

Anaesthetic management for puerperal sterilization/lap.sterilisation in a PHC set up.

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Introduction:

As the Indian population swelled from 30 crores in the Bharathiar era to 120 crores as of now and continues to grow, the application of brakes for the same becomes an essential practice to know as a medical graduate. It is well known that it is difficult to motivate men for sterilization in a traditional country like ours. The two popular permanent methods of contraception are a tubal ligation in the postpartum period or a Laparoscopic ring application in the interval period. A distinct lack of personnel and equipment in major hospitals led to a development of such mass surgeries in an inferior set up such as a primary health centre (PHC). An inferior facility either in surgical or anaesthesia field is never supposed to compromise on safety of patients. Hence a very rational combination of mass surgeries with reasonable safety is contemplated. We will discuss this topic with aims, techniques, their pros and cons and a summation. We will try to delineate the lap. surgery and non-lap cases on and off.

Aims:

The possible aims of any technique must be to ensure patient safety with easy and early dischargibility.

Techniques:

Preoperative assessment:

A routine preoperative assessment is not done. The PHC usually has no qualified anaesthesiologist. It has to depend on a visiting consultant and usually the assessment is done on the spot. The medical officer or a qualified staff nurse chooses the cases. They present to him on the day of surgery possibly an hour before the surgery. The patients are brought by health workers who have their targets for such cases. Hence the attending anaesthesiologist faces with a

dilemma of making cases unfit or throw a partially prepared patient into the fray with some possible risks. Example: a case of recovering respiratory illness. Considering the investigations, usually hemoglobin of 9 gm% and a normal urine routine remain the lakshman rekha to clear the fitness hurdle. In the festive atmosphere of mass cases, the patients themselves opt not to inform any systemic illness they have. E.g. Seizure disorder. Hence we have to be extremely cautious to avoid cases with any systemic illness as they are better done in nearby institutions.

With regard to equipment, drugs and staff an anaesthesia machine with two cylinders of oxygen and a nitrous oxide cylinder may be available in most instances but the other airway equipment like laryngoscopes are carried by the attending anaesthesiologist. There are PHCs with all types of laryngoscopes; laryngeal masks and appropriate sized endotracheal tubes. These equipment with suction are usually checked on the day of the camps and all the other days they are dispersed in each corner. Hence checking all equipment with more concentration is an essential part of anaesthetic administration in this set up. Usually fasting guidelines are strictly followed in non-lap cases where the cases are admitted earlier. But in lap cases, due to an unwanted haste from the attendants and workers, full stomach patients may present to us. Regarding premedication, there is no idea about among working people in a PHC which includes medical officers. Still there are some anaesthesiologists who prefer to instruct on their visit, all patients should have H2 blockers and metoclopramide by any preferable route. There are studies which approve the use of intravenous midazolam as premedication with no obvious prolonged discharge times.

Anaesthetic technique:

Many obstetricians prefer to perform postpartum tubal ligation immediately after the delivery or before the discharge with a few distinct advantages:

1. Immediately after delivery, the uterine fundus is abdominal so the fallopian tubes remain easily accessible.
2. Uncomplicated postpartum sterilization does not increase the hospital stay.
3. There is less medical expense.

There are some hiccoughs. The physiological changes of pregnancy do not revert back to the normal stage for at least 6 weeks. One should not anesthetize any women with a full stomach with the possibility of a full stomach and increased gastric acidity for elective surgery like tubal ligation. It is clear from many studies that we cannot be sure about the gastric volume and pH up to 48 hours postpartum and that at least 33% of women will be at risk.

