The Anesthesiologist

Case Report

Combined Spinal-Epidural Anaesthesia for Femoral Amputation in a 91yrs Old Patient with Asymptomatic Severe Aortic Stenosis: A Case Report

Nielsen PT[1], De Brun Mangs S[2], Gonzalez MV[2] and Howes J[1]*

[1]Department of Anaesthesia & Critical Care, Hull University Teaching Hospitals NHS Trust, UK

[2]Department of Anaesthesia & Critical Care, Vasteras Central Hospital, Sigtunagatan, Sweden

Abstract

Aortic Stenosis (AS) is significant risk factor for cardiac complications during non cardiac surgery. The prevalence of AS increases with age, it averages 0.2% in the 50 years to 59 years cohort, and increases to 9.8% in the 80 years to 89 years cohort. Historically the majority of patients with severe AS receiving aortic valve replacement exhibited a high transvalvular pressure gradient, with variable left ventricular hypertrophy, and normal or reduced Left Ventricular Ejection Fraction (LVEF). Populations with a lower gradient and severe aortic stenosis are increasingly recognized in situations of low flow. This is characterized by either an impaired ejection fraction (classical low flow-low gradient aortic stenosis) or a normal ejection fraction (paradoxical low flow-low gradient aortic stenosis).

AS causes left ventricular pressure overload due to outflow obstruction resulting in an increased working load. Over time this causes a LV hypertrophy, reduced diastolic compliance and increased myocardial oxygen consumption. A reduced filling time and decreased sub-endocardial blood supply cause ischemia. Thus, ventricular filling is dependent on a preserved preload and maintenance of sinus rhythm.

The American College of Cardiology/American Heart Association (ACC/AHA) 2014 Guidelines, recommend aortic valve surgery is undertaken before non-cardiac surgery in a patient with severe AS. However, several reports have noted that non-cardiac surgery can be performed safely with careful anesthetic management by adjusting left ventricular preload and systemic arterial pressure and avoiding tachycardia.

Keywords: Combined spinal-epidural anesthesia; Aortic stenosis; Pulmonary hypertension

Case Presentation

We are reporting the successful anaesthesia of a 91 year old Swedish lady (height 160 cm, weight 52 kg) with severe peripheral vascular disease. The patient underwent right trans-femoral amputation due to pain, vascular insufficiency and gangrene of 1st toe. Her comorbidities included: Warfarin treated atrial fibrillation, hypertension, pulmonary hypertension (PA pressure 63 mmHg) and aortic stenosis. Trans-thoracic echocardiography before surgery revealed aortic stenosis with VTI ratio 11% of valvular area with Doppler flow 99/65 mmHg (maximum and median pressure), estimated LVEF 55%, LVH and MI grade 1 to 2 of 3. Risk stratification tools were used to calculate mortality of 18.7% Possum and P-possum 9.6%. EuroSCORE-II was calculated mortality at 4.96% (however, only 21 patients over the age of 90 are in the EuroSCORE-II database).

Due to her comorbidities and high risk stratification a Combined Spinal-Epidural (CSE) anaesthetic was chosen. Monitoring complied with the Swedish Society of Anesthesiology and Intensive Care (SFAI) standards (3 lead ECG, pulse oximetry, capnography and invasive arterial blood pressure monitoring via 20G radial catheters) were undertaken prior to anaesthesia. Aspinal anaesthetic was performed under an aseptic technique using a 27G spinal needle. 10 mg hyperbaric Bupivacaine (0.5%) and 5 micrograms Sufentanil were administered intrathecally. An 18G epidural catheter was inserted for postoperative analgesia at L2/3 level, with the catheter marking 11cm at the skin. An intravenous infusion of phenylephrine was started peripherally at 1 mg/hr after the injection of spinal anaesthetic. It was reduced to 0.5 mg/hr and then stopped after 30 minutes. 1000 ml Ringer's acetate solution was given during the procedure. The patient was hemodynamic stable throughout the procedure. Her post anaesthetic care unit stay was uneventful (Figure 1).

Discussion

No RCTs exist on this subject. Only a few case reports have been published, along with some small retrospective studies. This is surprising given the steadily increasing incidence of AS. Central Neuraxial Blockade (CNB) has well documented benefits as an anaesthetic and analgesic technique for many different types of surgery. There are no evidence based recommendations for the preferred anaesthetic regimen in patients with AS. Very few patients with severe AS have their aortic valves replaced prior to non-cardiac surgery, as is recommended in current guidelines [1-5]. This practice is suitable for elective surgery only, but in critically ill patients the advantages of performing urgent surgery; outweigh the benefits of valve replacement [6]. A meta-analysis of 9 Cochrane studies [7] looked at intermediate to high cardiac risk operations with CNB or GA ± additional CNB. It assessed postoperative rates of death, chest

Citation: Nielsen PT, De Brun Mangs S, Gonzalez MV, Howes J. Combined Spinal-Epidural Anaesthesia for Femoral Amputation in a 91yrs Old Patient with Asymptomatic Severe Aortic Stenosis: A Case Report. 2019; 1(1): 1003.

Publisher Name: Medtext Publications LLC

Manuscript compiled: Dec 13th, 2019

***Corresponding author:** Nielsen PT, Department of Anaesthesia & Critical Care, Hull University Teaching Hospitals NHS Trust, Anlaby Rd, Hull HU3 2JZ, UK, E-mail: peter.nielsen@hey.nhs.uk

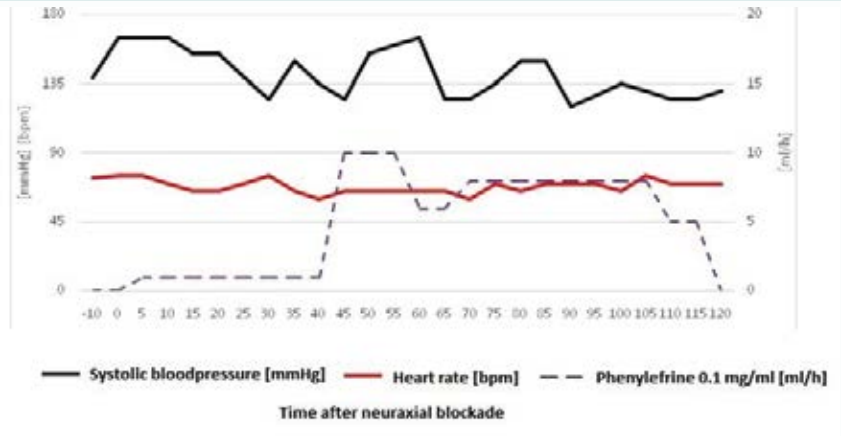

Figure 1: Trans-thoracic echocardiography.

infection, myocardial infarction and other serious adverse effects. It found that compared with GA (with or without supplementary CNB) the use of CNB alone significantly reduced the mortality rate by 2.5% (p=0.02). However the population was non-selective for AS. Amat-Santos et al. [8] suggests that epidural analgesia is well tolerated in an elderly fragile population with multiple comorbidities, for the transapical Transcatheter Aortic Valve Implantation (TAVR) procedure.

There is no conclusive evidence that CNB should not be used in patients with AS. Both cardiac and non-cardiac operations have been performed successfully using CNB in patients with AS. Neuraxial blockade with the careful titration of local anesthetics appears to be as safe as GA, when guided by invasive monitoring to optimize fluid status and guide the use of vasoconstrictors to manage hypotension.

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