Volatile Anesthesia or TIVA? Any Differences for Changes in Cerebral Oxygen Saturation in Steep Trendelenburg Position with Pneumoperitoneum or Beach- Chair Position

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Introduction: The robotic-assisted laparoscopic prostatectomy (RALP) needs patients be placed in steep Trendelenburg position with pneumoperitoneum (TP position). On the other hand, the beach-chair position (BC position) during arthroscopic shoulder surgery (SS) requires the sitting position (extreme head up). We hypothesized that cerebral oxygen saturation measured using near infrared spectroscopy (rSO_2 by INVOS 5100C) increases in TP position and decreases in BC position and evaluated differences seen with volatile anesthesia or TIVA technique.

Patients and Methods: After obtaining IRB approval and written informed consents, we recruited patients who underwent RALP or SS. Exclusion criterion was a history of cerebrovascular disease. During surgery, general anesthesia was maintained at bispectral index of 40–60 with desflurane (volatile anesthesia) or TIVA. Ventilation was maintained with 45% oxygen and air to obtain an end-tidal carbon dioxide tension of around 35–40 mmHg. Systolic blood pressure, measured by a transducer at the cardiac level, was maintained around 130 mmHg. Before anesthesia induction, rSO_2 sensors were applied to the right and left forehead and lower legs.

Results: We so far, evaluated 26 of RALP and 15 of SS patients and found that rSO_2 did not change in TP position but decreased in BC position (Figure 1). There were NO differences in changes in rSO_2 between the anesthesia techniques, volatile anesthesia or TIVA. In addition, there were no significant neurogenic complications in any of the patients, even in those with low rSO_2 during surgery in BC position.

Discussion and Conclusion:
Interpretation of rSO_2 changes during general anesthesia in RALP or SS remains controversial. Because what percentage of reduction of rSO_2 would be

clinically significant is depends on multiple factors including individual patient characteristics and stress of surgery. Nonetheless, we confirmed in this small study that the TP position could be no significant influence for the cerebral oxygenation but the BC position would decrease it regardless of the anesthesia technique, volatile anesthesia or TIVA.

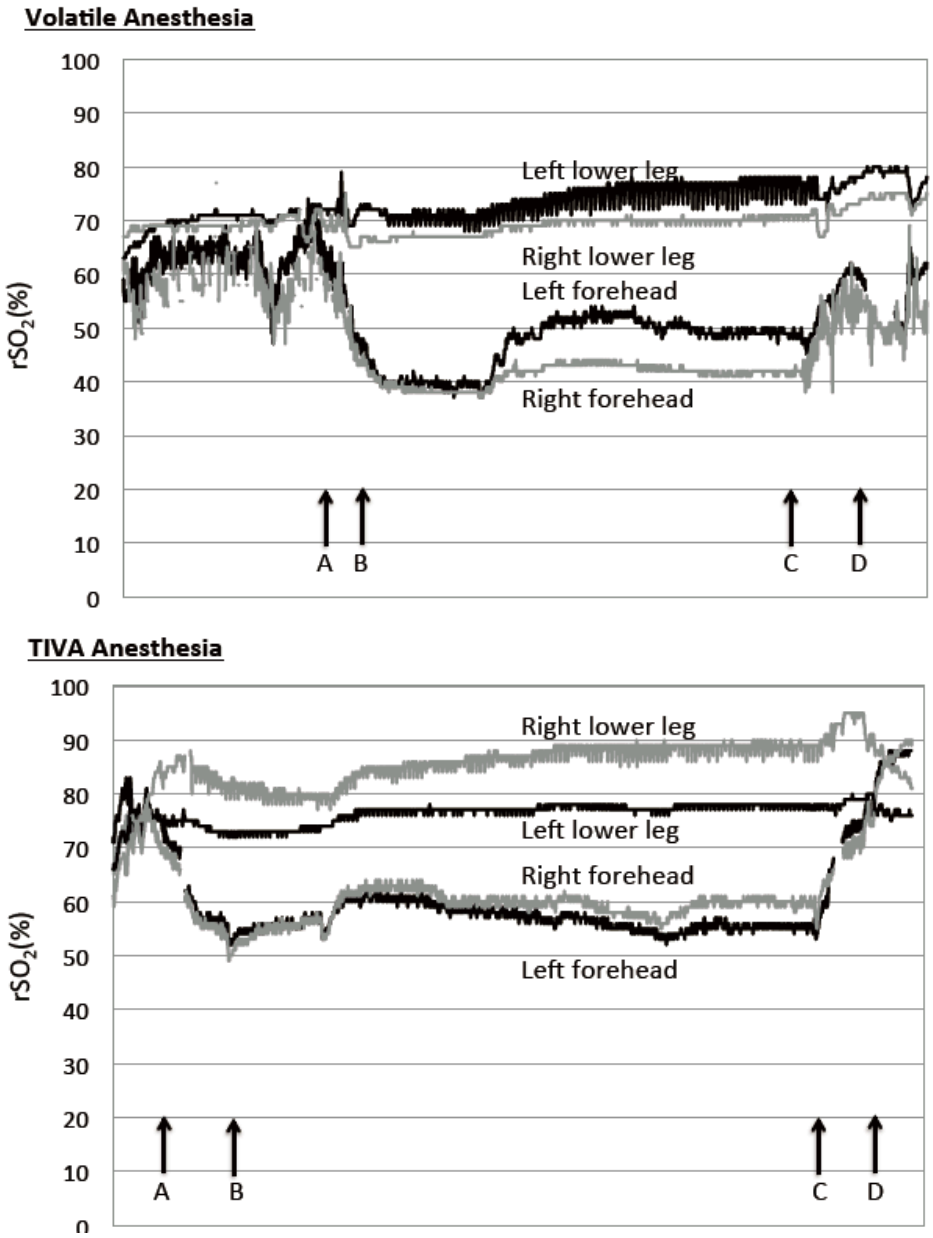

Figure 1. Changes of rSO_2 in beach-chair (BC) position

A: placing the patient in BC position B: BC position achieved

C: end of operation D: return to supine position