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CLINICAL INFORMATION

Continuous spinal anaesthesia with minimally invasive haemodynamic monitoring for surgical hip repair in two patients with severe aortic stenosis☆

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KEYWORDS
Anaesthetic techniques – subdural;
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Abstract
Background and objectives: Aortic stenosis increases perioperative morbidity and mortality, perioperative invasive monitoring is advised for patients with an aortic valve area <1.0 cm^2 or a mean aortic valve gradient >30 mm Hg and it is important to avoid hypotension and arrhythmias. We report the anaesthetic management with continuous spinal anaesthesia and minimally invasive haemodynamic monitoring of two patients with severe aortic stenosis undergoing surgical hip repair.
Case report: Two women with severe aortic stenosis were scheduled for hip fracture repair. Continuous spinal anaesthesia with minimally invasive haemodynamic monitoring was used for anaesthetic management of both. Surgery was performed successfully after two consecutive doses of 2 mg of isobaric bupivacaine 0.5% in one of them and four consecutive doses in the other. Haemodynamic conditions remained stable throughout the intervention. Vital signs and haemodynamic parameters remained stable throughout the two interventions.
Conclusion: Our report illustrates the use of continuous spinal anaesthesia with minimally invasive haemodynamic monitoring as a valid alternative to general or epidural anaesthesia in two patients with severe aortic stenosis who are undergoing lower limb surgery. However, controlled clinical trials would be required to establish that this technique is safe and effective in these type or patients.

☆ This study was carried out at La Paz University Hospital in Madrid, Spain.
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PALAVRAS-CHAVE
Técnicas anestésicas – subdural;
Técnicas de mensuração – débito cardíaco

Raquianestesia contínua com monitoração hemodinâmica minimamente invasiva para cirurgia de reparação do quadril em dois pacientes com estenose aórtica grave

Resumo
Justificativa e objetivos: A estenose aórtica aumenta a morbidade e mortalidade no período perioperatório. A monitoração invasiva no perioperatório é recomendada para pacientes com área valvar <1,0 cm^2 ou gradiente médio >30 mm Hg, além de ser importante evitar a hipotensão e arritmias. Relatamos o manejo anestésico com o uso de raquianestesia contínua e monitoração hemodinâmica minimamente invasiva em duas pacientes com estenose aórtica grave, submetidas à cirurgia de reparação do quadril.
Relato de caso: Duas pacientes com estenose aórtica grave foram programadas para cirurgia de reparação de fratura de quadril. Raquianestesia contínua com monitoração hemodinâmica minimamente invasiva foi usada para o manejo anestésico de ambas as pacientes. A cirurgia foi realizada com sucesso após duas doses consecutivas de 2 mg de bupivacaína isobárica a 0,5% em uma das pacientes e quatro doses consecutivas na outra. As condições hemodinâmicas permaneceram estáveis durante a intervenção. Os sinais vitais e parâmetros hemodinâmicos permaneceram estáveis durante as duas intervenções.
Conclusão: Nosso relato descreve o uso da raquianestesia contínua com monitoração hemodinâmica minimamente invasiva como uma alternativa válida para a anestesia geral ou peridural em duas pacientes com estenose aórtica grave, submetidas à cirurgia de membro inferior. Contudo, ensaios clínicos controlados são necessários para estabelecer que a técnica é segura e eficaz nesse tipo de pacientes.

Introduction

Severe aortic stenosis is defined as an aortic valve area less than 0.8 cm^2 and a transvalvular peak gradient greater than 80 mm Hg.[1] Patients often presented with dyspnoea, angina and syncope on exertion. We can find patients with uncorrected severe aortic stenosis submitted to non-cardiac surgery. In these cases, anaesthetic considerations involve maintenance of sinus rhythm, normal heart rate and intravascular volume, and avoidance of hypotension. Severe hypotension can lead to coronary hypoperfusion and ventricular failure. Central blocks have been traditionally contraindicated in these patients.[1] Nevertheless, continuous spinal anaesthesia (CSA) may be of particular interest in patients with severe aortic stenosis, since it allows individualized titration of local anaesthetic and can provide greater haemodynamic stability than single-injection spinal anaesthesia.[2–4] CSA has been successfully employed in patients in whom haemodynamic stability is mandatory, as in patients with cardiac pathology undergoing lower limb surgery,[5–7] or obstetric procedures.[8–9]

We report the anaesthetic management with CSA and minimally invasive haemodynamic monitoring of two patients with severe aortic stenosis undergoing surgical hip repair.

Case report

Case 1

A 92-year-old woman was scheduled for left hip fracture repair after a left pertrochanteric femur fracture. In her past medical history we found hypertension, severe aortic stenosis and moderate mitral regurgitation. Her preoperative treatment consisted in Eplerenone, Aspirin and Furosemide. She had no known drug allergy.

We performed an echocardiogram before surgery, which revealed an aortic valve area of 0.6 cm^2 and a peak aortic transvalvular gradient of 85.4 mm Hg, added to an ejection fraction of 63% and a double mitral impairment, with moderate mitral stenosis and severe mitral regurgitation. ECG showed normal sinus rhythm.

Once in theatre, we monitored the patient with ECG, non-invasive blood pressure (NIBP) and peripheral oxygen saturation (SO_2). Basal values were: NIBP 150/78 mm Hg; heart rate (HR) 89 bpm, SO_2 100%. We inserted an arterial catheter in the left radial artery with the patient awake and slightly sedated using midazolam 0.05 mg kg^{-1} IV and 50 μg IV fentanyl; we connected the catheter to a Flotrac-Vigileo^R (Edwards LifeSciences), and measured continuously Stroke Volume Index (SVI), Cardiac Index (CI) and Stroke Volume Variation (SVV). Basal values were SVI 24 mL m^2, CI 2 L min^{-1} m^{2-1}, SVV 8%. After recording measurements, we positioned the patient in right lateral decubitus. For the CSA, we used a Micro-Spinolong set (Polymedic^R, Temena, France), in which the catheter is introduced into the subarachnoid space through a cannula that covers the needle and protects the catheter from deformation or kinking. We inserted the 27 G pencil point spinal needle at the L3–L4 vertebral interspace into the subarachnoid space. We removed the needle and advanced the 26 G cannula; through it, we inserted the 27 G catheter 4 cm into the subarachnoid space, and secured it to skin. We repositioned the patient supine and, after aspiration of cerebrospinal fluid (CSF) to confirm the correct placement