

General Anesthesia in a Patient with Leprosy: A Rare Case

 Meltem AKTAY İNAL,^a

 Sedef Gülçin URAL^a

^aClinic of Anesthesiology and Reanimation,
Osmaniye State Hospital,
Osmaniye, TURKEY

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Correspondence:

Sedef Gülçin URAL

Osmaniye State Hospital,

Clinic of Anesthesiology and Reanimation,

Osmaniye, TURKEY

sedef_uzunkaya@hotmail.com

ABSTRACT Leprosy is a chronic granulomatous infection caused by *Mycobacterium leprae* which affects skin and nerves. It is common in developing countries which have low socioeconomic and inadequate nutritional status, conditions related to poor hygiene and crowded family environment. Patients may have peripheral neuropathy, dysautonomia and autonomic involvement in cardiovascular and respiratory system. In this case report, we present the management of general anesthesia in a patient with leprosy undergoes surgery for multinodular goiter.

Keywords: Leprosy; general anesthesia; dysautonomia

Leprosy disease is a chronic infectious disease caused by *Mycobacterium leprae* which affects skin and nerves.^{1,2} Peripheral neuropathy and multiorgan involvement are major manifestations. Dysautonomia and side effects due to antileprotic drugs may lead multiorgan failure.³

There are insufficient studies about anesthesia management patients with leprosy. In this case report, we aimed to present the management of general anesthesia in a patient followed up for leprosy and scheduled to undergo total thyroidectomy because of multinodular goiter.

CASE REPORT

A forty-two-year-old male patient with a height of 173 cm and weight of 75 kg admitted to our hospital for preoperative evaluation. His leprosy was detected 5 years ago and has been treating regularly. Physical examination showed hyperpigmented lesion on the right cheek, nasal deformity and crusting, deformity of bilateral upper and lower extremity and sensorial loss. His mallampati score was grade 3. The patient who had no restricted neck movement was using dapson 100 mg (three times a day), rifampicin 300 mg (once a day), intranasal fluticasone propionate 50 mcg (twice a day). There was right bundle branch block in his electrocardiography (ECG). He was using one packet of cigarette per day. He consulted with the cardiologist, pulmonologist, dermatologist and otorhinolaryngologist. His complete blood

count and blood chemistry tests were normal. His ejection fraction (EF) was 60%. After consultations and physical examination, the patient's American Society of Anesthesiologists (ASA) classification was in as grade 2. His preoperative noninvasive blood pressure (BP) was 121/70 mmHg, heart rate was 76 bpm, blood oxygen saturation (SpO₂) was 99%.

After he was transported to the operating room, monitorization for ECG, SpO₂ and BP was done. After iv cannulation was performed with 16 G cannula, we administrated 3 mg midazolam for premedication. For anesthesia induction 2 mgkg⁻¹ propofol, 100 mcg fentanyl, 1 mgkg⁻¹ lidocaine, 0,6 mgkg⁻¹ rocuronium were used. Then, patient was intubated in first attempt with endotracheal tube (number 8) by using Macintosh blade. His mean blood pressure was 110 mmHg after the intubation and 30 mg esmolol was administrated. Esmolol was preferred as it decreases myocardial work and rapidly increases coronary blood flow. Perioperative 10 mlkg⁻¹ ringer lactate solution was given. Patient was extubated with 2 mgkg⁻¹ sugammadex. When compared with neostigmine and anticholinergic drugs, recurarization was performed with sugammadex, as it provided rapid recovery and did not lead to muscarinic side effects. Total operation time was 2 hours. The patient was taken to the postoperative care unit following the operation and transferred to the general surgery service. Written informed consent was obtained from patient as to share case report.

