors were not administered because blood pressure was maintained within 20 % of baseline.

### Conclusion

PI at the toe changes quickly in response to vasodilation after spinal anesthesia, whereas PI at the finger and groin remains constant. The results suggest that PI is useful for evaluating the circulatory state after spinal anesthesia.

### Figure 1.

Changes in perfusion index (PI) after spinal anesthesia at the finger, toe, and the groin measured by Radical-7 pulse CO-oximeters (Masimo Co., Irvine, CA). Data are expressed as means  $\pm$  SD.