The anaesthetic options are

- a) An epidural anaesthesia instituted prior can continue but this is unheard in PHC set up. There is controversy regarding the duration of increased sensitivity to local anaesthetics after delivery. In an elegant study, Brooks and colleagues observed an increased spread of sensory anesthesia up to 36 hours postpartum, and following this period, the dose requirements were not significantly different from those of nonpregnant population. The preferable dose is 12 to 14 ml of 1.5 to 2 % lignocaine with adrenaline. If facilities permit, fentanyl 25 mic. gm. may be added. A level of T5- T6 is necessary to perform a tubal ligation. But as said earlier, this technique is nonexistent in a PHC set up.
- b) An intrathecal anaesthetic administration of hyperbaric bupivacaine (1.8 to 2.2 ml) after a prior intravenous access and adequate preloading is another option. The advantages of a spinal anaesthetic are a good relaxation, no time bound urgency and excellent perioperative analgesia with minimal use of polypharmacy. Yet monitoring is essential when we administer intrathecal anaesthesia. A routine monitoring with excess caution during the postoperative period is a must. A steep head down with pneumo peritoneum in laparoscopic cases makes this technique less conducive.
- c) In general anesthesia which is commonly given, spontaneous, IVA, Controlled general anaesthesia either with laryngeal masks or endotracheal tubes are different methods.
 1. Intravenous access.
 2. Metoclopramide, 10 mg intravenously, plus non-particulate antacid
 3. Rapid-sequence induction: preoxygenation, cricoid pressure, and a cuffed endotracheal tube 7 to 7.5 mm in size
 4. Sodium thiopental, 4 mg/kg, or ketamine, 1 to 1.5 mg/kg, plus succinylcholine, 1 to 1.5 mg/kg

5. Routine monitoring (blood pressure, electrocardiogram, pulse oximeter, capnometer, temperature)
6. Ventilation with O₂ and N₂O and a low concentration of inhalation anesthetics (to prevent uterine relaxation and bleeding especially the safe time for the nonexistence of postpartum haemorrhage has not elapsed) like enflurane, isoflurane, and sevoflurane.
7. Continuous infusion of 0.1% succinylcholine or nondepolarizing muscle relaxants like atracurium to ease ventilation
8. Narcotics like fentanyl, pentazocine, pethidine
9. Deflation of the stomach by a nasogastric tube inserted via the mouth
10. Extubation after the woman is awake.

The above ten steps are essential but unfortunately very difficult to follow. The administration of controlled general anaesthesia is safe with good relaxation especially in laparoscopic cases.

In a study of 99 cases of laparoscopic sterilization which were randomly allocated to receive either total intravenous anaesthesia with propofol or isoflurane inhalational anaesthesia. The results showed no significant differences between the two groups in respect to functional recovery, nausea, vomiting or pain over the 7 day study period. There was one more study which compared TIVA with propofol-remifentanyl and fentanyl-propofol-atracurium techniques. They concluded that both anaesthetic methods provide equally good postoperative pain relief, few unplanned admissions and a high degree of patient satisfaction when combined with postoperative paracetamol and NSAID. Patients anaesthetized with remifentanyl and propofol had less postoperative nausea. When we use muscle relaxants, we are bothered about recurarization and postoperative vigilance. As the immediate postoperative care is usually left to paramedical personnel in this set up, it's wise to avoid neuromuscular blockers.

In a prospective, randomized study comprised 125 outpatient laparoscopic sterilization patients who had received either general anaesthesia or local anaesthesia together with intravenous sedation, it was concluded that local anaesthesia together with intravenous sedation is the method of choice for laparoscopic sterilization.

The concept of total intravenous anaesthesia (TIVA) with propofol- pentazocine is used for laparoscopic sterilization. The option of TIVA is ideal in situations with fewer gadgets. The problem of

airway maneuvering is avoided with a possibility of quick recovery thereby promoting the essential aim in a PHC set up i.e. early dischargibility.

