



Case Series of Three High Risk Patients for Lower Limb Surgeries Anaesthetized With Femoral With Sciatic Block

KEYWORDS

Femoro-sciatic block, Guillain-Barré syndrome, Dilated Cardiomyopathy

Dr. GIRISH SAUNDATTIKAR

S.K.Navale Medical College and General Hospital, Off. Mumbai Pune Highway, Narhe. Pune 411051.

* Corresponding author

Dr. ADNANALI SARKAR

M.D. Anaesthesiology, B-304, Parmar Pavan, Opp Rupee Bank, Kondhwa, PUNE. 411048

Dr. Smita Saundattikar

S.K.Navale Medical College and General Hospital, Off. Mumbai Pune Highway, Narhe. Pune 411051

ABSTRACT

Guillain-Barré syndrome (GBS) an acute autoimmune demyelinating polyneuropathy with ascending motor weakness, sensory and autonomic dysfunction can cause significant morbidity requiring long hospital inpatient stay and significant periods of rehabilitation. Severe autonomic instability and sensitivity to skeletal muscle relaxants poses a challenge for anaesthetic management of these patients when they come for surgery. Similarly, Dilated Cardiomyopathy and Severe Ischemic heart Disease are high risk conditions for anaesthetic management especially if associated with major haemodynamic instabilities.

We are reporting a case series of three such High Risk patients of lower limb surgeries who were effectively managed with Femoro- Sciatic Nerve block, thus avoiding severe haemodynamic instability associated with General or Spinal Anaesthesia in such patients.

Patients with severe cardiac disease pose anaesthetic challenge due to low cardiac output. Both general and regional anaesthesia with central neuraxial blockade carry potential risk. One of the most useful yet most neglected anesthetic procedures is the combination of sciatic and femoral nerve block. In life threatening emergencies, PNBs are worthwhile considering when administered with extreme care and monitored closely.

We are reporting a case series of three cases of lower limb surgeries with different high risk co-morbidities managed with femoral and sciatic nerve block as the sole anaesthetic.

Case 1-

A 34 yrs, 48 kg, female, known case of Guilliane Barre Syndrome with bilateral foot drop for tendon transfer, one limb at a time. History of upward moving paralysis of the body, requiring two months ventilatory support along with tracheostomy, about 6 years ago. On examination, central nervous system examination revealed Steppage gait, Grade 0 power in EHL, FHL and absent knee and ankle reflexes.

Pulmonary Function Tests- Early small airway obstruction
NCV- Mixed sensory motor poly-radicleuropathy of Lower Limb
EMG- Diffuse axonopathy

Case 2

A, 70 yrs, female, known hypertensive since 5 yrs, on Amlodepin + Atenolol and Ecosprin, came with left leg dry gangrene for Syme's amputation.

On examination, HR- 50-68/ min, irregularly irregular, BP- 110/70 mmHg, CVS- S1, S2, heard, RS- clear

ECG- AF with T inversion in II, III, aVf, V4, V5 and V6

2DEcho- All 4 chambers dilated, moderate AR, MR and TR, global LV hypokinesia, EF%- 30%

Diagnosis- Dilated Cardiomyopathy with Atrial Fibrillation with controlled Ventricular Rate with Peripheral Vascular Disease for left Syme's Amputation.

Case 3-

A, 53 yrs, male, known case of Hypertension, Ischemic Heart Disease and COPD came for open reduction and internal fixation of Right Femoral Supraconylar fracture.

ECG- T inversion in II, III, aVf

2DEcho- Global Hypokinesia, Gr II Diastolic Dysfunction, EF- 25%

Choice of Anaesthesia-

In case of GBS, General Anaesthesia is highly unpredictable due to susceptibility to neuro muscular blocking agents patient could go again on post op ventilation, it was discussed with the patient and decided to avoid it. After sub arachnoid block worsening of GBS have been reported in some cases. Also autonomic deregulation can be massive leading to severe intractable hypotension. The use of neuraxial anesthesia is questionable because it might influence the course of the disease. So, plan of giving Right side Femoral and Sciatic nerve blocks was made.

