

# Extrapyramidal syndrome - anaesthetist's challenge: A case report

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**ABSTRACT**

Extrapyramidal syndrome (EPS) is the condition commonly referred to as drug induced movement disorders, due to the side effects of drugs which the patients experience from dopamine receptor antagonists. The symptoms of EPS are debilitating, which interfere with the social functioning and communication, motor tasks and activities of daily living. This ultimately is associated with poor quality of life which may result in multiple hospital visits. This case is of a 28 years old female patient who was the known case of EPS and epilepsy and was on medications of antipsychotic drug Olanzapine, dopamine receptor agonist levodopa (100mg) plus carbidopa (25mg) and anti-epileptic drug levetiracetam who presented with an abscess in left loin region for 5 days which was insidious in onset and then gradually increased in size. It was associated with pain. This case study discusses how the patient with EPS with decreased swallowing reflexes, poor nutritional status and condition requiring surgery poses challenges to the anaesthesiologists in the peri operative period.

**Keywords:** Extrapyramidal syndrome, dopamine receptor blocking agents, abscess, epilepsy, anaesthesiologist.

**1. INTRODUCTION**

Extrapyramidal syndrome, also called as drug- induced movement disorders, is a condition caused by adverse effects of certain antipsychotic and other drugs. These adverse effects include involuntary or uncontrollable movements, tremors, muscle contractions, bradykinesia and postural instability (Blanchet, 2003). It was described initially in the year 1952 after chlorpromazine induced symptoms similar to Parkinson's disease (Rifkin, 1987). Other idiopathic movement disorders need to be differentially diagnosed from EPS, this includes serotonin syndrome, neuroleptic malignant syndrome also called as Parkinsonism hyperpyrexia syndrome, Huntington disease, Sydenham chorea, Wilson's disease and cerebrovascular lesions.

Pathophysiology of EPS involves the blocking effect of dopaminergic D2 receptors in the mesocortical and mesolimbic pathways of the brain. Also, the antagonistic action of dopamine receptors in the basal ganglia and caudate nucleus contribute significantly to the development of EPS. Centrally acting dopamine receptor blocking agents, namely the first-generation

antipsychotics like phenothiazine neuroleptics and haloperidol are the most common medications associated with the occurrence of EPS (Li et al., 2016).

Other drugs which have dopaminergic antagonistic effects also cause EPS which include anti-emetics (like metoclopramide and droperidol), tricyclic antidepressants (TCAs), serotonin reuptake inhibitors (SSRIs) and lithium. Other drugs which rarely can lead to EPS are valproic acid, antivirals and antiarrhythmic drugs. Anaesthesia management of the patient with EPS and interactions of anaesthetic drugs with antipsychotic medications are to be taken into the consideration.

## 2. CASE PRESENTATION

A 28 years old girl who is a known case of extra pyramidal syndrome since 5 years presented with an abscess in the left loin region for 5 days, which was slow in onset and was gradually increasing. She was found in a poor state of nutrition with a weight of 30 kilograms, with muscle rigidity, postural instability and bradykinesia (Image 1). She also had a history of seizures for 2 years for which she was on regular medication. Patient was hospitalised for the abscess which was gradually increasing in size and was associated with pain (Image 2).



**Image 1** Showing preoperative status of the patient

In preoperative room, her Glasgow Coma Scale (GCS) was E4V1M1. Her pulse rate was 120/ minute, Blood pressure 100/70 mmHg and RR 12/ minute. She was on regular treatment of Tab levetiracetam 500 mg OD, Tab Olanzapine 2.5 mg HS and Tablet levodopa (100mg) plus carbidopa (25mg). General physical examination revealed an emaciated thin body, pale and febrile patient. Cardiovascular, respiratory and gastrointestinal examinations were not significant. Central nervous system examination revealed her in the semiconscious state and was not oriented to time, place and person. Motor system examination showed muscle wasting along with rigidity, bradykinesia and postural instability. Her speech was hypophonic and monotonous.

Routine investigations were done including complete blood count (CBC), liver, kidney and thyroid function tests - LFT, KFT and TFT respectively. CBC revealed anaemia with haemoglobin (Hb) of 7 gram/decilitre and total leukocyte count of 30000/cumm. Rest CBC findings were normal. KFT revealed electrolyte imbalance with serum Sodium 132 mg/dl and potassium 5.2 mg/dl. LFT revealed hypoalbuminemia with serum albumin levels of 2.6 mg/dl and coagulopathy with increased International Normalised Ratio (INR) 1.6.

Magnetic Resonance Imaging (MRI) of the brain was done which revealed prominent sulcal-gyral spaces, lateral ventricles and cerebella's Folia (Image 3). USG of the local site revealed hypoechoic collection with debris and septations within, measuring approximately 15\*11\*8 cm in subcutaneous plane extending into the inter muscular plane suggestive of an infective origin. Her chest X-ray and abdomen ultrasonography were non-contributory. She was planned for the incision and drainage of the abscess. As it was in the deep planes of muscle, surgeons requested for General Anaesthesia. Relatives were explained about the high risk in

view of her preoperative condition and poor nutritional status. Postoperative ventilator support and ICU stay requirements were explained. Nil by mouth status of the patient was confirmed.



**Image 2** Showing abscess in the left loin region

Patient was taken inside the operative room and all the standard parameters like pulse oximetry, ECG, NIBP were attached. An 18-gauge intravenous cannula was secured. All necessary precautions were taken by avoiding drugs precipitating EPS like antiemetic metoclopramide. Patient received second generation anti-psychotic drug olanzapine 2.5 milligrams instead of first-generation antipsychotic drugs like chlorpromazine and prochlorperazine which are most commonly known to precipitate extra pyramidal symptoms. Patient received levetiracetam 500 milligram as an anti-epileptic instead of sodium valproate, which may precipitate extra pyramidal symptoms.

