**Anesthetic Care**

**by Binu Kurian**

**Introduction**

The present study intends to critically analyse and justify the patient care provided throughout the anaesthetic period from the emergency unit to the post-operative care that led up to an event and trying to explain an evident growing gap between clinical experience and evidence-based practising. Trying to figure out why, in an evidence-based profession, care delivery varies among anaesthetists and theatres.

Nurses keep the confidentiality of the personal information of their patients. (The ICN code of ethics for nurses 2021). So, all identifying details of both organization and patient have also been changed here for confidentiality. As a result, the patient will be referred to as Mr. Alex, a 30 -year-old male who is reasonably fit and quite well and has a good exercise tolerance and his body mass index is 24.  Alex has no history of surgery and any other systemic or hereditary diseases. He has a habit of occasional consumption of alcohol and smoking.

**Case presentation**

Alex presented in the emergency department, with an acute right lower quadrant pain. He specified that the pain is not reducing even after taking the paracetamol. His pain was assessed by a pain numerical rating scale. It measures from 0 to 10. Zero denotes “no pain” and the intensity of the pain increases with ascending order of numbers. 1-3 represents mild, 4-6 denotes moderate pain. Severe pain scales from 7 to 10. (Robert S. Griffin et al. 2020). Alex’s pain was rated nine and he feels worsening of the pain with movement. There had been no nausea, vomiting, fever, or leucocytosis in the past. Positive peritoneal symptoms like abdominal guarding and rebound tenderness were found during the physical examination. A CT scan was carried out to confirm the suspected abscess.

A fluid-filled, enlarged appendix, emerges medially from the cecum positioned at the anterior portion of the right psoas muscle is visible in an axial CT scan of the upper pelvis. In the appendiceal neck, the cephalad aspect of a calcified appendicolith is visible. There are several dilated, fluid-filled ileal loops seen, which can cause diagnostic uncertainty until the appendix is connected to the cecum and a distal blind end is appeared (Urszula Kosciuczuk et al. 2021). The image also shows the calcified appendicolith blocking the neck of appendix. The findings confirm the diagnosis of acute appendicitis. He is suggested for an emergency laparotomy under general anesthesia.

**Peri operative phase**

 Around the time of surgery, the surgical team corresponded with the on-call anaesthetic registrar and also with the theatre coordinator, highlighting the urgency of the operation. Such cross-disciplinary collaboration resulted in efficient theatre space allocation, timely pre operative arrangements and proper anaesthesia care for Alex. The surgical and anaesthetic group gathered for the team briefing. This the first phase of the WHO surgical safety checklist (Yoon et al, 2017). Regardless of the urgent case, it is demonstrated that an effective team communication can improve the quality of patient care (Urszula Kosciuczuk et al. 2021). However, the clinical trials report that the group briefing can weaken this effect. (Pennington and Garside, 2019). Research shows that the execution of the safety check list of surgery resulted in the depletion of occurrence of complications and loss of life of patients go through surgery. (A B Bohmer et al, 2012).

It is a compulsory procedure to examine the anaesthetic machine and other equipments each time prior to the anaesthetic procedure (Urszula Kosciuczuk et al. 2021). In 2004, the measure to analyse the anaesthetic equipment was published by the association of anaesthetists of Great Britain and Ireland in their third edition. This checklist was accepted satisfactorily by the experts. It explained the different ways of inspecting and troubleshooting the anaesthetic instruments like pipelines, airway system, ventilation and monitoring equipment. It is mandatory to train the staffs to check the instrument and keep a book to be signed after verifying the instruments by each of them. (The association of anaesthetists of Great Britain and Ireland, 2004). Under the guidance of mentor, the anesthetist began to check the machine to make it prepared for the procedure.

A brief anesthetic plan is described explaining the induction of anesthesia and application of cricoid pressure. A 7.5 sized endotracheal tube, a red 18fr nasogastric tube, and opioids, fentanyl introduction and morphine titration are also planned throughout the surgery. The aspiration risk remains high in cases of obstruction of small intestine. Anaesthetists are instructed to adapt their treatment plan appropriately to prevent gastric aspiration (M Robinson and Davidson, 2013). Implementation of cricoid pressure is an effective part of the rapid sequence induction (RSI). RSI is a well-known procedure routinely used to smooth endotracheal intubation in patients with high chances of aspiration. It involves fast and continues administration of anaesthetic drug and relaxant followed by intubation (Seth J. Koenig, 2014, Wan et al, 2021).

Rocuronium is a muscle relaxant which appears to be widespread in clinical practise. Rocuronium is favoured because it has a faster onset than any other non-depolarizing neuromuscular medication and has little impact on the cardiovascular system (Urszula Kosciuczuk et al. 2021). Suxamethonium is also used to start short-term paralysis in general anesthesia. it was once thought to be the "gold standard" neuromuscular blocker for RSI (D T T Tran, 2017). The main adverse effect of suxamethonium is, it increases K+ level in plasma, that leads to dysrhythmias and fatal cardiac arrest in patients with abdominal sepsis. Another important contrary effect is its allergic reactions. It also causes quick oxygen desaturation in obese patients. Rocuronium, while pricier due to the requirement for reversal, has less side effects and allows for a faster onset of neuromuscular blockade. Sugammadex is a medication to reverse the neuromuscular block and that should be readily available in the event of an airway emergencies to revive the patient from unconsciousness (D T T Tran, 2017).

