

## **ANAESTHETIC MANAGEMENT OF SURGICAL EMERGENCIES**

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### **ABSTRACT**

Anaesthesia for surgical procedures carries some risks. These risks are accentuated when the surgical operation is performed as an emergency procedure. The value of emergency in risk stratification underscores its relevance in clinical anaesthesia. Limited time for evaluation of patient, potential fluid/electrolyte imbalance, the 'full stomach' situation and probable uncontrolled pain constitute major considerations in the administration of anaesthesia for emergency surgery. This expose seeks to discuss some of the clinical scenarios that are apt to emergency anaesthesia and in particular, the associated common clinical dilemmas.

### **INTRODUCTION**

The care of the surgical patient does occur sometimes without sufficient notice. These scenarios run through all surgical subspecialties. The emergency nature of the surgical intervention carries with it certain risks. The anaesthetic care of such patients with little or no previous knowledge about the pathology or procedure could be a challenge. While the surgical procedure may be same for two different patients, the anaesthetic care could be modified by the extent of

the pathology and/or concurrent medical problems. Hence, the special concerns with anaesthesia for surgical emergencies.

### **SCOPE OF THE PROBLEM**

The safety profile of elective surgical procedures has improved over the years. Same cannot be said of surgical emergencies. Evidence abounds in the literature implicating emergency surgical or anaesthetic management with poor outcome.<sup>1-3</sup> In addition, the classifications in anaesthetic care recognizes the place of emergency care in risk stratification. Specifically, procedure performed on emergency basis has 4 out of 25 points in the Goldman Risk Index for non-cardiac procedures in cardiac patients. Similarly, the widely used American Society of Anaesthesiologists classification of physical status recognizes the peculiarities of emergency procedures. It is common knowledge that all anaesthesia care carries some risks. It appears that emergency procedures accentuates these risks and hence, the visceral responses by anaesthetists to anaesthetic management of surgical emergencies.

Specifically, a Canadian study evaluated deaths within 7 days after anaesthesia<sup>2</sup> The study showed 71 out

of 10,000 deaths and the urgency of surgery was a factor in anaesthetic mortality. Similarly, Keenan and Boyan<sup>2</sup> showed that cardiac arrest was six times more likely during emergency anaesthesia than during elective procedures. Our experience in Benin City is similar. In a review of the anaesthetic morbidity over a 10- year period revealed that emergency

procedures have an 8-fold risk of anaesthesia related complication.<sup>4</sup> Thirty patients had complications related to anaesthesia; 29 had emergency anaesthesia and 1 had elective caesarean section (**Table I**). Minimizing the accentuation of risks associated with anaesthesia for surgical emergencies is the object of this exposé.

**Table I: ANAESTHESIA RELATED COMPLICATIONS AFTER CAESAREAN SECTION**

Type of C-section	No of complications	No of anaesthetics
Emergency	29	2102
Elective	1	584

**Table II: PLACENTA PRAEVIA AND RISK OF PLACENTA ACCRETA**

Feature	Risk of P. accrete
Placenta praevia + an unscarred uterus	5%
Placental praevia +one previous C/S	24%
Placental praevia + two previous C/S	47%
Placental praevia + Four previous C/S	67%

### SPECIFIC CONSIDERATIONS

There are specific and common problems associated with the administration of anaesthesia for emergency procedures. The high perioperative risk associated with emergency procedure may be reduced by careful consideration of the problems of providing perioperative care to those in need of immediate surgical treatment. The peculiar problems include, but not exclusive to, full stomach, hypovolaemia, pain, concurrent medical diseases and limited time for patients' preparation.

1. **Full stomach:** The residual gastric volume depends on the stomach emptying. Gastric emptying depends on factors such as volume and content of the last meal. It is a general consensus that the stomach is considered empty 6 hours after a solid meal. However, gastric motility is delayed by trauma,

pain, fear and administration of opioids. The time of ingestion of food to the time of trauma is thus a more realistic factor in the assessment of the residual gastric volume after trauma. The implication of a full stomach on general anaesthesia is well delineated. A full stomach predisposes to regurgitation and probable aspiration of gastric contents. This risk is enormous and outcome is quite poor especially in developing countries. This is a classic example of the cliché; prevention is better than cure.

