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Regional Anesthesia for Laparoscopic Surgery in Patient with Past History of Inhalation Burn: A Case Report

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Abstract **Case Report**

***Background*:** Recently, laparoscopic surgery is preferred because it reduces the invasiveness and recovery time, and general anesthesia is generally performed. However, depending on the patient's medical history, general anesthesia can result in serious side effects. ***Case*:** A 44-year-old woman with a past history of inhalation burns was scheduled for Laparoscopic salpingo-oophorectomy. Considering the patient's history, it was decided that regional anesthesia would be more appropriate, and combined spinal-epidural anesthesia was performed. After anesthesia, the pain block level was about Thoracic level 2 and the operation was completed without any complaint of pain. ***Conclusions*:** Regional anesthesia can be a sufficient alternative for patients who are expected to have serious complications due to general anesthesia or with respiratory mediated infectious and should be considered in patients who think that regional anesthesia is more beneficial.

Keywords: Regional Anesthesia, Laparoscopy, Inhalation Burn, Acquired Subglottic Stenosis, Bronchiectasis.

INTRODUCTION

Recently, laparoscopic surgery is preferred because it reduces the invasiveness and recovery time, and general anesthesia is generally performed during laparoscopic surgery [1]. However, depending on the patient's medical history, general anesthesia can be burdensome, and if there is a high possibility of serious side effects, other anesthesia methods can be considered. The case presented below is also such a case.

CASE REPORT

Written informed consent was obtained for the publication of this case report. A 44-year-old woman was scheduled for Laparoscopic salpingo-oophorectomy. It is common to perform general anesthesia in the case of laparoscopic surgery, but the patient had a history of inhalation burns 8 years ago.

After extubation, dyspnea was occurred severely, and reintubation was performed. To check the patient`s airway state, consultation with an otolaryngologist was performed and subglottic stenosis and vocal cord stricture were found. Otolaryngologist warned that re-intubation and tracheostomy were possible and the risk of general anesthesia was high. The PFT result was FVC 2.39L – FEV1 1.59L – FEV1/FVC 67%, and there was a lot of secretion due to a lack of mucociliary clearance on the airway and endobronchial secretion with bronchial wall thickening and diffuse bronchiectasis was found in both lung with Chest Computed Tomography (Chest CT).

Considering the patient's history, it was decided that regional anesthesia would be more appropriate, and combined spinal-epidural anesthesia was performed. The procedure was performed aseptically, and 0.5% Marcaine heavy 10.5 mg with Fentanyl citrate 10 mcg was injected into the subarachnoid space at Lumbar 3-4 Level. The Loss of resistance was checked at 4cm and the catheter fixation level was at 13cm. After anesthesia, the temperature and pain block level were about Thoracic level 8 immediately and when checked after about 10 minutes, the pain block level rose to Thoracic level 2.

Before the incision, patient complained of discomfort due to the large amount of secretion, so 0.2mg of glycopyrrolate was administered. The

operation was started with O2 administered at 3 L/m using a nasal prong, and no specific pain was reported at the time of incision and insertion of trocar. About 20 minutes after CO2 gas injection, patient complained of right shoulder pain due to stimulation of the phrenic nerve, and the pain subsided after analgesic fluid (acetaminophen 1g + ibuprofen 300mg) was administered.

The ovary was safely removed without any complaint of pain, and the operation was completed after suturing. The total operation time was 107 minutes, and the operation was completed 132 minutes after drug injection. After coming to the recovery room, nausea was present and Metoclopramide 10mg was administered. Significant pain that required pain medication was not complained. The anesthesia level dropped to T11, and as a result of ABGA administered with oxygen at 3L/m by nasal prong, pCO2 was 48.9mmHg with 66.9mmHg of pO2, and sO2 92.2% were found. When followed up 3 hours after moving to the hospital room, there were no specific symptoms, and even after that, patient was safely discharged without complications.