**Discussion**

Appendicitis is a very common ailment in England. Each year, 5000 people are hospitalized with appendicitis. ( <http://www.nhs.uk/conditions/appendicitis/>). Laparoscopy is a favoured approach to the surgery of peritonitis. It gives an accurate diagnosis as well as treatment. It is safe, effective with less trauma and fast recovery after surgery. These advantages make a laparoscopic successful alternative to conventional open surgical procedures. An open surgery involves a massive single incision in the abdomen. If the appendix has burst or access is problematic, it is frequently used. In the case of suspected appendicitis, a detailed abdominal examination is needed. This can diagnose the condition properly and can refer to the surgical team on time. The WBC count will be increased in most cases. US and CT scan are hardly used. The indication of acute appendicitis differs from person to person, making diagnosis difficult. Since the appendix serves no apparent use in the body, it is safer to remove it if any of the symptoms imply appendicitis instead of waiting for more evidence to confirm the diagnosis.

Mr. Alex reached the theatre after the examination from emergency nursing department. He presented to the emergency with an acute lower quadrant pain. His blood samples were already sent to the lab. His body temperature was elevated to 38 c and his pulse was 90/minute. His blood pressure was 124/80 mmhg. All other vitals were normal. The C reactive protein level was also elevated. His psoas sign was positive with a negative Rovsing’s sign. Alex has a catheter in place with fluid monitoring has begun and the first liter of plasmalyte is flowing to supply electrolytes. Do you have any questions? Both practitioner and anesthetist subsequently continued to the sign-in the checklist of WHO, which included verifying patient's information by checking it with him (M Robinson and Davidson, 2013). The medical care team must confirm the data obtained from the patient with theatre card and the care pathway. The practitioner communicated with the anesthetist that the patient was visibly uncomfortable and nervous. The patient used non-verbal communication. They both immediately sought to eliminate external stress, strain and calm the surroundings. They distract Alex with ideal conversation about his preferences, while also proceeding to achieve preliminary observations and start preparing for the anesthetic. The practitioner set down echocardiography monitoring, BP cuff, and saturation prob. The anesthetist flushed the canula with normal saline to check its patency. The cannula will be helpful during induction. But a bigger gauge will be inserted in case there were any complications during operation that required blood products and other quick fluid therapy (A B Bohmer et al, 2012). A 16-gauge grey had already been provided. Quick infusions require a bigger gauge cannula, with an 18-gauge enabling a 30 percent rise in both gravitation and pressure.

The whole health care team of Mr Alex communicated each other through verbally and nonverbally to share the details including grading of view (Krage et al, 2010), cuff up, misting and capnography trace. They also communicated about Mr Alex chest movement and it was satisfactory.

The induction of anesthesia was started with communication skills including both verbal and non-verbal to details the information specially grading of view, cuff up, in connection with misting, co2 trace and observed bilateral chest movement. The endotracheal tube was (7.5) securely inserted following critridoid pressure off. Pre oxygenation and administration of propofol were given (2 mg/kg induction bolus dose) then switched to desflurane for the maintenance of general anesthesia. Propofol is a typical induction agent since it is quick acting and safe for emergency intubation of endotracheal tube (Seth J. Koenig, 2014., Wan et al, 2021). Ketamine or etomidate are other induction agents. Comparatively Propofol showed better results in severely ill patients who require intubation. Clinical trials tried to find out the best maintenance agent among desflurane and sevoflurane. Desflurane is volatile with minimal blood: gas partition co efficient. It helps for rapid onset of anesthesia and also quick recovery. But its pungent smell hurt the upper airway and may result in respiratory difficulties (Mukul Chandra Kapoor, 2012) The blood: gas partition co efficient of sevoflurane is 0.65. this ratio is greater than that of desflurane. It causes minimal airway irritation. In a study of high-risk patients (Yoon et al, 2017), post-operative nausea and vomiting were reduced when Sevoflurane was used as maintenance. This is a crucial thing that has to be considered in major abdominal operations. The post operative vomiting should be prevented to minimize the most of the post operative complications. An intravenous dosage of 8 mg of Dexamethasone should be administered at induction (Dreams Trial Collaborators, 2017). This was given to Alex along with 4 mg of Ondansetron. This will minimize the chance of vomiting and nausea after the surgery.

