

Anesthetic Management of Bilateral Neck of Femur Fracture for Bilateral Hip Arthroplasty with CKD and Seizure Disorder

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Abstract

In elderly hip fractures are common presentations which require surgical intervention. These patients have increased morbidity and mortality due to associated comorbidities like renal, cardiac, respiratory, endocrine or neural diseases. Chronic kidney disease is one of the common complications of long standing uncontrolled hypertension and diabetes mellitus. Patients with CKD are exposed to an increased risk for adverse outcomes and further perioperative injuries resulting from hemodynamic instability, hypovolemia, or drug toxicity, each of which has the potential to aggravate renal dysfunction, ultimately leading to end stage renal disease, and reduced long-term survival. It is estimated that there are approximately 7.85 million chronic renal failure patients in India.¹ Diabetes mellitus and hypertension reaching epidemic proportion in urban population and chronic kidney disease being inevitable in long standing untreated cases, providing anesthesia to patients with chronic kidney disease poses a challenge.

Case Report: A 48yr old male presented with bilateral neck of femur fracture following fall from height and was planned for bilateral hip arthroplasty. Patient is a known case of CKD on maintenance haemodialysis. He is also a known hypertensive, diabetic and seizure disorder on treatment. Patient has underwent epidural anesthesia.

Conclusion: We present a successful anesthetic management of a dwarf patient with bronchial asthma and hypothyroidism who underwent hysterectomy. We emphasize the risk of neurological injury while extending the neck during laryngoscopy for tracheal intubation due to anatomical abnormalities in these patients. A detailed pre anesthetic evaluation and planning is utmost important and the anesthetic technique has to be individualized based on the patients anatomical characteristics and associated co-morbidities.

Keywords: CKD; Spinal anesthesia; neck of femur fracture.

Key Messages: CKD has its own complications. Ongoing GA may cause further damage to kidney and aggravate metabolic acidosis, as metabolism of drugs is impaired. Spinal anesthesia may cause hypotension, which may cause ill effects on heart. Continuous spinal or epidural anesthesia can be used.

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INTRODUCTION

In elderly hip fractures are common presentations which require surgical intervention. These patients have increased morbidity and mortality due to associated comorbidities like renal, cardiac, respiratory, endocrine or neural diseases. Chronic kidney disease is one of the common complications of long standing uncontrolled hypertension and diabetes mellitus. Patients with CKD are exposed to



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an increased risk for adverse outcomes and further perioperative injuries resulting from hemodynamic instability, hypovolemia, or drug toxicity, each of which has the potential to aggravate renal dysfunction, ultimately leading to end-stage renal disease, and reduced long-term survival. Spinal anesthesia provides nerve blockade in a large part of the body during surgery with a smaller dose of local anesthetic and shorter surgery onset time. However, spinal anesthesia may lead to adverse haemodynamic changes, such as severe and prolonged hypotension in high-risk patients. Continuous spinal anesthesia (CSA) provides extending blockade during surgery and versatile pain management during the postoperative period via an indwelling catheter, allowing intermittent injection of local anesthetic into the subarachnoid space. Better cardiovascular stability, less local anesthetic requirement, better control of anesthesia level and lower risk of local anesthetic toxicity were reported in the CSA technique compared with a single dose spinal anesthesia technique.³ We reported a high risk patient who underwent successful hip fracture surgery under CSA.

Case Report A 48 yr old male presented with bilateral neck of femur fracture following fall from height and was planned for bilateral hip arthroplasty. Patient is a known case of CKD on maintenance haemodialysis. He is also a known hypertensive, diabetic and seizure disorder on treatment. patient had history of breathlessness and reduced urine output since 3 days prior to fall.

On general physical examination patient was disoriented and tachypneic. He was pale and had bilateral pedal edema. His vital parameters were checked which revealed respiratory rate of 28/min, SpO₂ 90% on room air. On respiratory auscultation bilateral crepts were present. He was resuscitated and was kept on bipap support for pulmonary edema.

