

Epidual and spinal anaesthesia have no place in a busy day unit?

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Abstract

Properly performed day-care anaesthesia is almost 100% safe in terms of serious adverse outcome, regardless of which anaesthetic method is used. The drawbacks of spinal anaesthesia includes occasional postoperative headache and transient radicular irritation. Epidural anaesthesia may prolong preoperative time consumed and occasionally fail. Both methods may prolong postoperative bedrest, but provide better analgesia and emesis protection than general anaesthesia. Epidural anaesthesia may occasionally be useful in selected long-lasting procedures. Spinal anaesthesia is simple, fast, reliable and should be considered for procedures of medium to long duration when some postoperative pain is expected. © 1997 Elsevier Science B.V.

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1. Introduction

Whereas epidural and spinal anaesthesia are generally accepted for many types of in-patient surgery, their use in an ambulatory setting has been controversial. Some ambulatory units do not use these methods at all, whereas other use them for 20–40% of their adult outpatients [1]. Thus, a careful examination of the characteristics of these methods with special reference to the ambulatory surgical patient, seems warranted. Important aspects which should be taken into consideration include the safety, quality and economy associated with the use of epidural or spinal anaesthesia. Alternative methods may be either general anaesthesia, local anaesthesia or monitored anaesthesia care (MAC). Whereas the two latter methods may prove excellent results in skilled hands for appropriate patients, the emphasis in this discussion will be on the alternative of general anaesthesia.

2. Anaesthetic safety

In his survey of 45 090 ambulatory surgical patients, Warner et al. concluded that major morbidity and mortality were comparable with a non-surgical population [2]. A total of 4059 of his patients received regional anaesthesia, and when asked 1 month after surgery, reported no higher incidence of major complications compared to general anaesthesia, [2]. However, in present anaesthetic practice, major permanent harm from anaesthesia is so rare that it is very hard to show differences between anaesthetic methods in any reasonably sized study population [3]. Thus, the study of potential 'worst case' problems and case reports must also be used for safety considerations.

2.1. Safety problems with general anaesthesia

The most frequent safety problems [4] with general anaesthesia refer to respiratory depression and problems with control of free airways and adequate ventilation. In the fragile patient the cardiodepressant effect of most general anaesthetic agents may also be a concern; whereas rare cases of anaphylactoid reactions, malignant hypertermia and organ toxicity may cause life-threatening situations.

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2.2. Safety problems with epidural or spinal anaesthesia

Whereas respiratory and airway problems are very rare with these techniques, cardiovascular complications may be a concern [5]. Hypotension at the onset of the block may be a problem, and occasional reports of bradycardia and even cardiac arrest have evolved from high thoracic blocks in susceptible patients [6]. With epidural anaesthesia, general convulsant and cardiopressive effects from large doses of local anaesthetic drugs injected inadvertently into the general circulation, may cause serious problems. With both epidural and spinal anaesthesia, neurologic damage to the spinal nerves or the spinal cord may evolve as a result of neurotoxicity from local anaesthetic drugs. Needle tearing into nervous tissue or formation of a haematoma or abscess after the needle puncture may cause mechanical damage. Whereas paraesthesia may occur during administration of epidural or spinal anaesthesia, these should not result in permanent damage in an awake patient when the needle is withdrawn and the injection stopped [7]. In a large prospective study of mostly in-patients, 8501 cases of spinal anaesthesia resulted in three permanent lesions. Two of these patients received continued injection in spite of pain, in one cancer patient 100 mg lidocaine in a 5% solution were administered [8].

2.3. Neurotoxicity

This complication has been a major concern especially after spinal anaesthesia, when high a concentration of local anaesthetic drug is put very close to the cord or nerve tissue. At present it seems justified to identify two different forms of toxicity; the permanent toxic nerve injury and the transient radicular irritation (TRI).

