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Case Report

Anaesthetic Management of Old Patient with Duodenal Perforation with Co-Morbidities - Thoracic Epidural

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ABSTRACT

Duodenal perforation is a common emergency in hospital setup and has to be attended efficiently. It's a challenge to an anaesthetist. Delayed presentations, old age, hemodynamic instability, presence of sepsis and organ dysfunction are some of the predictors of poor outcome in such patients. Pre-operative evaluation and stabilising vitals is a key along with surgical intervention (laparotomy). Time of presentation to hospital for definitive management is an important factor for the morbidity associated with these patients.

Keywords:- Pre-operative evaluation, duodenal perforation, asthma, thoracic epidural.

INTRODUCTION

Gastro-intestinal perforation is a surgical emergency. [1] The prevalence is more in males (males 83.1 % and female 16.9 %). A study also showed more male patients of perforation peritonitis, with male-to-female ratio of 3:1. [2] Perforation of the proximal part of the gastrointestinal tract was more common, [3] which are in contrast to the studies from western countries where perforations are common in the distal part. [3]

CASE REPORT

65 year female weighing 70 kg (obese) known case of bronchial asthma on & off medications, known case of hypertension not on regular medication, transient ischaemic attack 2 years back on no medications &documentation was absent came with complaint of pain in abdomen and abdominal distension. On admission patient was conscious and oriented pulse-108/min, blood pressure-150/100 mm Hg. On examination bilateral wheeze present, cardiovascular status was normal. Her central nervous system examination was normal. Her Hb-11, CBC-15000, Platelet-235000, BUN-30, Serum creatinine-1.8, Serum sodium-150 mEq, Serum potassium-5.1. Liver function test were within normal limit.

After admission two intravenous line were secured using angiocath no.20 and intravenous fluid were started with ringer lactate from one angiocath at the rate of 100ml/hr. Patient was catheterised and urine output of 100 ml was noted. Pre-operative IV Inj. Hydrocort 100mg and Inj. Deriphylline R 150 mg half an hour before surgery. Oxygenation by face mask was done.

Pre-operative assessment:

History: Abdominal pain is the main symptom. Duration of pain is also important as long standing pain also

necessitates the need to rule out septicaemia and multi-organ dysfunction. Pain may be accompanied by nausea and vomiting. [4]

Examination: Examination should mainly focus on intravascular volume & shock mainly judged by pulse volume, watch for multi-organ dysfunction. Clinical features like blood pressure, fever, tachycardia, tachypnea, leucocytosis. Abdominal respiratory movements will be diminished, guarding& rigidity may be present due to peritoneal irritation.

Hypovolemic shock: Clinical features of hypovolemic shock such as hypotension, tachycardia and oliguria are often present in the first few days of acute generalized peritonitis. If the circulatory state is uncorrected and if prompt surgery for the peritonitis is delayed, the patient can deteriorate rapidly, which can prove fatal. [5]

Investigations: Investigations which are recommended in patients are complete blood count including platelet count, serum electrolytes, liver and kidney function tests, blood sugar and electrocardiogram. Systemic features of sepsis should warrant investigation like coagulation profile and blood gas analysis. Imaging studies like X-ray Chest or abdomen in the upright position will reveal gas under the diaphragm. Paralytic ileus is characterized by marked distension of small gut. If the patient is too sick for an X-ray in the erect posture, then a left lateral decubitus X-ray of the abdomen is of help. It may show the presence of free air between the liver margin and the abdominal wall. Presence of free fluid and gas in the peritoneal cavity after perforation of gut is visible as a fluid collection with a clear horizontal air fluid level. [6]

Management: Management consists of the following important features:

1. Quick restoration of the circulatory hemodynamics followed promptly by surgery
2. Use of appropriate antibiotics
3. Critical Care and support of different organ systems
4. Maintenance of nutrition.

Hemodynamic Resuscitation: The objective of pre-operative resuscitation is to rapidly restore adequate oxygen delivery to peripheral tissues. Most patients are hypovolemic from the massive sequestration of fluid into the peritoneum and into the lumen of gut. In high surgical or trauma patients with sepsis, early hemodynamic optimization before development of organ failure reduced mortality by 23% in comparison with those who were optimized after development of organ failure. [6]

Antibiotic Therapy: Empirical Therapy should be started promptly effective against gram negative enteric aerobic and anaerobic microorganisms.

Intra-operative management: The primary goal of anaesthesiologist during the intraoperative period is to provide safe and optimal care. General anaesthesia with endotracheal intubation and controlled ventilation is the technique of choice barring few co-morbid conditions. Almost all the laparotomies are done on an emergency basis. A quick and thorough airway assessment must be done to identify any potential difficulty. One should make sure that appropriate help is available in the operation theatre. In addition to the standard intraoperative monitoring, invasive hemodynamic monitoring should be considered in hemodynamically unstable patients. Special care should be taken to maintain normothermia and fluid, electrolytes and acid base balance. Advanced age, comorbid illnesses, delayed presentation, presence of features of sepsis or organ dysfunction are some of the predictors that the patient will require ICU care after surgery. [7-14]

Post-operative management: Post-operatively patient was shifted in ICU for monitoring for next 72 hours. Nebulisation

was given with budecort & duolin as per physician opinion. And post-operative analgesia with Inj. Ropivacaine 0.2% and Inj. Tramadol 60 mg diluted till 10 ml given as per need epidurally. Patient recovered without any pulmonary complications.