There are other drugs like ketamine which is the commonest drug used in a peripheral set up. Usually additives like anticholinergics, narcotics, benzodiazepines are administered prior to ketamine to enhance its analgesic efficacy along with decreased side effects. This technique is both popular and possible both in laparoscopic and non-lap cases. Yet in non-lap cases where the sterilization is interval one, then the requirement of muscle relaxation is not catered by this technique. In this situation most of the anaesthetists prefer to administer 0.5 - 1 mg/kg of succinyl choline to enable easy picking of fallopian tubes. Yes! There are instances where scoline apnea was treated with fresh blood with continued manual ventilation. Now we will overview what the dire situation in a PHC set up. There will no monitors except a working/nonworking pulse oximeter. The administration does not incline to purchase many drugs as it will increase their clerical work burden and the problem of “disuse atrophy” to many drugs crossing the expiry line. The theatres and the anaesthesia machines are not maintained as the **big show of camps** comes *once* in a while. In many of the centres, the theatre personnel know the knack of holding the lithotomy position without stirrups. The head down position may get stuck at some time it may even difficult to retract it back. In many centres a small stool is kept at the rear end of the operating table to create a fixed trendelenberg position. Despite all these hiccoughs, the surgeons always come to our rescue. They are so unbelievably talented that, without much ado, finish the cases especially open tubectomies in a tight muscle scenario. *The PHC set ups have seen laparoscopic surgeons who finish around 600 cases in a day.* The average duration of surgery of a lap case is around three to five minutes with tubectomy in around 10 minutes. In incidences of perforation which rarely occur, they prefer to wait or transfer to a nearby institute for observation and further action. In laparoscopic anaesthesia, the most important problem we face is increased intraabdominal pressure and its consequences. The pneumoperitoneum is never created with carbon dioxide. Usually there is an air inflator, which when switched will push some air to establish adequate visibility for the attending surgeon but the push of air is blind. There is no monitoring of IAP. On many occasions, hand on pulse with pulse oximeter will be our monitors and only in exceptional cases does the blood pressure monitoring come into play. *In rare instances, the blood pressure apparatus will be used by the surgeon to create a pneumoperitoneum.* Hence in such mass camps, it is preferable to avoid sick

cases or patients with any systemic illness. There is an interesting Govt. recommendation on anaesthesia for sterilization. This allows all cases to be done with local anaesthetic technique along with preoperative IM narcotics. Still there are many surgeons who vehemently oppose this recommendation to request for additional anaesthetic administration. Hence, even with ketamine, the patient wakes in ten minutes and feeds in six to eight hours which paves way for a comfortable discharge.

The reported surgical complications, even though, very rare are:

1. Difficult identification and mobilization of the tubes
2. Local skin infections
3. Intraoperative bleeding
4. Delayed hemorrhage
5. Bowel laceration
6. Vascular injury

The first complication is the most frequent one which we encounter once in 25 – 30 camp cases in open tubectomies. Usually the anaesthesiologist administers either scoline or an additional dose of ketamine which can increase from 1 mg / kg to 1.5 mg /kg. The other complications are very rare to see apparently around 0.1 % even though we don't have exact statistics. A poor record maintenance is common in these surgeries and usually minor complications are not recorded for want of time to do the writing work. This forms a major hurdle to emphatically state that the anaesthetic technique of IVA with ketamine used is valid, effective, safe and cost friendly.

Postoperative period:

Regarding postoperative pain care, there are numerous techniques described.

In laparoscopic sterilization, the pain is thought to be a result of tubal ischaemia secondary to the application of Filshie clips or Falope rings to the Fallopian tubes and is intense for the first few hours then subsides. Techniques have been described involving instillation of local anaesthetic blindly into the peritoneal cavity, through the cervix, directly onto the Fallopian tubes and by direct injection into the mesosalpinx. These techniques are limited to a single application of local

anaesthetic at the end of surgery. Repeated instillation of local anaesthetics via a catheter placed in the pouch of douglas through an intra-operative port and a touhy needle is described.

In the postoperative period of cases done in a PHC set up, except in rare instances, the patients will be followed for 10 to 15 minutes followed by shifting them to ward where usually one staff nurse takes care of an astonishing 70 – 80 patients. The care about postoperative pain is all about a diclofenac injection IM may be followed by a narcotic usually Inj. Pentazocine 30 mg IM.

To conclude, anaesthetic challenges in a PHC set up are huge even for minor surgeries like sterilization. The volume of cases and absence of gadgets make things a little more difficult. In preoperative spot assessment, patients with systemic illness are referred to higher institutions. The technique of TIVA with ketamine is a common technique with safety, efficacy and cost effectiveness. Postoperative care by medical people is not common. Pain relief is by parenteral (IM) pentazocine and diclofenac. With all these deficiencies, the primary health centres are able to muster 20 to 30 cases in each camp with absolutely nil major morbidity reminding us the safety margin of anaesthesia, the experience and the unbelievable skill of the surgeon and the anaesthesiologist.

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