Patient was premeditated with 0.2 mg intravenous injection of glycopyrrolate and 50 mcg intravenous injection of fentanyl. Induction was mainly inhalational with sevoflurane with a supplemental dose of 50 mg intravenous injection of propofol. She was paralysed with 50 mg intravenous injection of succinylcholine. Patient was preoxygenated with 100% oxygen for 4-5 minutes prior to induction as we wanted to avoid ventilating the patient after administration of intravenous injection of succinylcholine due to the fear of aspiration.

Rapid sequence induction was done and so immediately the patient was intubated with 7 millimetres cuffed Endotracheal tube and ventilated with Tidal volume of 300 millilitres, RR 16/minute on volume control mode of ventilation. Patient was given right lateral position for the incision and drainage of abscess on the left side of loin. All the bony points were sufficiently padded with cushion bandages. All necessary care was taken while positioning and was secured to prevent rolling. She was maintained on nitrous oxide: Oxygen- 2:2 with intravenous injection of atracurium muscle relaxant at the dose of 15 milligrams. Depth of anaesthesia was maintained with adequate analgesia and inhalational agent sevoflurane.

Successful incision and drainage was done and the entire surgery lasted for 1 hour (Image 4). On adequate spontaneous breathing, the patient was extubated after good oral suctioning and administration of reversal myopyrrolate (neostigmine with Glycopyrrolate) 1.5 mg. Patient was in the same condition as she was in the preoperative state with the same GCS score of E4V1M1. She was still extubated on the basis of her adequate spontaneous breathing (Image 5).





**Image 3** MRI Image showing prominent sulcal-gyral spaces, lateral ventricles and cerebella's folia



**Image 4** Showing postoperative wound status



**Image 5** Showing postoperative status of the patient

### 3. DISCUSSION

The anaesthetic management of the patients with diagnosed Extrapyrimal syndrome on psychoactive drugs in the peri operative period is completely based on individual anaesthesiologist's experience (Peck et al., 2010). Challenges for the anaesthesiologist may develop from the kind of psychiatric and mental condition itself, interaction of anaesthetic and psychoactive drugs and the complications caused by the condition itself requiring surgery like electrolyte imbalance and prolonged periods of fasting.

This article aims to focus on the anaesthetic management of the patient with diagnosed Extrapyrimal syndrome who presented with decreased swallowing reflexes and in the overall poor nutritional status. It was very challenging in part of providing anaesthesia to this patient in view of her deranged liver function test values, low Hb value, and elevated total leukocyte count and electrolyte imbalance. Another challenge was positioning the patient in the right lateral position. Despite all these findings it was decided to give general anaesthesia. Total intravenous anaesthesia was avoided as we wanted to secure the airway thereby avoiding aspiration and also taking into account the duration of surgery (Nishino, 2013).

Regional anaesthesia was avoided as there was bilateral lower limb weakness, overall muscle rigidity, bradykinesia and postural instability and coagulopathy with deranged INR (Chiew et al., 2023). Patients with Extrapyrimal syndrome have debilitating symptoms, which interfere with their motor tasks, communication, social functioning and day to day activities. This eventually affects quality of life resulting in multiple hospital visits.

There are four types of extrapyramidal symptoms which includes 1) Akathisia, in which a patient feels restless and cannot sit still. 2) Dystonia, in which muscles contract involuntarily. 3) Parkinsonism, where symptoms are similar to Parkinson's disease like tremors at rest in hands and limbs or can be postural. Stiff muscles, difficulty in standing, slow body movements, muscle rigidity and problems with coordination are observed. Also, patients have difficulty in speaking and have soft speech. Patients present with difficulty in swallowing, reduced facial expression, neck tightness and weight loss. 4) Tardive dyskinesia, in which there are involuntary facial movements (Mathews et al., 2005).

Prognosis of EPS varies which can either spontaneously settle or show improvement with adequate treatment. Acute dystonic reactions are usually temporary but persistent tardive dystonia can be for prolonged duration. Acute akathisia may resolve spontaneously or improve with appropriate treatment. Because of the potential risk of aspiration due to the reduced swallowing reflexes, rapid sequence induction was followed and the patient was mainly induced with an inhalational agent. Patients with extra pyramidal syndrome are at increased risk of respiratory arrest due to laryngeal dystonia which may be drug induced. Therefore, it is very essential to take care of necessary medication which patients receive in the perioperative period.

We took the clinical decision of extubating the patient on the basis of her preoperative condition rather than following extubation criteria (Saeed and Lasrado, 2023). The main intention for fast tracking the extubation in this patient with poor nutritional status and electrolyte imbalance was to avoid postoperative ICU associated complications like ventilator associated

pneumonia and other infections which were more likely to occur considering patient's condition. This decision thereby helped in reducing hospital stay of the patient. Appropriate post-operative care of the patient was taken like good physiotherapy, avoiding bedsores, chest physiotherapy, deep vein thrombosis prophylaxis and due wound care dressing regularly.

#### 4. CONCLUSION

Proper clinical evaluation and appropriate anaesthetic management allowed the anaesthesiologist to extubate the patient, who is a known case of extrapyramidal syndrome with poor nutritional status and Glasgow coma scale score.

#### Informed Consent

Written and oral informed consent was obtained from the patient's parents in the study.

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This study has not received any external funding.

#### Conflict of interest

The authors declare that there is no conflict of interests.

#### Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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