In case of DCM and IHD, since general and spinal anaesthesia are associated with severe and unpredictable haemodynamic instability because of autonomic blockade and various drugs used in general anaesthesia. Regional peripheral nerve block (Femoral with sciatic nerve) for lower limb was discussed with the patient and after approval from patient was finalized.

After securing IV line and attaching monitor (NIBP, SpO₂, ECG), patient was sedated with 1.0 mg Midazolam i.v. Initially, patient was in supine position and femoral nerve block was given for tourniquet application with nerve stimulating needle with PNS after eliciting rectus femoris contractions at 0.4 mA and 20 ml of drug (0.5 % bupivacaine 8 ml, 2% Xylocaine+Adrenaline 6 ml, 50 ml Tramadol, 5 ml

0.9% NS) was given.

Then, lateral position was given for posterior approach sciatic nerve block. After identifying the landmarks and marking the points, 9 cm long nerve stimulating needle was used along with PNS to elicit the plantar extensor response upto 0.5 mA and 25 ml of drug (0.5 % bupivacaine 8 ml, 2% Xylocaine+Adrenaline 6 ml, 50 ml Tramadol, 10 ml 0.9% NS) was given.

Surgery started under tourniquet after adequate block level was confirmed. Intra-operatively vitals were stable in all three cases and was given. Inj. Fentanyl 50 microgram for anxiety. The surgery went off uneventful and patient was shifted to recovery room.

DISCUSSION

Guillain-Barré syndrome (GBS)

An acute autoimmune demyelinating polyneuropathy first described in 1859. There is an association with precedent infections in 70% of cases that are predominantly respiratory and gastrointestinal in origin. Progressive ascending motor weakness starting in the lower limbs ascending upto respiratory muscles and cause respiratory failure [1]. Sensory symptoms may include pain, numbness and paraesthesia. On clinical examination a flaccid areflexic paralysis is found. Autonomic dysfunction is common and may cause arrhythmias, swings in blood pressure, urinary retention, paralytic ileus and hyperhydriasis. If severe this may be associated with sudden death. [4]

Nerve conduction studies- Findings depend on subtype of GBS. The majority show demyelinating pattern while some patients may show evidence of axonal loss with little or no demyelination.

PFTs- These may show reduced vital capacity, maximal inspiratory and expiratory pressures. Arterial blood gases may indicate progressive respiratory failure.

MANAGEMENT

Supportive-

Airway and respiratory

Around 30% of patients with GBS require ventilatory support. Tracheostomy should be considered if prolonged respiratory support is likely to be needed.

Anaesthetic considerations

Cases of GBS after epidural and general anaesthesia has been reported. [5]

Suxamethonium is absolutely contraindicated in patients with GBS. There have been a number of case reports of severe hyperkalaemia, life threatening arrhythmias, and cardiac arrest after its administration. [3]. Also, they could be hypo or hypersensitive to vecuronium. [4]

Cardiovascular

Autonomic dysfunction occurs in around 70% of patients and may be life-threatening. The most common arrhythmia seen is sinus tachycardia but various other ECG changes have been observed including atrial and ventricular tachyarrhythmias, prolonged QT interval, atrioventricular blocks and even asystole. [4] Blood pressure may fluctuate between severe hypertension and hypotension. Care should be taken when treating extremes of blood pressure with vasoactive drugs as patients may be particularly sensitive to their effects. Intubated patients with autonomic dysfunction may develop instability after tracheal suction. [2]

PROGNOSIS

Most patients with GBS recover fully but this may take many months of intensive therapy. 15% of patients suffer persistent disability. 10% are unable to walk unaided at one year. There may be a recurrence in 2–5% of cases. The mortality from GBS ranges from 2–12%. [2]

