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Elderly Cardiac Patient for Lumbar Spine Procedure: Perioperative Management

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ABSTRACT

Spine procedures are on the increase globally, predominantly due people living to older ages of 65 years and above. This global trend is also reflected in Nigeria and due availabilities of professionals and facilities to manage these patients. A large majority of patients that present for spine procedures are elderly, and are likely to have several comorbidities, hence a multi-disciplinary approach cannot be over emphasised. Different professional team to manage and prepare them for surgery, as well as competent anaesthetist team who understands the pathophysiology of elderly patients to manage them perioperative. This case report highlights the importance of team approach to successful management of an elderly patient with numerous challenges.

Keywords

Elderly patients, Spine procedures, Low ejection fraction, Multi-disciplinary approach.

1. Introduction

Due to advances in medical sciences and technology over recent decades, humans are living longer, which comes with medical challenges of aging [1,2].

Elderly people face several medical challenges, including:
Chronic Diseases: Conditions such as hypertension, diabetes, arthritis, and heart disease are common.

Cognitive Decline: Increased risk of dementia, Alzheimer's disease, and other cognitive impairments.

Sensory Impairments: Vision and hearing loss can impact quality of life.

Osteoporosis and Fractures: Bone weakening leading to fractures, especially in hips and vertebrae.

Malnutrition: Due to difficulty swallowing, poor appetite, or economic factors.

Polypharmacy: Managing multiple medications increases the risk of adverse effects and interactions.

Immune System Decline: Increased susceptibility to infections.

Mental Health Issues: Depression and anxiety are prevalent but often underdiagnosed.

Mobility Limitations: Reduced strength and balance increase fall risk.

Dental Problems: Poor oral health, impacting nutrition and overall health.

Addressing these challenges involves comprehensive healthcare, regular screenings, preventive measures, and social support [3]. Even more daunting is managing these challenges perioperative, which is becoming a more common occurrence for the anaesthetists as we having more elderly patients to manage [4,5]. Over the past

several decades, the volume of spine surgeries has shown a steady increase, with continued upward trends in spinal fusions, disc replacements, and vertebroplasties. A large percentage of patients seeking these surgeries are 60 years and above often having several morbidities usually seen with the elderlies [6,7]. The number of spine procedures done at Garki Hospital Abuja, also follows global trend due to increasing patients in the older age range group as well as the availability of spine surgeon as well as competent anaesthetists to handle this procedure. The anaesthetic team should be ready to handle the challenges of the procedure, the positional changes, as well as comorbidities of these patients.

2. Case study

We present a 70yr old male, known hypertensive and asthmatic scheduled for posterior lumbar interbody fusion (PLIF) on account of severe L4-S1 canal stenosis with exit root compression. He presented with complaints of lower back pain of 2 years duration, gradual in onset, intermittent, pain score of 10, using the numerical scale, pain said to be severe enough to make mobility difficult, radiating to lower limbs. No known aggravating or relieving factors, no associated weakness nor incontinence.

A known hypertensive reviewed by the cardiology team and being managed as a case of heart failure with reduced ejection fraction New York Heart Association NYHA) class II. Currently on Tablets (Tabs) Amlodipine 10mg dly, Tabs Indapamide 1.5mg dly, Tabs Telmisartan 80mg dly with sub-optimal blood pressure control. A known asthmatic, last episode 3 years ago and aborted with salbutamol inhaler, he had cervical laminectomy in 2016 under general anaesthesia with no anaesthetic complication. He has missing upper and lower incisors and presently wearing artificial dentures.

Cardiologist Review

Invited to review, the above named 70-year-old male being worked up for PLIF on account of severe lumbar spondylosis.

He is a known hypertensive with poor blood pressure control who has developed hypertensive heart failure though not in acute decompensation.

Electrocardiogram (ECG) done showed left ventricular hypertrophy with widespread T wave abnormality and premature ventricular contractions (PVCs). Echocardiogram (ECHO) done showed ejection fraction (EF) of 34%, septal hypertrophy, grade 3 left ventricular diastolic dysfunction. Moderately impaired left ventricular diastolic dysfunction, global left ventricular hypokinesis. Mildly sclerosed aortic valve leaflets with mild aortic regurgitation. Irregular heartbeat. New York heart association NYHA classification is II.

ASS; Heart Failure with reduced ejection fraction

Comments

Patients cardiovascular status may be able to tolerate the surgical procedure however, the following precautions should be taken:

1. Avoid fluid overload
2. Ensure minimal blood loss
3. Avoid cardio depressants medications/pro-arrhythmic medications
4. Ensure prompt intraoperative blood pressure control

Neurosurgery Review

A 70-year-old man, known hypertensive and asthmatic who is being worked up for PLIF on account of severe lumbar spondylosis evidenced by magnetic resonance imaging (MRI) scan.

He presented with complaints of:
- Low back pain x 2/12

Low back pain was sudden in onset, localized to his lower back, intermittent in nature, 10 on the pain scale, severe enough to make him immobile, radiates to both lower limbs with associated neurogenic claudication, pain is more on the right compared to the left, and relieved by analgesics.

