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Case Report Open Access

Mask Phenomenon Following Robot-assisted Prostatectomy: A Rare Complication due to Trendelenburg Position

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Summary

At the present time, the frequency of less invasive robot-assisted surgical procedures is progressively increasing. An increased number of cases have enabled the ability to observe rare complications in addition to common complications. In the current case, the authors aimed to present a benign, but rare, anesthetic complication, the "mask phenomenon," which was induced by bronchospasm and severe cough developing on the basis of facial edema that occurred in the steep Trendelenburg position. This paper not only reports the importance of early recognition of complications of steep Trendelenburg for anesthesiologists; but also serves as a reminder to physicians caring for postanesthesia patients in the surgical ward after robotic surgery.

Keywords: Mask phenomenon; Robot-assısted prostatectomy; Anesthetıc complıcatıon

Introduction

Injuries caused by position during the perioperative period are one of the risk factors for anesthesia and surgery. However, the Trendelenburg position, which is especially used in robot-assisted urological surgeries, might cause unknown morbidities [1]. Trendelenburg position and pneumoperitoneum together with facial and upper respiratory tract edema might cause venous stasis in the head and neck region [2]. The mask phenomenon is a rare clinical picture that occurs in the facial region in particular, due to laceration in the dermis capillaries caused by increased intrathoracic and intraabdominal pressure [3].

The current study aimed to present a rare, but benign, complication, the "mask phenomenon," which was induced by position, facial edema and bronchospasm during the postoperative period following robot-assisted prostatectomy. We not only wanted to report the importance of recognition of this infrequent complication for anesthesiologists; but also to emphasize it as a reminder to physicians caring for postanesthesia robotic patients in the surgical ward.

Case

A 57-year-old male patient undergoing robot-assisted prostatectomy was evaluated during the preoperative period and his history revealed diabetes mellitus (DM), hypertension (HT), and coronary artery disease (CAD) and drug usage for these diseases. BMI (body mass index) was within normal limits. The patient's hemogram, biochemical results, ECG, and chest X-ray were normal. After routine monitorization with ECG (electrocardiogram), pulse oxymeter and non-invasive blood pressure. After adequate preoxygenation, general anesthesia was induced with a combination of 1 mg/kg lidocaine, 4-6 mg/kg thiopenthal, fentanyl (100 mcg), and 0.6 mg/kg rocuronium endotracheal intubation was performed. The trachea was intubated and general anesthesia was maintained using a combination of oxygen and air (1:1), desflurane (5% to 6%), and remifentanil. Remifentanil infusion was started after propofol induction with 0.1 $\mu g.kg^{-1}.min^{-1}$ dosage and it was titrated between 0.1-0.5 $\mu g.kg^{-1}.min^{-1}$ levels. All patients were mechanically ventilated with a tidal volume of 6-8 $ml.kg^{-1}$ and a respiratory rate of 12-16 $breaths.min^{-1}$. End-tidal CO_2 concentrations of 30-35 mmHg were considered as adequate. Invasive arterial monitorization was performed after anesthesia was achieved. The patient was stabilized with protection pads in the upright Trendelenburg position at a 30^0 angle. Following the surgery which was completed without complications after 6 hours and 25 minutes, the patient was extubated after his spontaneous respiration was adequate, by sugammadex, for shortening the recovery time. However; afterwards the oxygen saturation decreased. Bronchospasm was detected in the patient. One hundred percent oxygen was administered via the face mask and 1 mg/kg prednisolone was administered intravenously. As the bronchospasm continued, 200 mg/100 ml aminophylline was administered intravenously. After the patient's oxygen saturation and general condition improved, the patient was transported and monitored in the recovery unit. Cold vapor and O_2 administration continued. The patient was stable at the end of the follow-up and transferred to urologic service with recommendations. At the postoperative sixth hour, petechial eruptions in various sizes, not becoming pale underpressure, were observed on the face, especially in the periorbital region and extending towards the scalp. There were no petechial eruptions or erythematous plaque in other regions of the body. Dermatology consultation was requested. The diagnosis of "petechiae secondary to valsalva" was recommended by dermatology. Hemogram, PT, PTT, INR, and bleeding time were normal. The next day, petechiae were pale and absent without any medication.

Discussion

Facial petechiae can develop due to rheumatologic, dermatologic, infectious, and traumatic reasons [4]. If there is an underlying vascular, coagulopathic, or neoplastic condition, an emergent treatment approach is mandatory. However, a small number of cases with facial edema and petechia due to benign factors, such as cough, vomiting, and valsalva maneuver have been reported [4-6]. Epileptic convulsion is another benign cause of purpura on the face [7,8]. This condition

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has been defined as the "mask phenomenon" by Alcalay et al. [5]. It is thought to be caused by lacerations in the skin capillaries that develop due to increased intraabdominal and intrathoracic pressure. It is a rare and reversible complication and recovers without treatment on its own.

Anesthetic management in robot-assisted radical prostatectomy operations is primarily related to the pneumoperitoneum in the Trendelenburg position. This combination affects the cerebrovascular, respiratory systems, and hemodynamic balance. The range of possible nonsurgical complications is quite large [9]. In various case series, cardiovascular complications were observed at a rate of 0-0.56% [10], corneal abrasion was observed at a rate of 3%, and pulmonary embolism was observed at a rate of 0.2% [11]. Complications such as burns due to gastric reflux [12] and compartment syndrome in the lower extremity can also be observed [13].

The authors of the current study believed that facial edema, bronchospasm and severe cough, which developed after extubation were caused due to Trendelenburg position following prolonged robot-assisted prostatectomy, thus facial purpura developed in the postoperative period. O'Malley and Cunningham demonstrated that pneumoperitoneum and steep Trendelenburg increased intraabdominal, thus intrathoracic pressures [14]. Besides, bronchospasm related to the impairment of respiratory mechanics, might lead to coughing at the extubation period. All of these might probably play an important role in minor hemorrhage associated with facial purpura, as seen in our patient.

Adısen et al. thought that the gag reflex and severe cough that were induced by endoscopy probe caused facial purpura developing after endoscopy [3]. Similar to the current patient, they also found normal coagulation tests in their patient. There are publications in the literature that report facial benign purpura that developed following upper gastrointestinal endoscopy [15,16]. Ozaslan et al. reported that multiple petechia, diffuse edema, and subconjunctival hemorrhage developed following endoscopy without sedation in a 31-year-old patient without any systemic disease, and laboratory tests were normal [17].

Although the mask phenomenon is not believed to be a severe complication, it should be kept in mind that benign complications are rarely witnessed in cases in which intrathoracic and intraabdominal pressure increase due to bronchospasm, severe cough, and vomiting. In conclusion, this phenomenon is a self-limited condition with excellent prognosis and simple management. In robotic assisted urological surgery; the anesthesiologist must be ready against potentially serious complications; as a result of steep Trendelenburg positioning, in addition to frequently encountered ones; as creation of pneumoperitoneum, and difficult access to the patient. Teamwork and communication among surgeons, anesthesiologists and clinicians may minimize complications and provide better understanding about the patient to improve patient outcomes. Both robotic surgeons and clinicians must be provided with an understanding that any patient who is otherwise well has the potential for this phenomenon, which is of anesthesiologic relevance, even late in the postoperative period.

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