2.4. Permanent toxic nerve injury

Whereas bupivacaine in clinical concentrations is considered safe in this aspect, reports of permanent nerve or cord damage have been encountered after tetracaine and lidocaine. On an isolated frog nerve, lidocaine 5% is toxic within 15–20 min, whereas less than 1% in solution is safe [9]. From the clinical reports, it seems likely that too many molecules of lidocaine concentrated at a spinal site may cause damage. The most serious reports have been after repetitive administration of lidocaine through spinal catheters [10], but repeated lidocaine spinals and single lidocaine spinals of 100 mg or more in a 5% solution have also caused permanent damage [11]. It is reason to believe that the use of lidocaine in a 2% solution or less may eliminate the problem of permanent nerve damage. If the 5% solution is used, care should be taken to restrict

the dose to the 50–80 mg range, to dilute the injectate with spinal fluid aspiration and to never inject a second lidocaine spinal if the first fails.

2.5. Transient radicular irritation (TRI)

Whereas concentrated spinal lidocaine is the usual cause of this complication as well, TRI seems to be a different clinical entity compared with the permanent toxic nerve injury. TRI is mild, self-limiting within few days, without neurological signs of nerve damage. The symptoms include pain or dysaesthesia in the back or buttocks, radiating down the legs. With 2 or 5% lidocaine an incidence of up to 5–16% has been described, whereas the condition is rare with bupivacaine [12,13]. It is more frequently seen in patients after the lithotomy position, whereas the baricity or addition of epinephrine to the spinal injectate do not seem to make any difference [12,13].

2.6. Haematoma or abscess formation

These complications may be very serious if surgical decompression is not initiated within a few hours of onset of symptoms. With aseptic technique in outpatients with stable health, abscess formation should be almost non-existent. In the series of more than 18 000 epidurals and spinals reported by Dahlgren and Tornebrandt [8], no cases of infection occurred but three cases of hematoma caused permanent neurologic deficits. These were all after epidural anaesthesia prolonged for post-operative pain treatment in in-patients using anticoagulants [8]. Again, with appropriate technique [14] and patient population, hematoma formation should be extremely rare after epidural and spinal anaesthesia in an ambulatory surgical practice.

3. Problems of anaesthetic quality

As serious safety problems become very rare in modern anaesthetic practice, the focus of attention has been somewhat shifted as to the quality of care experienced by the patients.

3.1. Quality problems with general anaesthesia

Almost all cases of adult ambulatory general anaesthesia are induced with injection of propofol, which may cause localized pain [15]. When neuromuscular blocking agents are used as part of the technique, there is always a small risk of inadvertent awareness during the procedure, which may cause serious psychiatric problems afterwards [16]. The patients may feel very drowsy and complain about pain, nausea or vomiting after general anaesthesia. Sore throat may be a result of

intubation or the use of a laryngeal mask [17], whereas use of suxamethonium may result in muscle aching [18].

3.2. Quality problems with epidural and spinal anaesthesia

Skin puncture with the epidural or spinal needle may be unacceptably painful and frightening in some patients [19]. Use of local anaesthetic skin ointment, fine needle local anaesthesia infiltration or i.v. opioids in front, may alleviate the pain; but a reassuring talk is usually sufficient for most patients. Occasional cases of block failure may result after epidural anaesthesia, but should be very rare after spinal anaesthesia in experienced hands. However, also with spinal anaesthesia the option of giving general anaesthesia should be at hand if the surgical procedure outlasts the duration of the block. With both epidural and spinal anaesthesia per-operative nausea may be a problem if care is not taken to avoid hypotension. A positive quality feature with these blocks are the choice of per-operative options which may be offered to the patients. Some patients want to be awake and discuss the case with the surgeon or watch the surgery on a monitor, some want slight sedation or music on headphones, some want to be asleep. Epidural and spinal anaesthetic patients, in general, have less postoperative pain and less nausea or vomiting compared with patients receiving general anaesthesia [19–21]. However, quality problems may arise after discharge in terms of transient radicular irritation (see above) and post-dura puncture headache (PDPH).

