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The use of mesh in hernia repair, risk management and the advantages of day surgery - Part 2 - Hernia Repair under Local anaesthesia

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There are a variety of anaesthetic techniques for repair of herniae. There are a multitude of factors which influence the decision, including:

- age,
- medical history,
- personality of the patient,
- build,
- type of hernia repaired, and
- the preference of the patient and surgeon.

Key words: day surgery, hernia, mesh, local anaesthesia

The major choices available are:

1. GENERAL ANAESTHETIC

Using either:

a. relaxant anaesthetic, or

b. spontaneous respiration.

While a relaxant anaesthetic requires intubation of the patient, it gives muscular relaxation and good exposure of the area.

Spontaneous respiration is not as readily controlled. The surgical exposure however, is usually satisfactory.

Even with general anaesthesia local anaesthetics can also be infiltrated to:

reduce the depth of anaesthesia required

provide post operative pain relief.

The local anaesthetic agents or adrenaline should no have any adverse effect or interaction with the general anaesthetic agents or medication being used.

2. SPINAL ANAESTHETIC

This is advocated by some in specific circumstances or for repair of bilateral inguinal herniae, but would not be the method of choice in most centres.

3. LOCAL ANAESTHESIA INFILTRATION, NERVE BLOCK AND SEDATION

Local anaesthetic is infiltrated into the skin, subcutaneous tissue and around the hernia. Specific nerves may also be blocked. Oral and IV sedation are also used. Diazepam and Lorezapam do not relieve pain, but do have amnesic properties. The depth of sedation is tailored to the circumstances.

The presence of an anaesthetist for a pre-operative check and care during the surgery is reassuring and regarded by most as essential.

This technique is used exclusively in some centres of excellence. However, other surgeons rarely use this technique. This may reflect on the social patterns, the patient's preference or the belief by the surgeon that general anaesthesia provides better operating conditions for the patient.

There have been dramatic changes in management. Earlier mobilisation has meant reduced time in hospital. The aim is a rapid recovery and an early return to normal activity or the work-force.

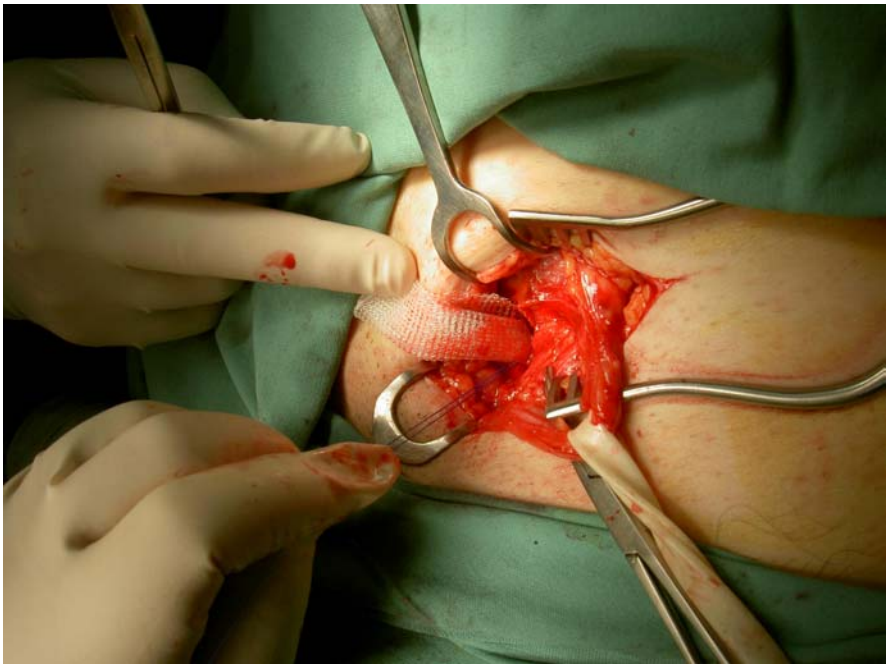
General anaesthesia has become increasingly sophisticated and safer. The decreased likelihood of mishaps with increased specialisation suggests that general anaesthesia should be the preferred method.

However, as general anaesthetic has improved there are still those who postulate on the effects of hypoxia, fall in blood pressure and other changes which may be associated with general anaesthesia – especially in the elderly. These factors, together with increasing costs and the demand on hospital beds means more and more surgery is performed under local anaesthesia and in day care centres.

Not all medical personnel or the public are aware of the ease of hernia repair using local anaesthesia. However some patients request local anaesthetic because of a previous bad experience with general anaesthesia. The majority leave these choices to their primary care practitioners and the surgeon in charge of their case. The patient should not be bludgeoned into this technique. Following explanation they usually agree.

There are cases where general anaesthesia may be preferable –

- children,
- the obese,
- the very large hernia
- the complicated hernia, and
- bilateral herniae.



