Anesthesia management of a transgender patient with HIV: Case report

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Abstract
Transgender individuals are people whose gender identities differ from the gender they were assigned at birth. This case report aims to present the anesthesia management of HIV-positive transgender patient admitted to the plastic surgery clinic for mammoplasty and rhinoplasty operation. Transgender individuals may have difficulties in anesthesia management due to their clinical characteristics. Anatomical, pharmacological, and psychological aspects should be carefully examined in terms of anesthesia before the surgical procedure. In addition, a multidisciplinary approach will benefit both anesthesia management and postoperative care.

Keywords
Transgender Patients; Anesthesia; Perioperative; Surgery; Hormone Therapy
Introduction
Transgender individuals are people whose gender identities are incompatible with and different from the gender they were assigned at birth. Approximately 25 million people (0.5%-1.3%) worldwide have been identified as transgender according to recent research [1]. The number of transgender people and their awareness is continually increasing together with the numbers of various treatments and surgeries performed to harmonize transgender individuals physically and mentally with their gender identities. Accordingly, male-to-female sex reassignment surgeries include augmentation mammoplasty and vaginoplasty, clitoroplasty, and/or vulvoplasty, through which the male genital organ is removed and the female genital structure is formed, as well as nongenital/nonbreast surgeries (thyroid cartilage reduction, voice feminizing procedures). Female-to-male sex reassignment surgeries include bilateral mastectomy, scrotoplasty, and testicular prosthesis implantation [2].

Treatments received by and interventions performed for transgender individuals may all affect the clinical evaluation of the patient in the perioperative period. Therefore, a detailed, sensitive, and unique anesthesia evaluation should be performed before anesthesia, and caution should be considered in terms of potentially difficult airways, interactions of the drugs used with each other, difficulties in estimating perioperative risk, and the need for perioperative care. It should be kept in mind that secondary gender characteristics may be present throughout a developmental spectrum in patients receiving hormone therapy when examining these patients and that infectious diseases and clinical effects may be observed, as in the case presented here.

This case report aims to present the anesthesia management of a 23-year-old HIV-positive transgender patient admitted to a plastic surgery clinic for mammoplasty and rhinoplasty operation.

Case Report
We performed a preoperative evaluation of a 23-year-old HIV-positive transgender individual with the XY genotype who was scheduled for mammoplasty and rhinoplasty in a plastic surgery clinic and had not undergone operation on the urogenital system. It was learned that the patient had previously undergone abdominal surgery in another center after trauma and that there were no surgical or anesthesia-related complications during and after that operation. It was also learned that the patient used estradiol, progesterone, and Androcur as well as emtricitabine, tenefoxi disoprol, and dolutegravir for the treatment of HIV in the perioperative period. Complete blood count, coagulation parameters, blood glucose and blood electrolyte values, kidney function tests, and liver function tests of the patient were all normal. Follicle-stimulating hormone level of <0.2 IU/L (reference range: 1.27-19.26 IU/L), luteinizing hormone level of <0.2 IU/L (1.24-8.62 IU/L), progesterone level of 0.17 µg/L (0.14-2.26 µg/L), estradiol (E2) level of 68.8 µg/L (1-47 µg/L), dehydroepiandrosterone level of 177 µg/L (80-560 µg/L), and total testosterone level of 0.17 µg/L (2.59-8.16 µg/L) were determined according to the reference ranges for the male gender in additional laboratory tests. Obstetrics and gynecology as well as psychiatry and endocrinology consultations were requested. An informed consent form was obtained from the patient. The ASA score was considered to be 2.

The patient, who was premedicated with 1 mg of atropine (IM) and 2 mg of midazolam (IM) in the preoperative period, was taken to the operating room approximately 10 minutes later from premedication. Following standard anesthesia monitoring (ECG, blood pressure, and saturation), oropharyngeal intubation was performed successfully in the first attempt using a number 8, straight, cuffed endotracheal tube after 5 mg of midazolam, 100 µg of fentanyl, 200 mg of propofol, and 50 mg of Esmeron (rocuronium bromide) were administered in anesthesia induction. The mean arterial pressure returned to the normal range after intervention with 5 mg of ephedrine with a 30% decrease in mean arterial pressure compared to the baseline values before induction, whereas heart rate, peripheral oxygen saturation, and end-tidal carbon dioxide level remained within normal ranges throughout the operation after anesthesia induction. Sevoflurane (0.8 MAC) and nitrogen protoxide/oxygen (50%/50%) were used to maintain anesthesia. The patient was extubated with 1 g of paracetamol (IV) and 30 mg of pethidine (IV) and sent to the recovery unit and then to the plastic surgery service without any problems at the end of the operation for postoperative analgesia.

