

Continuous spinal anaesthesia in frail patients for hip fracture surgery

M. O'Sullivan¹, D. El-Sabawy², O. Ní Choileáin¹, P. Mahon¹.

1. Department of Anaesthesia, Cork University Hospital, Wilton, Co. Cork, Ireland.
2. School of Medicine, University College Cork, College Rd., Co. Cork, Ireland.

Abstract

Aim

We sought to examine the morbidity and mortality of elderly, frail patients receiving continuous spinal anaesthesia for hip fracture repair in a tertiary hospital.

Methods

We reviewed the medical records of 58 patients who underwent CSA for hip fracture repair during a six-month period (January – July 2019). We examined patient's records for; (i) performance of an echocardiogram (ii) adverse peri-operative outcomes (iii) length of stay and (iv) discharge disposition.

Results

8 patients (14%) died in hospital. 24 patients (41%) had a length of hospital stay almost double that of the national average (19 vs 11 days, respectively). Only 24 (41%) of patients had an echocardiogram performed in the last five years with just two displaying features of severe aortic stenosis.

Discussion

Where there is concern surrounding physiological robustness in an elderly patient with a hip fracture a technique of CSA can be used to avoid the need for general anaesthesia and expedite access to definitive surgery.

Introduction

Hip fracture surgery presents a significant burden on health services globally and is mostly performed in older, comorbid patients. It was the third most common surgery performed in Ireland in 2023. Annually our tertiary hospital treats > 400 femoral fractures in geriatric patients with the majority (> 90%) receiving neuraxial anaesthesia. A technique of continuous spinal anaesthesia (CSA) via an intrathecal microcatheter is often used in patients perceived

to carry excessive risk (e.g., known aortic stenosis [AS], aortic murmur and no available echocardiogram, respiratory failure, advanced frailty etc.). We present outcome data on this specific subgroup comparing it with national data and the overall patient cohort undergoing hip fracture repair in our institution.

Methods

With institutional ethics committee approval, we reviewed the medical records of 58 patients who underwent CSA for hip fracture repair during a six-month period (January – July 2019). Eligible patients were identified through retrospective examination of a logbook in a dedicated ‘block bay’ for regional anaesthesia in the operating theatre complex. Patients who had CSA converted to general anaesthesia were not included. We examined patient’s records for; (i) perioperative investigations including echocardiographs, (ii) adverse peri-operative and post-operative outcomes (iii) length of stay and (iv) discharge disposition.

Results

The median age in our cohort was 85. 24 patients of 58 (41%) had an echocardiogram performed in the previous five years with two patients having features of severe AS or LVOT obstruction. Three others had documented mitral/tricuspid pathology or reduced ejection fraction. All 58 patients survived surgery. Thirty four patients (58%) were transferred to a step-down facility or other hospital for ongoing rehabilitation and recovery, with median length of stay of 11.5 days (in line with the reported national standard of 11 days). In the remaining 24 patients, median length of acute hospital stay increased to 19 days with four patients having in hospital stays in excess of 50 days. Eight patients (13.8%) died in hospital- this was more than double the mortality rate (6.1%) for all patients over 60 years of age who had hip fracture repair surgery in our hospital in 2019, $\chi^2(1) = 4.65$, $p = 0.03$.

Discussion

The patients in our cohort had a significantly higher mortality than would be expected based on local and national data.¹ No intra-operative deaths occurred in the study group. Of the patients who died in hospital the earliest post-operative death was three days after surgery. On review of the medical records we did not consider the performance of CSA to be contributory to the cause of death in any of the eight patients who died in hospital. Anaesthetists at our institution were therefore adept at identifying high risk patients as evidenced by the high mortality rate. This is despite only five patients displaying abnormal findings on echocardiogram. The decision to use CSA was based on more global patient frailty assessment rather than any one measured number such as ejection fraction or aortic gradient.

Studies of low dose spinal anaesthesia in patients with moderate to severe AS showed no significant increase in adverse outcomes.^{2,3} Advantages of CSA include the ability to titrate intrathecal local anaesthetic with lower overall cumulative dose compared to single shot spinal, resulting in better control of blood pressure and providing extended operating time.⁴ It is our practice to avoid delays in surgery in order to have a pre-operative echocardiogram performed- this is an attitude supported by guidelines.⁵ Where there is concern surrounding a patient's physiological robustness general anaesthesia is often used, however this is not without risk of peri-operative pulmonary complications- making CSA a viable alternative to single shot spinal anaesthesia.

The use of CSA for hip fracture surgery identified a subpopulation who carry excess risk of mortality. In the elderly, frail patient presenting for hip fracture surgery we commonly use a technique of CSA to protect haemodynamic stability, avoid general anaesthesia and prevent delays to surgery. We would advocate consideration of this practice in other institutions.

Declarations of Conflicts of Interest:

None declared.

Corresponding author:

Michael O'Sullivan,
Department of Anaesthesia,
Cork University Hospital,
Wilton,
Co. Cork,
Ireland.
E-Mail: osullivanmike89@gmail.com

References:

1. National Office of Clinical Audit, (2021) Irish Hip Fracture Database National Report 2020. Dublin: National Office of Clinical Audit. Accessed December 2024. <https://www.noca.ie/documents/irish-hip-fracture-database-national-report-2020/>
2. Van Herreweghe I, De Fre O, Polus F, Cops J, López AM, Vandepitte C, et al. Spinal anesthesia in patients with aortic stenosis: a research report. Regional Anesthesia and Pain Medicine. 2024:rapm-2023.
3. Johansson S, Nikolaj Lind M. Central regional anaesthesia in patients with aortic stenosis – a systematic review. Dan Med J. 2017; 64(9):A5407.

4. Minville, V, Fourcade O, Grousset D, Chassery C, Nguyen L, Asehnoune K, et al. Spinal anesthesia using single injection small-dose bupivacaine versus continuous catheter injection techniques for surgical repair of hip fracture in elderly patients. *Anesthesia & Analgesia* 2006; 102(5), 1559–1563. doi:10.1213/01.ane.0000218421.18723.cf.
5. Griffiths R, Babu S, Dixon P, Freeman N, Hurford D, Kelleher E, et al. Guideline for the management of hip fractures 2020. *Anaesthesia* 2021; 76, 225–237. doi:10.1111/anae.1529.