It is more difficult to perform bilateral hernia repair under local anaesthesia because of the volume of local anaesthetic required and the time taken to do the procedures. Some believe that performing surgery on both sides at the one time leads to an increased risk of complications and recurrence due to excessive tension on the repair.

Two to three days can be left to lapse between sides, but this is often inconvenient and costly because of longer hospitalisation. The overall benefits are thought by some to be worthwhile.

PRE-OPERATIVE MANAGEMENT

Psychological preparation

Most patients are apprehensive before any procedure, whether it be local anaesthetic or general anaesthetic. A calm reassuring manner, with confidence in the technique will go a long way –

a. at the initial consultation

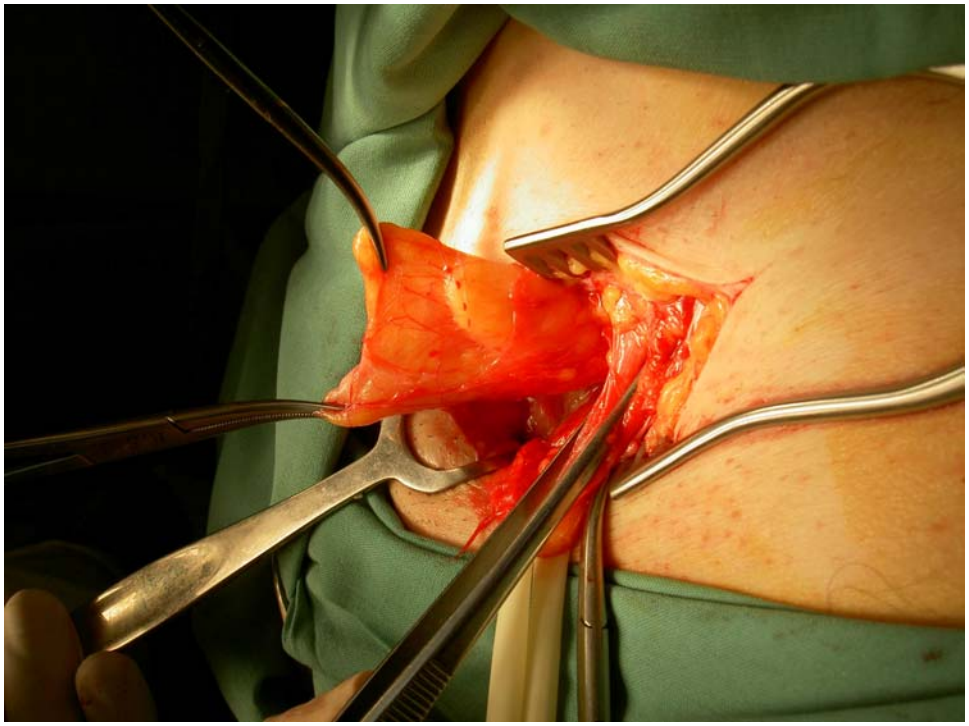
b. in the hospital pre-operatively, and

c. in the theatre area.

This approach is essential at all stages.

Premedication

It is not usually necessary to use Atropine or any such drying agent pre-operatively when using local anaesthetic. Oral or parenteral analgesics or hypnotics may be given.



MANAGEMENT IN THEATRE

The patient's face is screened off from the operating area. Some patients request to view the steps in the procedure but this is usually resisted.

The patient is monitored as with a general anaesthetic. The pulse, blood pressure and respiratory rate are recorded. Oxygen levels can be monitored simply now, with an oxygen monitor. It is surprising the low levels sometimes attained.

The patient appreciates an explanation of the measures. This distracts the patient and reduces anxiety. When the incision has been made the patient fully relaxes, knowing that all is well and that there is no risk of pain.

AGENTS USED

There are a variety of agents and concentrations available for use but generally it is preferable to persevere with two and become completely familiar with these.

1. Local Anaesthetic

A combination of lignocaine (short acting) – 20 cc of 1.5% solution with adrenaline 1 in 200,000 is combined with Bupivicaine (longer acting) – 20 cc of 0.5% solution.

When using two different agents, one must consider their effects are synergistic and additive. That is, the dosage of each should be reduced by half to prevent risks of toxicity.

The aims are –

rapid onset of action,

satisfactory anaesthesia for the duration of the surgery, and

to provide analgesia well into the post operative period.

This should be achieved without risk of any toxic reaction. Sedation reduces risk of toxicity. However, the toxic levels should not be exceeded under any circumstances. There is patient variation in absorption of the local anaesthetic and effects. This can be influenced by such factors as liver and renal function and the general state of health of the patient. Suggested maximum dosage for a 70kg healthy person is 4 mg per kg of Lignocaine plain or 7mg/12 kg adrenaline. Maximum doses of Bupivicaine are 2mg/kg.

These two agents can be mixed. A typical combination would be 20 cc of 1.5% Lignocaine with adrenaline mixed with 20 cc of 0.5% Marcaine.