Discussion
The number of surgeries and treatments being applied to harmonize sex-related physical and mental gender identities is increasing significantly with the increasing tendency to accept transgenderism around the world. Therefore, anesthesia practitioners need to know the clinical effects of interventions, preoperative risk factors, and possible drug interactions of such cases. Hospitals can be traumatic places for transgender individuals. The place of preoperative evaluation being a culturally appropriate environment where the patient feels safe and welcomed will greatly affect the reliability of the anamnesis to be given. Transgender individuals may have different names or genders than the ones reflected in their legal identities. This can lead to a decrease in mutual trust, similar to incorrect statements or disregard of the patient’s preferences. One of the most important parts of preoperative evaluation is a detailed physical examination without considering the gender presentation of the individual. It would be useful to have an accompanying person suitable for the patient’s gender to be determined by them when performing physical examinations, if possible. It should be kept in mind that secondary gender characteristics may be present, especially in patients receiving hormone therapy.

It is very valuable to classify possible anesthesia risks with laboratory tests performed before the procedure to determine anesthesia management and to determine postoperative care. It is important to understand how possible hormone therapy intake will affect these values when interpreting laboratory results. The effects of testosterone and estrogen therapy on blood chemistry may vary depending on the medication and duration of treatment. Hormone therapies may decrease hemoglobin, hematocrit, and creatinine levels in transgender women. In addition, attention should be paid...
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...to transgender women because their levels of spironolactone, serum potassium, and creatinine, which are frequently used to suppress testosterone production, are affected [3]. In addition, transgender women receiving hormone therapy have a higher prevalence of venous thrombosis, myocardial infarction, other cardiovascular diseases, and type 2 diabetes compared to the general population [4].

The risk of venous thromboembolism (VTE) may be higher in these patient groups due to reasons such as smoking, estrogen-related protocols, comorbid cancer diagnoses, duration of surgery, inactivity, and coagulation disorders [5]. It is recommended that cross-sex hormone therapy be discontinued 2 weeks before major surgery and resumed after 3 weeks of complete mobilization to reduce the risk of VTE in transgender women with cardiovascular risk factors. In addition, intraoperative VTE prophylaxis in the form of subcutaneous heparin and the use of consecutive compression devices may be considered [5].

Studies have shown that HIV prevalence is higher among transgender individuals. This may affect multiple systems in anesthesia management associated with HIV infection, such as hepatic and renal function, coronary artery disease, pulmonary hypertension and cardiac abnormalities, respiratory complications, drug allergies, and hematological abnormalities. It should also be kept in mind that general anesthesia has an immunosuppressive effect and that the anesthetic drugs to be used may interact with antiretroviral agents through cytochrome p450 induction [6].

Vocal cord injury and tracheal stenosis may develop depending on the outcome of these procedures, especially in patients undergoing procedures related to the face and vocal cords, such as laryngoplasty and cordoplasty for transgender women. Such conditions are important details that directly affect intraoperative airway management and require caution during intubation. Anesthesiologists should be prepared for possible risks by making the necessary preparations before the operation considering the possibility of a potentially difficult airway [7].

Associated psychiatric conditions, especially depression and anxiety, are more common in the transgender population than the general prevalence. In addition, pharmacological therapies and possible drug interactions may be seen. Selective serotonin reuptake inhibitors, serotonin, noradrenaline reuptake inhibitors, and monoamine oxidase inhibitors all have well-documented anesthesia-related interactions [8].

There are limited data on the effects of hormonal therapy received by transgender individuals on anesthetic drug pharmacology and drug delivery algorithms. This will affect the calculation and administration of anesthetic drugs that require gender selection in anesthesia application models used for drug infusions. The use of anesthesia depth monitoring approaches such as the bispectral index may help in this case [2]. This should also be taken into consideration in calculations since the 'ideal body weight' calculation used for drug doses varies by gender. There are no internationally recognized guidelines for the administration of anesthesia to transgender patients in the intraoperative period established with comprehensive information obtained from adequate and extensive studies. Anesthesia management should proceed in line with accepted national and regional guidelines in such cases. It is recommended to carefully consider current drug interactions as mentioned and to monitor patients receiving estrogen therapy for deep vein thrombosis and thromboembolism. Prophylactic anticoagulation and varicose vein stockings can be evaluated in coordination with the surgical team [9]. Steroid administration against estrogen withdrawal syndrome should be taken into consideration in patients receiving long-term hormone therapy by obtaining opinions from endocrinologists.

The postoperative period is a very troublesome time in terms of postoperative pain, anxiety, and depression in addition to the clinical features present among transgender patients. Pain management is particularly important. Psychological factors such as depression, fear, and anxiety as well as medical factors such as hormone-induced osteoporosis, previous surgeries, and impaired immune system contribute to postoperative and chronic pain in these patient groups. Attention should be paid to the use of opioids in postoperative pain management, with awareness of the high rate of drug addiction among transgender patients [10].

For anesthetists, the perioperative management of transgender individuals can pose challenges. Anatomical, physiological, pharmacological, and psychological aspects of anesthetic care must be carefully considered in the pre-surgical evaluation. Paying attention to patient privacy and gaining trust is important in the detailed evaluation to be made and in providing safe and optimized care. In addition, a multidisciplinary approach will be beneficial in both anesthesia management and postoperative care. We believe that anesthetists should increase their awareness and knowledge for this special population.

**Scientific Responsibility Statement**

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

**Animal and human rights statement**

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

**Conflict of interest**

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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