2. **Limited time for patient's preparation:** This is the very crux of the anaesthesia for emergency procedures. There is little or no room for postponement of surgery. Therefore the surgical procedure becomes an

imperative. Time for patient assessment is limited as well as time for further evaluation of any finding on physical examination. In elective procedures, such observations are usually evaluated in full and postponement of surgery may be necessary to improve outcome. This is not the case in emergency anaesthesia. Hence the risk associated with anaesthesia for emergency procedures is higher than elective procedures.

3. **Hypovolaemia:** This is not uncommon in emergency surgical care. Hypovolaemia may result from haemorrhage or fluid loss from diarrhea or vomiting. Frequently too, the fluid loss is associated with electrolyte disturbances with certain but grave consequences on the outcome of anaesthesia and surgery if not corrected.
4. **Co-existing medical diseases:** Several medical diseases like uncontrolled hypertension, diabetes mellitus, asthma, congestive cardiac failure or other cardiac problems could complicate the course of surgery and anaesthesia. Standard care requires that the intercurrent medical disease be optimized prior to induction of anaesthesia. This is often not possible in emergent situations. It is necessary that attempts should be made at optimizing the medical condition as much as time would allow.
5. **Pain:** A number of conditions requiring surgical intervention are painful. The pain should be addressed and the pharmacologic implications of analgesics used for treatment noted.

## **ANAESTHETIC MANAGEMENT:**

**Preoperative assessment:** It is important that all patients for surgery and anaesthesia are assessed by the anaesthetist. Time may be a constraint. However, history of last meal/fluid, drug allergy, difficulty with previous anaesthetic and intercurrent medical diseases/current medications should be elicited. The physical examination should determine risk of regurgitation/aspiration as well as ease of tracheal intubation. Laboratory investigation should be those that will contribute to the management of the patient. Results should be noted and necessary action taken.

Resuscitation of the patient prior to induction of anaesthesia is important. Correction of fluid and electrolyte imbalance must be undertaken. It may be necessary to administer some drugs for treatment of hypertension, diabetes, or raised intraocular pressures prior to anaesthesia. Antacid prophylaxis to reduce risk of regurgitation/aspiration should be considered. Intravenous ranitidine, metochlopramide are readily available for use in this subregion. 0.3M sodium citrate has specific advantages over mist magnesium trisilicate especially in obstetric surgery.

### **Choice of anaesthetic technique:**

The anaesthetic choice for emergency procedures is guided by the nature of surgical technique and the preferences of the anaesthetist. General anaesthesia as well as regional anaesthesia can be used for emergency surgery. However, due to the urgency of emergency procedures, general anaesthesia is more often employed than regional anaesthesia. The apparent simplicity of the induction of general anaesthesia as compared to time required for regional anaesthesia may be a factor in the

popularity of general anaesthesia for emergency procedures.

Preparation for the anaesthetic technique of choice should include drawing up of drugs. Besides the required drugs, vasopressors, atropine, adrenaline and other emergency drugs should be prepared irrespective of the chosen technique of anaesthesia. Intravenous access should be ensured using large bore cannula. Indeed, bleeding cases should have another line for rapid infusion of fluid or blood. Rapid sequence induction of general anaesthesia is mandatory. Cricoid pressure should be applied prior to onset of loss of consciousness. Induction agents that minimally affect the haemodynamic status of the patient are most suited for the induction of anaesthesia. The relative safety of ketamine may be lost in patients with inadequate resuscitation. Suxamethonium remains the most effective neuromuscular blocking agent for rapid control of the airway in an emergency situation. It is pertinent to avoid regurgitation/aspiration at induction of anaesthesia. Similarly, measures at ameliorating aspiration risk should be instituted at tracheal extubation. There are no specific guidelines on the point of recovery after anaesthesia for emergency procedures. Rather the state of the patient should determine if further care would be necessary in the general ward, high dependency unit (HDU) or intensive care unit (ICU).

### **SOME DILEMMAS IN EMERGENCY ANAESTHESIA**

This section shall review 3 common anaesthetists' dilemmas in emergency anaesthesia. It is by no means exhaustive as there is no single mode of presentation known to these patients.