Adrenaline 1 in 200,000 diluted to 1 in 400,000 is routinely used. This concentration is enough to cause vaso-constriction, decrease the absorption of the local anaesthetic and reduce the risk of toxic reaction due to the local anaesthetic. It increases the dose of local anaesthetic which may be administered. The adrenaline itself rarely causes any problem. Care with a patient with cardiac disease or sensitivity to adrenalin should be taken. The volume given at this concentration is very unlikely to have any harmful effect. Mono-amine oxidase inhibitors should be stopped two weeks prior to surgery to prevent any hypertensive crisis.

Adrenalin is theoretically a problem as it could constrict the testicular artery. However it has not been implicated as a cause of testicular atrophy and it is used routinely in both series without having any harmful effect.

1. I/V Sedation

Each surgeon and anaesthetist varies the dosage and depth of sedation based on the needs or anxiety of the patient.

Team work between the surgeon and anaesthetist should achieve a satisfactory combination. Sometimes inappropriate sedation results in a confused patient, which would only make surgery difficult. This problem usually only occurs when the anaesthetist and surgeon have not worked on this technique together previously.

Skin Preparation

Shaving may be performed in the ward or in the theatre immediately pre-operatively. Too early shaving can lead to colonisation of the small nicks with bacteria resulting in wound infection. Depilatory creams are becoming increasingly used.

An antiseptic body wash is recommended pre-operatively to reduce the risk of infection.

The skin is prepped again with antiseptic in theatre. The antiseptic can be warmed so that the patient does not get a fright with the cold solution. The patient should be informed of any movements that are to take place as well as when the injection will be administered. An alcoholic solution should not be used near the scrotum because it can sting and irritate the sensitive skin. If diathermy is being used and alcohol is splashed nearby ignition can occur.

Alternatively, Povodine iodine solution can be used. The colour makes it more difficult to see where the local anaesthetic has been administered. There is a similar problem when drapes are applied. While both these problems can be overcome by marking, injection into this mark can cause tattooing.

Diathermy

Diathermy may be used for haemostasis. However the whole procedure can be performed without its use. Diathermy has the disadvantage of having to place a sticky plate on the patient who, often needs additional shaving.

There is a small incidence of complications from diathermy, such as burns, particularly is alcoholic skin preps are used. There is a smell and noise. Tissue necrosis can result in infection. Diathermy is not as certain a method as haemostasis as ligature for larger vessels and should not be relied upon solely. Bruising is more common with the use of local anaesthesia making haemostasis vital.

Techniques of Local Anaesthesia

The surgeon usually injects the local anaesthetic after the skin is prepped and the site draped. Some anaesthetists or surgeons do this earlier, either in the pre-op area or in theatre, to allow the local anaesthetic to take effect longer.

2. Nerve Block

For inguinal hernia repair, a ilio-inguinal and ilio-hypogastric nerve block is performed. These are approximately 1.5 cm supero-medially to the anterior superior iliac spine. The nerves are situated deep to the external oblique and the resistance to this muscle can be felt during the injection. The ilio-inguinal nerve supplies the sensory fibres to the skin where an incision is to be made.

3. Skin and Subcutaneous tissue infiltration

The skin is infiltrated along the site of the proposed incision. Epidermal injection rather than into the subcutaneous fat gives a rapid onset of action. It tends to sting a little more initially. The subcutaneous fat is then infiltrated. The local anaesthetic can be infiltrated deep to the external oblique before any incision is made. Should this be done, one must aspirate first to ensure the local anaesthetic is not injected in a bolus into vein. As the needle penetrates through the external oblique a giving sensation is experienced. This layer can be anaesthetised under direct vision following division of the subcutaneous fat. The superficial vessels are then ligated to give tome for the local anaesthetic to take effect.

After the external oblique is divided, further local anaesthetic can be administered into specific sites.

In dealing with the sac, gentle technique avoids local and referred pain into the scrotum, testis or intra-abdominally. Occasionally some vaso-vagal effect is noted with the slowing of the pulse and a fall in the blood pressure if excessive traction is applied. More local anaesthetic is used if there is pain. Atropine 1.2 mg I/V, or intravenous fluid are used to counteract the vaso-vagal effects if these are severe or prolonged.

The contents can usually be dealt with under local anaesthetic

During the procedure the patient is relaxed and there is no obvious muscular tension making surgery difficult.

The patient can cough or strain to demonstrate the protrusion of the hernia. Following removal of the sac further coughing demonstrates the efficiency of this. The tension on the sutures and adequacy of repair can be tested.

Other herniae can be repaired using local anaesthetic.

The uncomplicated femoral hernia repair (from below the inguinal ligament) is ideally suited to repair under local anesthetic. Small, epigastric para-umbilical and umbilical hernia can be repaired using the same agents and similar infiltration technique.

Conclusion

Hernia repair using local anaesthetic and sedation is a very effective method of anaesthesia for hernia repair in experienced hands. Each surgeon and anaesthetist will use different degrees of sedation. It should however be remembered that analgesia is not achieved by sedation, but by correct use of local anaesthetic and a gentle technique.