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Original Research Paper

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ANESTHETIC MANAGEMENT OF A PATIENT UNDERGOING ROBOTIC ASSISTED LAPAROSCOPIC NEPHRECTOMY FOR NON-FUNCTIONING LEFT KIDNEY.

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ABSTRACT Robotic assisted laparoscopic surgeries are a recent advancement in minimal access surgeries that guarantee faster recovery and minimal life altering choices to the patients. However, the advent of robotic laparoscopic surgeries has placed and increasing amount of responsibility on the anaesthesiologist to maintain intra-operative stability as robotic procedures have a unique set of general consideration and their own plethora of physiological changes in the patient. This case repost describes the anaesthetic management of a 57-year-old Female patient who underwent Robotic assisted laparoscopic nephrectomy of a non-functioning left kidney.

KEYWORDS :

CASE REPORT

57-Year-old female was admitted with left sided abdominal pain. She was investigated and diagnosed to have a Left Non Functioning Kidney with multiple calculi causing obstruction. She was planned for Robotic assisted laparoscopic nephrectomy. The patient was a known case of systemic hypertension and was on T. Amlodipine 5mg BD. She did not have any other significant history. She did not have symptoms of chronic kidney disease or any other comorbidities.

Pre-operative Assessment: Her pre-operative assessment was done in the anaesthesia clinic. Her blood workup such as CBC, Renal Function Test, Liver function test were all within normal limits. Her Electrocardiogram revealed left ventricular hypertrophy suggesting long standing hypertension. Her Echocardiography was well within normal limits except for concentric LVH with EF of 58%. Patient was classified under ASA Grade II

Airway Examination: Adequate Mouth opening, Modified Mallampati score Grade 2, Thyromental distance 7.2 cm and Upper lip bite test Class 2, Normal neck movements.

Induction And Maintenance: Patient was pre-medicated with T Alprazolam 0.5mg and T Pantoprazole 40mg P/o on the night before surgery. On the day of the surgery patient was premedicated with Inj Midazolam 0.05mg/Kg Iv stat and Inj Glycopyrrolate 0.01mg/kg iv stat. She was then induced with Inj Fentanyl(1mcg/kg), Inj Propofol (2mg/kg) and Inj Atracurium (0.5mg/kg). Size 7.5 armoured endotracheal tube was introduced and secured after confirmation with waveform capnography and five-point auscultation. Following induction Invasive lines such as Central venous line in left Internal Jugular vein and Right Radial artery was cannulated with arterial cannula and transduced for real time blood pressure monitoring to watch for fluid shifts or sudden hemodynamic changes.

Patient was then positioned in the right lateral kidney position and all pressure points were padded. After ensuring secure positioning and good ETT Trace, the surgeons proceeded to paint, drape and introduce the trocar and mount the Robotic arms(CMR Surgical, The Versius® Surgical Robotic System). The patient was also positioned in 15° Trendelenburg to facilitate ease of surgical access. Pneumoperitoneum was created and hemodynamic changes to pneumoperitoneum were attenuated with Inj Fentanyl 0.5mcg/Kg Dose

The patient was ventilated with a mixture of O_2 and N_2O at a ratio of 33% and 66% and inhalation agent Isoflurane maintained at a MAC of 0.9-1.1. Inj Dexmedetomidine 0.5mcg/kg/hr was started and continued till the deflation of pneumoperitoneum. Inj paracetamol 20mg/kg iv and Intermittent Bolus of fentanyl at 0.5mcg/kg was administered for Intra-operative analgesia. Fluid resuscitation was goal directed to maintain a PPV of less than 10. At the end of the surgery, an arterial blood sample was sent to assess for normocapnia and patient was then Extubated after regaining complete consciousness following neuromuscular blockade reversal administered when the TOF ratio was 0.8. Hemodynamic status was stable throughout the procedure.

Post-operative Management: The patient was observed post-operatively in PACU for 24 hours. She was restarted on oral fluids 4 hours following surgery and ambulated 8 hours after the surgery. Post-operative analgesia was multimodal in nature involving Inj Paracetamol, Inj Ketorolac and A Transdermal fentanyl patch(25mcg/hr).

DISCUSSION

The advent of the robotic surgeries are gaining traction Due to a robot's movements resembling a human wrist, which allow a surgeon to operate accurately at the surgical site from a distance, robotic-assisted surgeries are becoming more and more common. Hence, surgeries in a small, enclosed area like the retroperitoneum are best suited for the robotic approach.

However, the steep Trendelenburg position, physiological effects of pneumoperitoneum, patient posture, hypothermia, limited access to the patient, venous gas embolism, and subcutaneous emphysema are all critical concerns for the anaesthesiologist during the robotic procedure. Hence meticulous care is taken in positioning the patient was also padding the injury prone areas to avoid injury from the robotic arms.

The right lateral kidney position combined with the Trendelenburg is prone to causing V/Q mismatch, decreased Compliance, increased peak airway pressures, atelectasis and might precipitate oedema of the dependant lung and the

upper airways. The Patients in the Trendelenburg position are often insufflated with CO_2 while they are between 15 and 20 degrees, during which lung compliance can drop by more than 50%, and pulmonary capillary wedge pressure and mean pulmonary arterial pressure can also drop. There is also increased CO_2 absorption that might be negated by hyperventilation which is again difficult in this scenario due to the changes brought on by the positioning of the patient.

Hence care was taken in fluid administration to replace the adequate amounts of fluid and avoidance of hypotension. The same amount of concern was maintained for the restrictive administration of fluid to not let the renal blood flow be compromised. Post operative oliguria which is a common occurrence after urologic procedures as patients' relative volume depletion frequently necessitates fluid boluses to support both normal hemodynamic parameters and urine output. For urologic patients, this means that a thoroughly thought-out fluid management approach must include the postoperative period to guarantee proper renal function and volume status. The securing of the central line was also a prudent action enacted on the part of the anaesthesiologist to always ensure IV access to the patient. In addition, the use of robotic systems can increase the overall surgical time traditionally performed by laparoscopy or laparotomy, thus increasing the anaesthetic exposure time. Collaboration and communication among specialists, medical caretakers, and anaesthesiologists are basic to play down complications, and improve surgical conditions and patient outcomes.

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