### **Anaesthesia for intestinal obstruction:**

This is one of the common surgical emergencies that an anaesthetist may have to provide care. There is often conflict between the surgeon's desire to operate and the anaesthetist's concerns with fluid and electrolyte balance. Institutional problems may lead to delay in electrolyte correction. Correction of the fluid and electrolyte is of vital importance. Fluid therapy is best conducted with balanced salt solutions like Lactated Ringers, 0.9% saline amongst others. The haemodynamic variables should be within normal limits prior to induction of general anaesthesia. There is no wide choice of anaesthetic technique available. This makes general anaesthesia the only option for the anaesthetic management of the patient with its attendant problems.

### **Penetrating eye injury and anaesthesia:**

Penetrating eye injury is often traumatic. And it is not uncommon for the patient to have just had a meal. The anaesthetic care of the patient with a penetrating eye injury and yet has a full stomach could be an anaesthetist's nightmare. Suxamethonium is the main neuromuscular blocker for rapid control of the airway in rapid sequence induction of general anaesthesia. It is however associated with an increase in intraocular pressure, which could lead to vitreous loss and consequent blindness. This is inimical to the very objective of surgical care; to restore good sight and good health. However, delay of time of surgery may facilitate gastric emptying and minimize risk of regurgitation/aspiration of gastric contents. Although rocuronium have been suggested as substitute for suxamethonium at high doses (ED<sub>95</sub>),<sup>5</sup> the rapid recovery of neuromuscular function after suxamethonium remains an advantage.

**Antepartum haemorrhage and anaesthesia:** This is one of the commonest obstetric emergencies that challenge the obstetrician, anaesthetist and the hospital's capacity for emergency services. The anaesthetic concerns include airway evaluation in case general anaesthesia is required, adequate intravenous access, ready availability of cross-matched blood. There is invariably significant blood loss associated with placenta praevia. There is sufficient evidence that regional anaesthesia for caesarean section is associated with reduced blood loss and decreased blood transfusion.<sup>6, 7</sup> However, the use of regional anaesthesia in a bleeding patient and risk of morbidly adherent placenta is contentious. The risk of placenta accreta is related to the number of previous uterine scars in the presence of a placenta praevia<sup>8,9</sup>. This risk increases with rising number of previous uterine scars (**Table II**). The presence of placenta accreta indicates extensive surgery and increased risk of blood transfusion. Thus the occurrence of placenta praevia and previous caesarean delivery could mean avoidance of regional anaesthesia. Nevertheless, it may be instructive to have two intravenous accesses and the donor blood available in the operating room especially when dealing with the bleeding placenta praevia or one with previous uterine scar.

#### THE WAY FORWARD

- Improved communication/team effort: There should be good communication skills between the surgeons and anaesthetists. The anaesthetists should be informed early in the management of the patient rather than when the surgeon is ready to operate. The early participation by the anaesthetist would avoid delay in commencement of surgery and improve outcome. The complementary role of the anaesthetist would achieve greater results if anaesthetic inputs are made during optimization of the patient's condition.
- Assistance for the anaesthetists: Most surgical emergencies are performed at odd times or at night. These are periods when available manpower could be low. It is important that the anaesthetist is informed of the patient and the clinical state early enough. Such prompting may allow for recruitment of assistance from senior colleagues.
- Personnel training: There is no substitute for personnel development. Training workshops and courses will continuously update the practitioner's knowledge and skills.
- Equipment: There is need for modern equipment in the anaesthetic management of the surgical patients. These equipment are not cheap and health budgeting in the subregion is not favourable. However, clinical monitoring should involve pulse oximetry, capnography, electrocardiography and others in the Harvard minimal standards. The use of surrogate makers in clinical monitoring should be discarded. For instance, an unrecognized oesophageal intubation may be indicated by changes in capnography and pulse oximetry. Attempts at using the colour of blood at surgical incision as an indicator of level

of oxygenation is of dubious clinical value and fraught with risks.

## CONCLUSION

There is no silver bullet in the anaesthetic management of the patient for emergency surgery. The anaesthetic care of such patient must be individualized. It is necessary that the surgical risks as well as the peculiarities of emergency anaesthesia are recognized. Resuscitation and optimization of any intercurrent medical problem should be undertaken prior to anaesthesia and surgery. The anaesthetic plans must be developed to address identified problems. Good planning and clinical prudence in the perioperative period could result in favourable outcome.

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