DISCUSSION

Induction of Anaesthesia- After connecting pulse oximeter SaO2-96-98%, NIBP cuff with 160/100 mm Hg and noting urine output of 100ml.Intravenous fluid in the form of ringer Lactate started and around 400 ml of it is allowed to go. Patient made to seat in upright position under all aseptic precautions T8-T9 space identified and using 16G epidural set epidural catheter inserted inj. Lignocaine with adrenaline as test dose to confirm position of catheter then Inj. Lignocaine 7cc + Inj. Ropivacaine 0.2% 3cc given. Adequate action up to T4 noted (by loss of pinprick).

Disadvantages of General Anaesthesia- The occurrence of clinically significant" severe" bronchospasm has been reported in 0.2%to 4.2% of all procedure involving general anaesthesia performed in asthmatic patients. Factors that are more significant in predicting the occurrence of severe bronchospasm include the type of surgery (risk is higher with upper abdominal surgery and oncologic surgery) and proximity of most recent asthmatic attack to the date of surgery.

Several pathophysiologic mechanisms could explain the contribution of general anaesthesia to increased airway resistance. Among these are depression of cough reflex, impairment of mucocilliary function, reduction of palatopharyngeal muscle tone, depression of diaphragmatic function, and an increase in amount of fluid on airway wall.

Direct mechanical airway stimulation by endotracheal intubation, parasympathetic nervous system and/or release of neurotransmitters of pain such as substance P and neurokinins may play role.

When general anaesthesia is accomplished with an intravenous induction drug. The incidence of wheezing is higher in asthamatic patients receiving thiopental for induction than in those given propofol. Thiopental itself does not cause bronchospasm, but it may inadequately suppress upper airway reflexes so airway instrumentation may trigger bronchospasm. Ketamine though cause bronchodilation and contribute to decrease airway resistance, patients already wheezing but it increases airway secretions. After patient is rendered unconscious lungs are often to be ventilated with a mixture containing volatile anaesthetic. The goal is to establish depth of anaesthesia that depresses hyperactive airway reflexes sufficiently to permit tracheal intubation without precipitating bronchospasm. After endotracheal intubation, it may be difficult to differentiate light anaesthesia from bronchospasm as the cause of decrease in pulmonary compliance.

Administration of neuromuscular blocking drugs relieves the difficulty of ventilation resulting from light anaesthesia but has no effect on bronchospasm. [15]

So as neuraxial blockade avoids instrumentation of the airway and tracheal intubation, regional anaesthesia is an attractive option when operative site is suitable for this.

Role of Neuraxial Blockade- As general anaesthesia may cause increased intrapulmonary shunting and atelectasis, postoperative pulmonary complications are common in patients with asthma and obese patients. Patients under regional anaesthesia usually develop fewer pulmonary complications than those under general anaesthesia (Pedersen et al. 1992); this is why we chose epidural anaesthesia for this procedure.

There are several advantages to using regional anaesthesia for surgery in

this case. First, preoperative pulmonary function parameters may be maintained throughout the surgery (Kim et al. 2007; van Zundert et al. 2006; Pursnani et al. 1998).Using epidural anaesthesia for our patient helped avoid airway intervention and attenuated sympathetic responses caused by the surgical insult; this likely improved his postoperative outcomes and accelerated baseline function return. A sensory level of T6 was found to be adequate for exploratory laparotomy though in this case inj. midazolam 1mg sufficed for sedation. Recent evidence suggests thoracic epidural blockade to be beneficial during sepsis by improving gut perfusion. [16] Spackman et al. have also shown that epidural analgesia resulted in improvement in gastric mucosal perfusion and the ultrasound appearance of the small bowel. [17]

Even as epidural blockade is associated with segmental blockade &decrease in arterial blood pressure is believed to be more gradual and of less magnitude with epidural blockade than with spinal anaesthesia thus decreasing chances of sudden hypotension. [18] Obesity is generally concluded to be a risk factor for the development of perioperative deep venous thrombosis and pulmonary embolism (Wu and Barba 2000). The risk of deep venous thrombosis and pulmonary embolism is lower with epidural anaesthesia than with general anaesthesia (Rodgers et al. 2000). Finally, Because of the absence of side effects, such as vertigo from general anaesthesia and intravenous opioids, patients receiving epidural anaesthesia and analgesia post-operatively tend to ambulate earlier than patients receiving general anaesthesia. Early ambulation may decrease the incidence of postoperative pulmonary complication in obese patients (Rawal et al. 1984).

CONCLUSION

Thus epidural anaesthesia may be a viable alternative to general anaesthesia for laparotomy or even upper gastrointestinal surgery in selected cases. This anaesthetic technique may maintain pre-operative respiratory function, increase alertness, and reduce the use of rescue analgesics. A speedy return to baseline function is crucial for optimal outcomes in these patients.

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