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Laparoscopic Appendicectomy performed under Epidural Anesthesia in an IHD Patient

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Abstract: *We present a case of 55 year old male patient a known case of NIDDM, Hypertension, IHD, CVA and BA who presented with appendicular perforation for emergency laparoscopic appendicectomy. In this case we have tried to discuss the challenges of performing laparoscopic surgery in a multiple comorbid patient with cardiac dysfunction under regional anesthesia. Our patient successfully underwent laparoscopic surgery under sole epidural anesthesia. The key to success was good preoperative assessment and optimisation, aggressive hemodynamic monitoring, lowered intra abdominal pressure and reduction in pneumoperitoneum time.*

I. Introduction

Laparoscopic surgeries have become one of the commonest surgeries in these days. But because of the significant hemodynamic changes associated with pneumoperitoneum it poses a significant challenge to the anesthesiologist. These hemodynamic changes can have adverse outcomes especially in patients with cardiac dysfunction.[1,2,3,4,5]Earlier regional anesthesia was not considered as a technique of choice in laparoscopic surgeries and more so in an IHD patient. Here we discuss a case wherein laparoscopic surgery was performed successfully under regional technique in a cardiac patient.

II. Case report

A 55 year old middle aged male patient was posted for emergency laparoscopic appendicectomy. On pre anesthetic evaluation the patient was found to be a known case of diabetes and hypertension since 10 years, asthmatic since 8 years, IHD and CVA since 6 yrs. He was on following medications tab metformin 500mg + glimipride 2mg BD, tab metoprolol 25mg OD, foracort inhaler puff on and off. Patient was on tab clopidogrel 75mg + aspirin150mg OD but had stopped since 2months due to non compliance. Patient also had an acute attack of bronchial asthma one month back. His effort tolerance was moderate. On examination, patient was weighing 72kgs and had central obesity. His vitals were within normal limits. Respiratory system examination revealed bilateral rhonchi. Other systemic examination revealed no major abnormalities. CBC was within normal limits, GRBS was 350mg/dl, ECG showed q waves in anterolateral leads. ECHO showed regional wall motion abnormalities with EF of 40%, mild TR and mild PAH present. Cardiologist opinion was taken and his instructions followed. 18G IV cannula was secured and 0.9% saline connected. Human actrapid infusion started to normalise blood glucose levels. Patient was nebulized with levosalbutamol and budesonide respules. Inspite of nebulisation rhonchi persisted and hence it was decided to go for a regional technique. Patient was accepted under ASA Grade III E physical status. An arterial line and CVP line was placed for hemodynamic monitoring. All emergency drugs were kept ready. In the OT, patient was connected to multiparameter monitor and basal readings were HR 80bpm, BP 146/88 mm Hg and SpO_2 92% on room air. Under strict asepsis, patient in sitting position, epidural space was identified at L2 – L3 interspace with 18G Touhy needle by LOR technique and 18 G epidural catheter was inserted. Test dose of 3ml plain lignocaine 2% was used after negative aspiration for blood and CSF. Epidural catheter was fixed and patient was made supine. 5cc of lignocaine 2% and 7cc of bupivacaine 0.5% was given through the epidural catheter in a titrated manner. Inj Midazolam 1mg, Injondansetron 4mg and Inj Fentanyl 100 mcg was given intravenously. Once the sensory level of T 10 was achieved surgery was commenced. An experienced surgeon was requested to perform the surgery with intra abdominal pressure maintained between 8 to 10 mmHg. CO_2 insufflation rate was kept at minimum so that its hemodynamic effects are better controlled. Fluids were titrated according to the CVP. Patient complained of right shoulder pain during surgery and he was comforted through re assurance. Surgeon requested for Trendelenburg and right tilt position. 15 to 20 degree of Trendelenburg and right tilt was given which the patient withstood well. Surgery lasted for 45 mins and patients hemodynamics were will within normal limits. CO_2 deflation was also done slowly and carefully. Patient did not require any further top up of local anesthetics through epidural catheter. Once the surgery was over patient was shifted to surgical ICU for monitoring.

