

Intrathecal Catheter for Urgent Hip Surgery in Two Patients with Severe Aortic Stenosis

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Introduction

- ❖ Aortic stenosis (AS) is a common lesion of the aortic valve that places patients at higher risk of perioperative cardiovascular events [1] and can pose an intraoperative challenge to anesthesiologists.
- ❖ The lesion is characterized by left ventricular outflow obstruction with subsequent left ventricular hypertrophy and increased myocardial oxygen demand.
- ❖ The major tenets of anesthetic management for patients with AS include maintaining cardiac output and myocardial perfusion by optimizing systemic vascular resistance (SVR), preload, and normal sinus rhythm [2].
- ❖ Because of the peripheral sympathectomy caused by neuraxial anesthesia with resultant decrease in SVR and preload, these techniques have traditionally been considered contraindicated in these patients [2].
- ❖ However, general anesthesia (GA) can also cause significant hemodynamic fluctuations, and neuraxial anesthesia has been found to have benefits over GA in patient populations such as those undergoing hip surgery [3].

Here we describe the successful use of continuous intrathecal anesthesia in two severe AS patients undergoing orthopedic surgery.

Case 1

A 92-year-old 48.9kg female with a history of asthma, paroxysmal atrial fibrillation, and AS presented to the emergency department following a mechanical fall with a displaced femoral neck fracture.

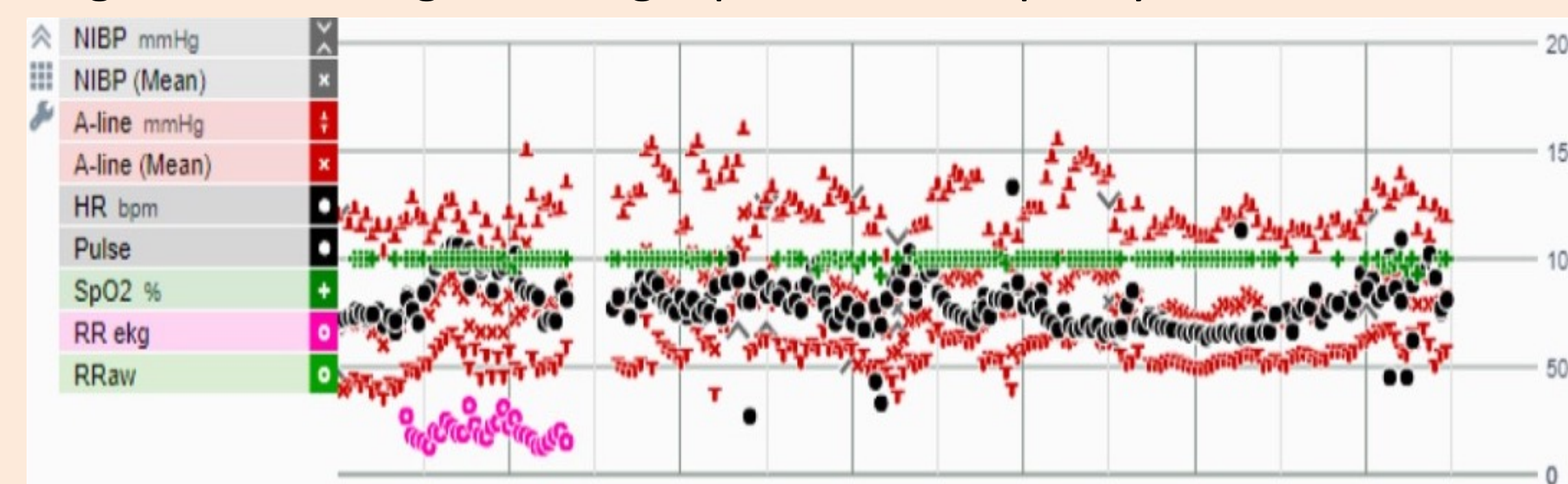
Underwent BAV for severe AS:

Pre-BAV	Post-BAV
AVA 0.73 cm ²	AVA 0.76 cm ²
MG 32 mmHg	MG 28 mmHg
Vmax 4 m/s	Vmax 3.7 m/s

Underwent hip hemiarthroplasty:

- Radial arterial line placed
- Single shot fascia iliaca block to facilitate positioning as well as for post-operative pain
- **Intrathecal catheter inserted at L4-L5 dosed with 0.5% Bupivacaine at 0.5 mL increments over the course of approximately 30 min. for a total dose of 2.5 mL**
- Sedation provided with propofol infusion at 30 mcg/kg/min
- Blood pressure maintained with phenylephrine infusion at 20-40 mcg/min
- Intrathecal catheter removed at end of procedure

Figure 1: Vital signs during hip hemiarthroplasty



Discharged on POD 3 following an uneventful post-operative hospital course.