Past surgical history was cervical laminectomy done in 2016 following accident in 1982, where he lost his anterior lower and upper incisors and is now on removable dental prosthesis. Lumbosacral MRI done revealed: L4-S1 severe canal stenosis with exit root compression.

Intraoperative management

The patient was wheeled on a stretcher into the operating room (OR), and attached to monitor for the baseline and continuous monitoring; these included non-invasive blood pressure NIBP (on both upper extremities at 2 minutes intervals), ECG, peripheral oxygen saturation SPO2, and pulse rate PR. He had 2 puffs of salbutamol inhaler administered and was preoxygenated for 5 minutes with 100% oxygen during this period he was premedicated with ceftriaxone 2g, 1g tranexamic acid, 8mg dexamethasone, and 200mg of hydrocortisone all intra venous IV. He had 10mg of Tab amlodipine an hour before coming to the theatre. Fentanyl 100mcg as preemptive analgesia which was intravenously administered; co-induction of anaesthesia was done with IV midazolam 2mg, propofol 50mg and ketamine 50mg.

After test ventilation, 8mg of IV pancuronium was given and intubated after 3 minutes with 7.5mm cuffed reinforced endotracheal tube. Throat pack with wet guaze and eyes closed and padded to prevent dryness and ischemic injury. Intermittent pneumatic compression device was attached on his legs. The right internal jugular vein was cannulated with size 7 central line catheter and patient was then positioned prone.

Monitoring of vitals as stated above with random glucose every hour. Analgesia maintained with IV paracetamol 1.2g, IV nefopam 40mg, IV ketorolac 60mg. Hypnosis maintained with sevoflurane at a MAC of 0.5-1% also 1mg of midazolam every hour to prevent awareness under anaesthesia. Paralysis was maintained with intermittent IV pancuronium 2mg (had 3 top up doses was given

throughout duration of surgery). IV norepinephrine 8mg in 500mls of 0.9% saline was commenced and titrated to effect.

Patient received a total of 1.5L of 0.9% saline, 1 unit of pack cell was transfused. Urine output ranges between 80 to 100ml/hr, estimated blood loss EBL was 800mls. The procedure lasted 3hours. Intra operative vitals ranged from systolic blood pressure SBP 88-128, diastolic blood pressure DBP 56-82mmHg, PR 61-88bpm RR 12cpm SPO2 98 - 100%. After the procedure, the patient was placed supine on a trolley, throat pack and eyes pad were removed and extubated fully awake after administration of IV glycopyrrolate 0.4mg with neostigmine 2.5mg. Anti-emetics prophylactic IV ondansetron 8mg. The immediate post op vitals were BP 128/72mmHg, PR 69bpm, RR 18, SPO2 96 in room air. He was transferred to the intensive care unit ICU for close monitoring and discharged after two days in ICU.

3. Discussion

This case highlights the importance of meticulous preoperative assessment and tailored anaesthetic management in patients with reduced ejection fraction undergoing non-cardiac surgery [8]. Given this patient's compromised cardiac function, a multidisciplinary team plan was imperative to optimize perioperative outcomes. He was reviewed by the cardiologist who advised on fluid restriction and Ejection fraction will not improve no matter how long surgery is delayed [9,10].

He would had benefited from invasive blood pressure monitoring and central venous pressure monitoring for optimal fluid control [11,12]; however, this was circumvented with use of modified extended haemodynamic monitoring with the use of 2 non-invasive blood pressure on both upper arms set at interval of 2 minutes and hourly monitoring of the urine output to be assured of tissue perfusion. Anaesthesia was induced with cautious titration of anaesthetic agents, avoiding significant hypotension. Maintenance of hemodynamic stability was achieved with judicious fluid management and vasopressors as needed. Care was taken to prevent myocardial depression and avoid sudden drops in systemic vascular resistance.

4. Conclusion

Perioperative morbidity in the elderly will continue to increase, hence multi-disciplinary approach to their management is important to ensure a successful outcome. A team who understand the challenges of the elderly, especially anaesthetist team who understands each individual patient, haemodynamic monitoring, fluid management, temperature regulation, use of vasoactive agents etc cannot be over emphasized.

Abbreviations

bpm	beats per minute
BP	Blood pressure
dly	daily
DBP	Diastolic blood pressure
ECHO	Echocardiogram
ECG	Electrocardiogram
EBL	Estimated blood loss
g	gram
ICU	intensive care unit
iv	intravenous
L	Litres
L	Lumbar
mri	magnetic resonance imaging
mcg	microgram
mg	milligram
mmHg	millimetres of mercury
ml/hr	millitres/hour
mac	minimum alveoli concentration
NYHA	New York Heart Association
NIBP	Noninvasive blood pressure
OR	operating room
%	percentage
SPO2	peripheral oxygen saturation
PLIF	posterior lumbar interbody fusion
PVCs	Premature ventricular contractions
PR	pulse rate
RR	Respiratory rate
S	Sacral
SBP	Systolic blood pressure
Tabs	Tablets

Conflicts of Interests

The authors declare no conflict of interest.

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