Laboratory investigations were haemoglobin 7.6 gm/dL, platelets - 247,000/mm³, WBC-9000/mm³, Blood urea-96 mg /dL, serum creatinine 6, sodium-127, potassium-5.6, ECG showed sinus tachycardia with tall t waves 2decho showed-concentric LVH, trivial MR/AR, Trivial TR, Normal systolic function LVEF =60%, CXR showed kerley B lines and pulmonary congestion.

In preoperative evaluation patient had features of mild pedal edema. History of seizures was ruled out as there was no resting tachycardia, orthostatic hypotension, no variation of heart rate on deep breathing. His lab investigations were serum creatinine 6 milligram per deciliter (mg/dl), blood

urea 108mg/dl, serum sodium 126mili equivalents per liter (mEq/L), serum potassium 5.3mEq/L, Rest of the investigations - complete blood count, coagulation profile, electro cardiogram (ECG) - Tall t waves, sinus tachycardia and echocardiography - concentric LVH. He was on medications Tablet clinidipine 10mg bd, prazosin 2.5 mg bd, metoprolol 25 mg bd, levipil 500 mg. Had a history of blood transfusion, his daily fluid intake was restricted to a total of 1.5 liters and his daily urine output was in between 1.5 to 1.7 liters., heart rate of 86 bpm: blood pressure of 116 /74 mm hg, respiratory rate of 22cpm and saturation of 94%.

Plan of Anesthesia- Epidural anesthesia¹ Two 18 Gauge intra venous cannula was inserted in the right and left dorsum of hand and 500 cubic centimeters (cc) of 0.9% normal saline was used for preloading. Midline approach was adopted with patient in sitting position, L2-L3 inter space was entered and epidural space identified by loss of resistance to air. 2 (ml) glass syringe was connected and negative aspiration was confirmed for blood and cerebrospinal fluid. Epidural catheter inserted and fixed at 9 centimeter (cm) to skin. Space was confirmed by a test dose containing lidocaine with adrenaline 2%(1 in 2, 00, 000). A bolus injection of 10 cc bupivacaine 0.5% and 2 cc 100 microgram (µg) of fentanyl-a total of 12 cc injected in supine position, a sensory level till T8 was achieved. Monitoring- ECG, heart rate (HR), non-invasive blood pressure (NIBP), pulse oximeter, central venous pressure (CVP), urine output, random blood sugar and arterial blood gas monitoring were done (Total duration of surgery was 4 hour. Urine output intraop-410. Total fluids-normal saline 2000 ml Blood sugar was 87 mg/dl intra operatively. Plan A was to give epidural anesthesia and plan B is continuous spinal.

DISCUSSION

Regional anesthesia like epidural can also be considered I in these patients if coagulation profile is not deranged. In case of general anesthesia drug toxicity may be present due to altered drug clearance, most of the drugs could be nephrotoxic. EChronic kidney disease is defined as either a glomerular filtration rate (GFR) less than 60ml/min/1.73m² for 3 months or a kidney damage leading to decrease in glomerular filtration rate present for 3 months or more. 2 Chronic kidney disease is divided into 5 stages. In a study which included pediatric age group, posted for renal transplantation the authors concluded that epidural anesthesia maintained good kidney

function better than general anesthesia.¹⁰ A study on patients with peri-operative kidney dysfunction posted for total hip replacement concluded that epidural anesthesia when carefully managed does not appear to predispose chronic kidney disease to acute renal failure.³ Postoperative epidural opioid analgesia obviated the need for oral/parenteral analgesics and their effects on the compromised renal organ system. Proper understanding of organ system dysfunction, nature of surgical procedure, choice of anesthetic technique and maintenance of vital parameters in normal range perioperatively all contribute to successful management of patients with complex medical problems undergoing procedures. Although there are patients with chronic kidney disease for whom the benefits of general anesthesia outweigh the risks, regional anesthesia can be offered to select patients where general anesthesia carries more risks, but with a careful analysis of individual patients.⁴

CONCLUSION

Regional anesthesia avoids poly pharmacy and thus reduces the risk of patient needing hemodialysis in the immediate post-operative period and thus can be considered as anesthesia of choice for patients

with chronic kidney disease.⁵

Conflict of Interest: NIL

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