III. Discussion

Laparoscopic surgery has become very popular since its introduction in 1987. Though cardiac diseases were considered an absolute contraindication for laparoscopy but because of the advantages that laparoscopy provides cardiac ailments have become a relative contraindication and sometimes even an indication nowadays. The various advantages of laparoscopic surgeries include minimally invasive, less postoperative pain, early

return to activities, less postoperative ileus, less wound infections and better cosmesis.[1,6] General anesthesia is the preferred anesthetic technique of choice for laparoscopic surgeries because of the various cardiorespiratory changes associated with pneumoperitoneum. But offlate regional technique is also being used for laparoscopic surgeries and its shown to be an effective alternative to general anesthesia.[7]

Pneumoperitoneum created during laparoscopic surgeries tend to decrease preload and increase afterload thereby leading to decrease in left ventricular stroke work, cardiac index and stroke volume. Deflation of pneumoperitoneum also leads to sudden increase in preload which can lead to congestive heart failure and pulmonary edema.[1.3.5]Zollinger A et al[3] studied various hemodynamic effects of pneumoperitoneum in cardiac patients and compared with normal individuals. In their study they concluded that pneumoperitoneum produces significant but relatively benign hemodynamic changes. They also concluded that with adequate hemodynamic monitoring laparoscopic surgeries can safely be performed in ASA class III patients with increased cardiac risk.

Carroll BJ et al[2] performed laparoscopic biliary operation in 13 patients who had severe cardiac dysfunction with EF <30%. They inferred that laparoscopic surgeries can safely be performed in severe cardiac dysfunction patients with adequate perioperative support and appropriate hemodynamic monitoring.

Perry JE et al[4] operated on a patient with end stage idiopathic cardiomyopathy who had global hypokinesia with EF <15%. They concluded that laparoscopic cholecystectomy can be safely performed in cardiac failure patients provided cardiac failure is medically stabilised, intra abdominal pressure, Trendelenburg and reverse Trendelenburg time and surgical time minimised and effective hemodynamic monitoring.

Studies conducted by Safranet al[5] also proved that laparoscopic surgeries can be safely performed in severe cardiac illness patients provided cardiac status is optimised, aggressive hemodynamic monitoring, administration of balanced anesthesia, reduced surgical time and low pressure pneumoperitoneum is maintained.

We avoided general anesthesia, as our patient had respiratory concerns like bilateral rhonchi and also keeping in mind the hemodynamic perturbations caused by intubation and extubation response especially in an IHD patient.[8] Hence by choosing a regional technique (epidural anesthesia) we avoided the side effects associated with general anesthesia like polypharmacy, stress response, injury to airway and post operative nausea and vomiting.Providing a sole epidural anesthesia had the advantage of stable hemodynamics unlike spinal anesthesia and general anesthesia where there can be sudden fluctuations. Epidural also provides good intra operative and post operative analgesia.[9]We had a CVP and arterial line for hemodynamic monitoring as there can be significant changes in Heart rate and blood pressure during creation, maintenance and deflation of pneumoperitoneum. Intra abdominal pressure was kept at 10 mm Hg which is considered low pressure pneumoperitoneum. Low pressure pneumoperitoneum reduces the pressure effects and also the pronounced reduction of cardiac index. Inflation and deflation of CO_2 was done in a controlled manner so that its effects on patientshemodynamics are miminised.[1,10, 11]In our case a stable hemodynamics was maintained throughout the surgical period. Experienced surgeons were requested to operate on our patient so that the operating time and pneumoperitoneum time was reduced significantly which was crucial to the successful outcome of the case. By reducing the pneumoperitoneum time, the effects of hypercarbia was reduced which otherwise could have had detrimental effects especially in a cardiac patient.

IV. Conclusion

We conclude that Laparoscopic surgeries can be safely done in high risk cardiac patients under regional anesthesia. Preoperative stabilisation of cardiac status, Aggressive hemodynamic monitoring, lower intraabdominal pressure and reduction in pneumoperitoneum timings are all crucial in patients who have cardiac dysfunction.

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