Anesthetist also set up the ventilator setting to pressure control. Before that the patient’s Mallampatti score was assessed as class III airway. Only the base of the uvula was visualized with a marginal mouth opening (Yozo et al, 2014). The Nasogastric tube is also inserted through the right naris to remove the excess gastric fluids and gases from the stomach. According to Moss and Hodin, the nasogastric tube helps to reduce the risk of aspiration while given anesthesia (Moss and Hodin, 2017). There is a chance of a lot of complications in nasogastric tube insertion, including pneumothorax, epistaxis and puncture of oesophagus (Ana Paula Gobbo Motta, 2021). Glidescope intubation has more successful rate when compared to MacIntosh laryngoscope (Wan Hafsah Wan Ibadullah, 2016).

Once the tube was in place, the eyes were tied shut using transpore tape and monitoring was checked for any signs of an unfavourable reaction. The anesthetists noticed some gastric secretions pouring out of the patient’s mouth. Anesthetist has informed the practitioner but within seconds, a large volume of yellow fluid was expelled. The Anesthetis has immediately started suctioning from the oropharynx and placed the patient’s head down slightly into left lateral position. The oxygen flow rate also adjusted to ten litres per minute. Checked for further regurgitation and confirmed no regurgitation. The depth of the tube was noted and capped carefully to shift the patient from anaesthetic room to theatre. The chances of pulmonary aspiration ranges from 1 in 900 to 1 in 10000 cases. Gastric fluid aspiration can cause the pneumonitis and increase the risk of mortality. Reducing gastric volume and pH, airway protection and extubation are the other strategies to reduce the risk of aspiration (Robinson and Davidson, 2013).

The anesthetist set the ventilator settings to pressure control after connecting to the anesthetic machine in the theatre. In Mr. Alex’s case the anesthetist opted pressure-controlled ventilation settings because of steep increase in airway pressure. Pressure controlled ventilation regulates the flow rate during inspiration and maintain air pressure at moderate level. It has minimal risk of barotrauma because it provides higher lung compliance and limited airway pressure. The anesthetist also sets the positive end expiratory pressure (PEEP), peak inspiratory pressure (PIP), inspired oxygen fraction (F1O2) and respiratory rate (RR). PEEP can lessen the changes in venous return and cardiac output. It also helps to improve arterial oxygenation. Tube cuff also suggested to Mr. Alex for further inflation, because his bilateral chest movement was not satisfactory. After inserting 3mls of extra air, the anesthetist again checked his chest with a stethoscope and confirmed the air entry to all the sides.

Following the patient through anesthesia, the anesthetist, got a clear picture about the drugs, dosage and their different pharmacological actions. The anesthetist also expertise to intubate the patient and has got idea on the different measures of the endotracheal tubes. The exposure to such experience helped the anesthetist to check the machine and equipment as per the AAGBI guidelines (Urszula Kosciuczuk et al. 2021).

The ability of the patient and the clinician to identify common ground will be aided by effective communication. The best tool for the proper health care team is structured communication. The decision made by the healthcare team is based on individual need. It is part of patient centered care. Both patient and professionals are partners. The care team support their patients clinically, mentally and emotionally. When speaking with the patient, both the anesthetist and the practitioner gradually showed empathy. The face language and the tone are very important in dealing with patients. The importance of nonverbal communication cannot be underrated. The conflicts between the practitioner and the anesthetist should be solved without much egos, otherwise this stigma may delay the decision making. The anesthetists and the practitioner integrated and managed the situation. No single consultant can handle and manage this kind of emergency situation. Each person trusts, depends on others. Effective team work instantly and positively helps the patient's safety. All the core members effectively communicated during the whole procedure.

**Post operative care**

All the pre- resuscitation markers were assessed to calculate the APACHE score (Robert S. Griffin et al. 2020). The need for a ventilator and other cardio respiratory support was checked. Periodic reassessment was done regarding the antibiotic regimens and made proper dose variations. Advised to avoid strenuous activities. Morphine 0.1mcg/kg was given to relieve the pain. Metoclopramide 500 mg was given to prevent nausea and vomiting. A plain food diet is advised on the day of surgery. Constipation is common when taking opioids. Colace suggested to treat this. Scheduled a post operative appointment for follow up.

**Conclusion**

Acute appendicitis is a serious health issue which has to be managed on time to reduce the risk factors. Some cases need urgent medical attention so as to prevent further complications of sepsis. The usual method of surgery is laparoscopy as it has advanced remarkably.it reduces the risk and complications and also the prolonged stay in the hospital like in open surgery. In the present case, the patient was undergone a successful mode of anesthesia and surgery. The choice to undergo anesthesia might also be influenced by the patient’s preferences. The emergency department had done a detailed check-up of the patient and shifted him for anesthetic procedures. Consistent monitoring of his vital signs throughout the surgery was done to avoid complications. Utmost care has been taken to avoid fluctuations in all vitals. The complication aroused during the procedure was aspiration that could managed successfully. Anesthetic skills and effective communication improved the success rate of the whole procedure. Both the Anesthetic and the practioners maintained the communication skills throughout the procedure which reduced the chances of risks and improved the patient care. Post-operative care is also given properly to manage all the post-operative side effects. Anticipated side effects were vomiting and pain. A patient centred care delivery was performed with an empathetic approach towards the patient.

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