3.3. Post-dura puncture headache (PDPH)

An accidental dura puncture [22,23] with a large bore epidural needle may have a risk of PDPH of about 50%. Spinal anaesthesia with 25 G Quincke needles have been reported to carry as much as a 37% incidence of PDPH in young men [24]. However, with present available thin needles with an atraumatic tip design (i.e. 27 G pencil point), the PDPH figures should be less than 2%, even in young adults [22]. It should also be remembered that PDPH is benign and self-limiting, usually within a few days. If the symptoms are strong, epidural blood-patch treatment is immediately efficient in 90% of the cases [22].

4. Economic considerations

Better cost-effectiveness is one of the major driving forces in the development and growth of ambulatory surgery. When comparing epidural and spinal anaesthesia with general anaesthesia in this setting, important aspects include costs of drugs and equipment, as well as delays and extra work with either method [21].

4.1. Drugs and disposable equipment

Although drugs and disposable equipment accounts for a minor part of overall anaesthetic costs, differences may still be of interest. Spinal and epidural drugs and equipment are generally cheap; whereas many of the new and best drugs for general anaesthetic ambulatory care are more expensive; including propofol, sevoflurane, ondansetron, remifentanyl and muscle relaxants.

4.2. Peri-operative delays

Both spinal anaesthesia and particular epidural anaesthesia may take longer to administer than a general anaesthetic induction [21], and for the epidural block there is a delay while waiting for the block to become efficient as well. The latter may not be a problem if the unit has an induction room or the onset time is used to wash and drape the patient in the operating theatre. Postoperative delay with the epidural and spinal anaesthetic technique is mainly due to prolonged leg paralyses. In our study of knee-arthroscopy [21] leg muscle strength was impaired for 78 min post-operatively after lidocaine spinal anaesthesia and 124 min after mepivacaine epidural anaesthesia [21]. With dilute lidocaine 0.5% [25] or procaine [26] for spinal anaesthesia, total block duration may be shortened to less than 1.5 h. Occasional urinary retention may be a problem after epidural or spinal anaesthesia, but should be diminished by using short acting agents [22], avoiding bupivacaine.

With general anaesthesia, slow emergence may result in a delay to wheeling the patient out from the operating theatre [21]. Pain and nausea or vomiting are the most frequent causes of delayed discharge after ambulatory surgery and these occur more frequently after general anaesthesia [19,22].

4.3. Extra work load

After general anaesthesia a drowsy patient may require increased attention, as well as a patient with pain or nausea may do. Un-anticipated admissions are usually caused by these complications. With epidural and spinal anaesthesia post-dura puncture headache and transient radicular irritation may cause problems and extra work after discharge.

5. Conclusions

5.1. Epidural anaesthesia

Epidural anaesthesia provides excellent and adjustable per- and post-operative analgesia. However.

the method is associated with pre- and post-operative delay and has a risk of failure and accidental dura puncture. Epidural anaesthesia seems indicated only for special cases in an ambulatory setting; such may be prolonged orthopedic procedures, patients with a strong preference for the method and as a backup (i.e. spinal anaesthesia + epidural catheter) for spinal anaesthesia when the surgery is of very unpredictable duration.

5.2. Spinal anaesthesia

Spinal anaesthesia is easy, fast, cheap and reliable. As with epidural anaesthesia, the incidences of postoperative pain and nausea are low. The drawbacks are a possible delay of postoperative discharge and the occurrence of transient postdischarge side-effects in some patients. Spinal anaesthesia seems highly appropriate in an ambulatory clinic for procedures of medium to long duration, when some postoperative pain is expected. Cases of airway problems (e.g. rheumatoid arthritis, face down position on the table) and patients with a strong desire to being awake may be other indications. A proper technique should be used: only lidocaine in a 2% or less solution, 27 G pencil point needles to all patients less than 50 years of age.

With both epidural and spinal anaesthesia it is important that both the patient and the surgeon accept the method. All the patients should be informed about the symptoms of possible late side-effects. A telephone call the day after surgery should be undertaken.

With these guidelines; epidural, and especially spinal anaesthesia, should have a place in the busy day unit.

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