DISCUSSION

Leprosy is a systemic disease that causes peripheral neuropathy and dysautonomia. Cell mediated immune response decreased because of suppression of T-cell response.⁴ Additionally, cardiac and respiratory dysautonomia and autonomic involvement may be seen. Bradycardia, hypotension, cardiac arrest, ECG changes and arrhythmias are remarkable manifestations. Close hemodynamic follow up must be done due to cardiac dysautonomia during perioperative manipulations such as intubation, extubation and anticholinergic drug delivery.^{5,6} Respiratory

dysautonomia causes impairment of respiratory functions, reduction in inspiration time and suppression of cough reflex and as a result of these, it increases post-operative complications. Nasal obstruction and vocal cord involvement can be seen at the late stages of leprosy and these findings must be evaluated for difficult intubation.^{7,8} Autonomic involvement causes orthostatic hypotension, baroreflex disorder, postprandial hypotension and impairment of valsalva response.⁶ Esmolol hydrochloride is a short-acting β_1 -adrenoceptor antagonist and class II antiarrhythmic. This aryloxypropanolamine is rapidly hydrolyzed to a low activity acid by red cell esterases and has a half-life of only 9 minutes. It is used in the acute management of supraventricular tachycardias, hypertension and myocardial infarction, and is an option for suppression of the hypertensive response to laryngoscopy and intubation.⁹ After administering the bolus doses, the peak effect on the heart rate, and the blood pressure, begins within the first and second minute respectively.¹⁰ Since the peak heart rate and the average arterial pressure were too high, we administered a 30 mg esmolol to the patient after intubation and achieved a positive result very quickly. Our patient didn't have cardiorespiratory dysautonomia, but we followed up the patient closely for potential complications.

The use of neostigmine, a cholinesterase inhibitor, is a standard procedure for the reversal of neuromuscular blockade; however, the side effects, such as slowing heart rate, increased secretion, bronchospasm, make its use more difficult.¹¹ Anticholinergics, including atropine and glycopyrrolate, which are used to prevent these side effects, increase the frequency of arrhythmia, and cause blurred vision and sedation.¹¹ Complete reversal of the effect of nondepolarizing neuromuscular blockers at the end of general anesthesia shortens recovery times and may prevent respiratory complications in the early postoperative period. The superiority of sugammadex neostigmine has been known for its effectiveness in reversing the neuromuscular blockade effect. There are studies in the literature showing that sugammadex

is more effective than neostigmine in reducing the effect of rocuronium.^{12,13} We preferred sugammadex for extubation by considering the possible complications in our patient.

Changes in drug metabolism and clearance as a result of hepatorenal dysfunction in leprosy causes prolongation of awakening period after anesthesia.³ Drugs used for leprosy (Dapson, Rifampisin, Klofazimin) have multiple side effects that affect many systems. Dapson may cause hemolytic anemia, methemoglobinemia, agranulocytosis, hepatitis, peripheral neuropathy, psychosis and leprosy reaction.¹⁴ Our patient had normal hepatic and renal functions. His leprosy was detected 5 years ago, he has been using dapson since then and we didn't detect any side effects. Because hypotension and urinary retention are observed commonly, in long-standing diseases, spinal and epidural anesthesia must be performed carefully. Leprosy patients tend to have neural damage and neuropathy. These manifestations should be considered during regional blockage. Sahu et al. reported a successful general anesthesia administration to a leprosy patient with renal cell carcinoma.³ There are also successful regional anesthesia methods in the literature.¹⁵

Careful preoperative evaluation, sufficient preoperative preparation, close follow up and monitoring are important steps of anesthesia induction in leprosy patients with respiratory and

cardiac dysautonomia. In addition to that, multiorgan dysfunction and side effects due to antileptotic drugs should be kept in mind. We think that general anesthesia is a safe procedure if the precautions mentioned above are carefully considered perioperatively.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Meltem Aktay İnal, Sedef Gülçin Ural; **Design:** Meltem Aktay İnal, Sedef Gülçin Ural; **Inspection/Consultancy:** Meltem Aktay İnal, Sedef Gülçin Ural; **Data Collection and/or Processing:** Meltem Aktay İnal, Sedef Gülçin Ural; **Analysis and/or Comment:** Meltem Aktay İnal, Sedef Gülçin Ural; **Resource Screen:** Meltem Aktay İnal, Sedef Gülçin Ural; **Combined Article:** Sedef Gülçin Ural; **Critical Investigation:** Meltem Aktay İnal, Sedef Gülçin Ural; **Resources and Fund Provisions:** Meltem Aktay İnal, Sedef Gülçin Ural; **Materials:** Meltem Aktay İnal, Sedef Gülçin Ural.

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