DISCUSSION

Subglottic stenosis, bronchiectasis, and bronchiolitis obliterans may occur as a long term complication after Inhalation burn [2]. The patient also showed subglottic stenosis and vocal cord stricture on laryngoscopy in preoperative evaluation, and diffuse bronchiectasis was confirmed on Chest CT [Figure 1]. Hoarseness was also severe at the time of the conversation.

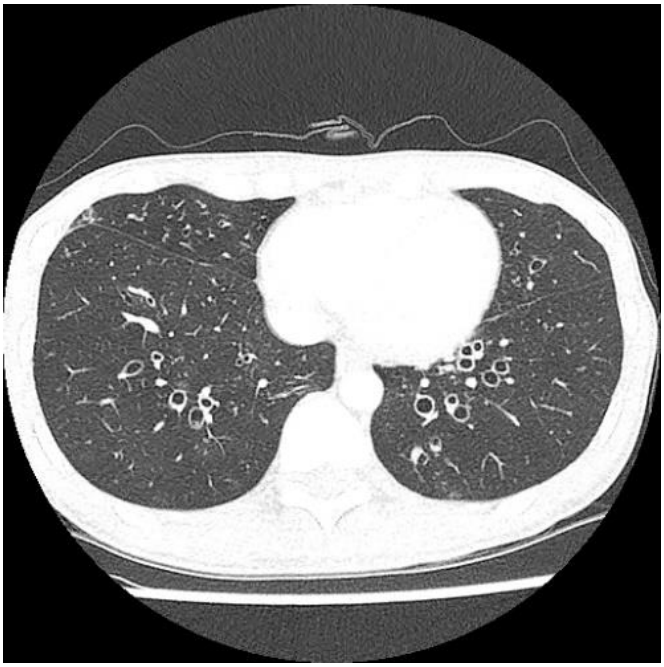

Figure 1: Finding of diffuse bronchiectasis on Chest CT

In addition to stimulation of the airway by tracheal intubation or inhaled anesthetics, the risk of intubation failure and tracheostomy due to incomplete muscle relaxation reversal and arousal could not be overlooked. Therefore, considering airway management and the risk of postoperative pulmonary complications, it was changed to regional anesthesia.

Regional anesthesia can effectively minimize airway stimulation resulting from endotracheal intubation and potential complications such as intubation failure. This anesthetic technique not only alleviates postoperative discomfort and recovery time but also the likelihood of respiratory infection in individuals with underlying respiratory pathologies [3, 4]. Recently, viral pathogens like COVID-19 have also resulted in reduction of the risk of both transmission and postoperative pulmonary complications with regional anesthesia [5].

Patient complained of anxiety about laparoscopic surgery with regional anesthesia. In general, sedation drugs such as propofol or midazolam are used with regional anesthesia. However, due to airway problems of this patient, avoidance of drugs that could cause respiratory depression was considered [6, 7]. Instead, before and during the surgery, anesthesiologist was next to the patient to fully explained the patient's condition and feel stable. Surgery was performed by playing music to calm the mind instead of sedatives, and fortunately, there was no any severe anxiety or the fluctuation of vital sign.

Maintaining a laparoscopic pressure high could potentially result in patients experiencing discomfort such as shoulder pain or respiratory

difficulties during the procedure. Therefore, we injected the carbon dioxide gas slowly and maintained the pressure at approximately 10mmHg [5].

After gas injection into the abdominal cavity, the patient complained of pain in the right shoulder. Among other cases, there was a patient who was changed to general because of shoulder pain, but fortunately, our patient's pain improved after administering analgesics. It is known that such pain responds well to analgesics, so it should be considered first rather than changing to general anesthesia [6].

The patient's pCO2 value remained high at 48.9 in the recovery room after surgery due to the absorption of carbon dioxide gas injected during surgery. For safety, voluntary breathing regularity was monitored in the recovery room by checking the end-tidal carbon dioxide (Etco2) value.

CONCLUSION

In conclusion, regional anesthesia can be a sufficient alternative for patients who are expected to have serious complications due to general anesthesia or with respiratory mediated infectious diseases that may occur in the future, such as COVID 19 and should be considered in patients who think that regional anesthesia is more beneficial [8, 9].

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