Dilated Cardiomyopathy (DCM)-

DCM is a primary myocardial disease characterized by LV or biventricular dilation, systolic dysfunction, and normal LV wall thickness. The etiology of DCM is usually unknown but may be genetic or associated with infection such as viral coxsackie B infection. There is a familial transmission pattern in approximately 30% of cases, usually autosomal dominant. Many types of secondary cardiomyopathies have the features of DCM. [6] These include the cardiomyopathies associated with alcohol, cocaine, the peripartum state, pheochromocytoma, infectious diseases (human immunodeficiency virus), uncontrolled tachycardia, Duchenne's muscular dystrophy, thyroid disease, chemotherapeutic drugs, radiation therapy, hypertension, CAD, and valvular disease. DCM is the most common type of cardiomyopathy, the third most common cause of heart failure, and the most common indication for cardiac transplantation.

The presence of heart failure has been described as the single most important risk factor for predicting perioperative cardiac morbidity and mortality. In the preoperative period, all precipitating factors for heart failure should be sought and aggressively treated before proceeding with elective surgery.

Regional anesthesia is acceptable for suitable operations in heart failure patients. In fact, the modest decrease in systemic vascular resistance secondary to peripheral SNS blockade may increase cardiac output. However, the decreased systemic vascular resistance produced by epidural or spinal anesthesia is not always predictable or easy to control. The pros and cons of regional anesthesia must be carefully weighed in heart failure patients.

Prognosis

Symptomatic patients with DCM referred to tertiary care medical centers have a 5-year mortality rate of 50%. If the cardiomyopathy involves both the left and right ventricles, the prognosis is worse. Hemodynamic abnormalities that predict a poor prognosis include an ejection fraction less than 25%, pulmonary capillary wedge pressure higher than 20 mm Hg, cardiac index less than 2.5 L/min/m², systemic hypotension, pulmonary hypertension, and increased central venous pressure. Alcoholic cardiomyopathy is largely reversible if complete abstinence from alcohol is maintained.

Ischemic heart disease

Myocardial ischemia, left ventricular dysfunction, and cardiac dysrhythmias are usually responsible for the signs and symptoms of ischemic heart disease.

Intraoperative events associated with persistent tachycardia, systolic hypertension, sympathetic nervous system stimulation, arterial hypoxemia, or hypotension can adversely affect the patient with ischemic heart disease. Perioperative myocardial injury is closely associated with heart rate in vascular surgery patients. A rapid heart rate increases myocardial oxygen requirements and decreases diastolic time for coronary blood flow and thus oxygen delivery. The increased oxygen requirements produced by hypertension

are offset to some degree by improved coronary perfusion. [8] Hyperventilation must be avoided because hypocapnia may cause coronary artery vasoconstriction. Maintenance of the balance between myocardial oxygen supply and demand is more important than the specific anesthetic technique or drugs selected to produce anesthesia and muscle relaxation.

Clinical Predictors of Increased Perioperative Cardiovascular Risk in this case (compensated heart failure, co-existing hypertension and COPD, Abnormal ECG) suggested moderate to high risk for complications of Anaesthesia. [7]

Any hypoxia, hypercarbia, acidosis, tachycardia (due to pain, sympathetic stimulation or GA) can worsen ischemia or pulmonary oedema.

Most commonly used anaesthetic technique for lower limb procedure is CNB (spinal or epidural). However, its use is limited in compromised cardiac status due to frequent hypotension caused by sympathetic blockade. [9]

Considering the above factors and available techniques, the combined femoral and sciatic nerve blocks for lower limb anaesthesia was planned. It is associated with minimal haemodynamic alterations.

Femorosciatic nerve block via posterior approach and femoral nerve block via classic technique, using nerve locator, is highly efficacious for lower limb orthopedic surgeries.

Regional nerve block is a safe, effective option for all lower extremity surgeries with no major systemic effects or complications resulting from its use. [10,11]

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