

A rare case of postpoliomyelitis quadriparetic patient with severe kyphoscoliosis

To the Editor,
Poliomyelitis is an acute, paralytic viral infection caused by enterovirus. The virus is transmitted through fecal-oral route to lymph nodes as its primary site where it replicates and then enters the bloodstream. Paralytic poliomyelitis globally is on the verge of eradication except for few developing countries.\(^1\) The virus enters central nervous system in 1-2\(^\%\)\(^2\) of cases which may progress to permanent flaccid paralysis, also known as postpolio residual paralysis (PPRP). Quadriparesis occurs in 1.4\(^\%\) and kyphoscoliosis in 12\(%\) of patients of PPRP.\(^{[2,3]}\)

In the modern era, it is very rare to encounter adult patients with quadriparesis and severe kyphoscoliosis following PPRP.

A written informed consent was obtained from patient for scientific publication of this case report along with radiological images.

A 26-year-old female, with a history of severe kyphoscoliosis and neglected limb deformities following PPRP [Figure 1] was scheduled for total abdominal hysterectomy under general anesthesia (GA). She was a diagnosed case of poliomyelitis at the age of 6 months. Ever since then, the patient was nonambulatory and was confined to a wheelchair. She had a past history of pulmonary tuberculosis 12 years back for which she took antitubercular treatment with no relapse.

On physical examination, the patient was short stature, 130 cm height and 28 kg of weight. Neurological examination revealed normal higher function, no sensory deficit, reduced power of 2/5 in upper limbs and absent power in lower limbs. Musculoskeletal examination revealed severe kyphoscoliosis of thoraco-lumbar spine and severe atrophy of limb muscles. There was fixed flexion deformity of both hip joints leading to exaggerated lumbar lordosis. She had normal sensory functions with intact bowel and bladder control. Examination of respiratory and cardiovascular system was unremarkable. Airway examination was normal with normal neck movements and a Mallampati Class 1.

The blood biochemistry was within the normal limits. Chest X-ray revealed severe thoraco-lumbar scoliosis with right-sided curve and Cobb’s angle of approximately 140-150\(^\circ\) [Figure 2]. Arterial blood gas analysis showed pH 7.40, pO\(_2\) 99.8 mmHg, pCO\(_2\) 34.0 mmHg, HCO\(_3\) 20.9 mmol/L, base deficit -4.0 and \(\text{SpO}_2\) 98.2\%. Breath holding time of the patient was 25 s. Patient was unable to perform pulmonary function test (PFT) in spite of repeated explaining. Arterial blood gas analysis showed normal values. Echocardiography was normal with ejection fraction of 60\% with no pulmonary arterial hypertension. Computed tomography scan abdomen showed right ovarian cystic mass with severe kyphoscoliosis and badly rotated spine. Patient preferred GA for the surgical procedure. Patient was premedicated with oral ranitidine 150 mg night before and 2 h prior to surgery.

In operating theater mandatory anesthesia monitoring was established. The patient had inability to lie supine; hence the surgical position was made by keeping pillows under both the

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Figure 1: General physical appearance of the patient showing neglected limb deformities following postpolio residual paralysis
A detailed history during preoperative evaluation should focus on history of sleep apnea, daytime fatigue and snoring and if present, it predisposes such patients to a five times higher risk of apnea in the postoperative period.[5] There was no such history in our patient. Patient’s with PPRP are at an increased risk of aspiration and apnea due to delayed gastric emptying and weakness of pharyngeal and laryngeal muscles.[6-8]

Similarly, severe deformities and prolonged immobilization predisposes these patients to extreme sensitivity of peri-operative medications and their adverse effects.[9] Hence, dose of induction agents, opioids, and inhalational agents were titrated carefully in the present case.[10,11]

During GA, the dose of muscle relaxant was guided with neuromuscular monitoring. Succinylcholine should be used cautiously. However, short acting muscle relaxants like atracurium, mivacurium are preferred.[2,11] Extubation of trachea was done after patient was fully awake with complete reversal of NM blockade so as to avoid respiratory complications, which are quite common in patients with muscle weakness and PPRP.[12]

Cold intolerance is another peri-operative problem commonly seen in such patients.[9] The exact mechanism is not clear, but could be due to loss of vasoconstrictor sympathetic supply or alterations in blood supply to the atrophied muscles.[12] Antihypothermia measures should be used in the peri-operative period.

Regional anesthesia in the present case was not a viable option due to anatomical deformities and patient’s preference for GA. Use of regional anesthesia in these patients needs individualization due to the damaged neurons, increased sensitivity to local anesthetics, technical difficulty and unpredictable spread of the local anesthetic.[2,13,14]

Regional blocks are preferred over opioids to avoid sedation and respiratory depression for postoperative pain relief.[10] Nonsteroidal antiinflammatory drugs and paracetamol are safe and can be used.[12]
Thus to conclude, the anesthetic management of the present patient was challenging, but successful due to meticulously executed peri-operative care.

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