Case 2

A 94-year-old 77.1kg female with a history of hypertension and AS presented to the emergency department following a mechanical fall with a periprosthetic left femur fracture. Of note, the patient previously presented 6 months prior with a right spiral femur fracture and underwent ORIF under continuous intrathecal anesthesia following presurgical BAV

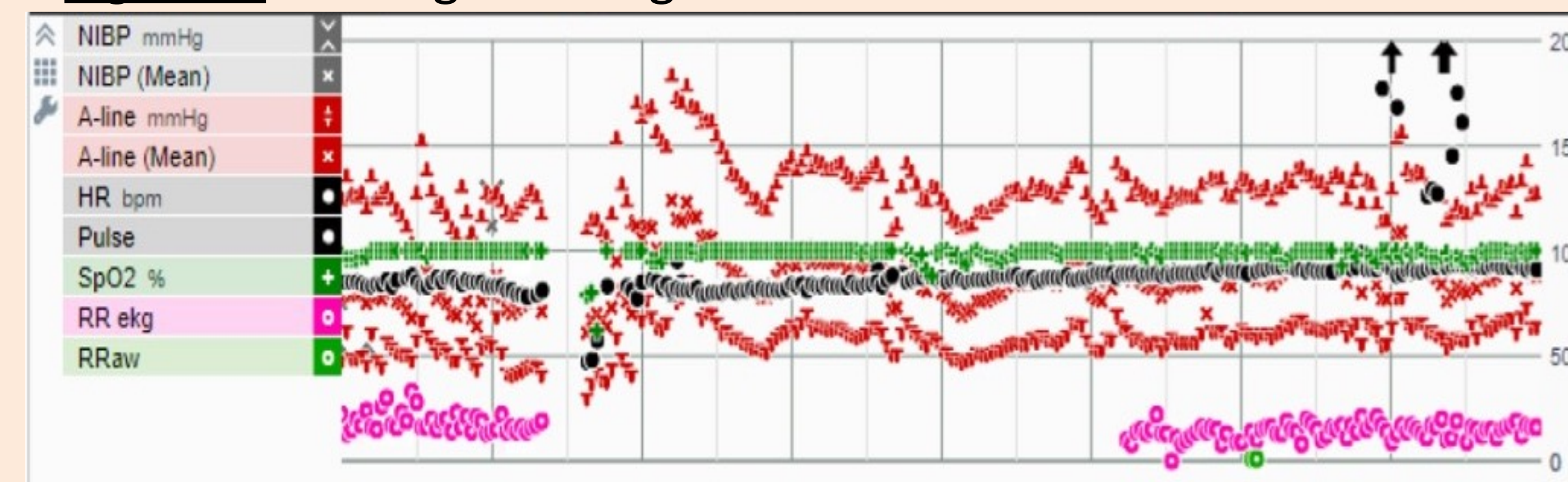
Underwent BAV for severe AS:

Pre-BAV	Post-BAV
AVA 0.59 cm ²	AVA 0.84 cm ²
MG 36 mmHg	MG 26 mmHg
Vmax 3.8 m/s	Vmax 3.1 m/s

Underwent ORIF of femur:

- Radial arterial line placed
- Femoral block and catheter placed to facilitate positioning as well as for post-operative pain
- **Intrathecal catheter inserted at L3-L4 dosed with 0.5% Bupivacaine at 0.5 mL increments over the course of approximately 30 min. for a total dose of 2.5 mL**
- Sedation provided with propofol infusion at 40 mcg/kg/min
- Blood pressure maintained with phenylephrine infusion at 40-60 mcg/min
- Intrathecal catheter removed at end of procedure
- Femoral nerve catheter discontinued on POD 2

Figure 2: Vital signs during ORIF of femur



Discharged on POD 3 following an uneventful post-operative hospital course.

Discussion

- ✓ It has traditionally been taught that neuraxial anesthesia is contraindicated in patients with AS due to the risk of hypotension [2].
- ✓ A sparse but growing number of cases have previously described patients with severe AS successfully undergoing surgery with neuraxial anesthesia [4], and a recent retrospective study has shown that the use of spinal anesthesia in AS patients was not associated with adverse perioperative outcomes [5].
- ✓ At our institution, we routinely use continuous intrathecal anesthesia for hip fracture repair in patients with AS.
- ✓ The cases reported here demonstrate two such patients who presented with AS considered severe enough that intervention was recommended prior to urgent surgery.
- ✓ Our experience suggests that slow and judicious dosing of a continuous intrathecal catheter with careful monitoring and hemodynamic support can produce a dense neuraxial block for orthopedic surgery with minimal fluctuations in hemodynamics even in patients with severe AS.
- ✓ **We hope to demonstrate continuous intrathecal anesthesia as a viable and even favorable alternative to general anesthesia in the perioperative management of patients with AS.**

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