Volume-4, Issue-12, Dec-2015 • ISSN No 2277 - 8160

Research Paper Medical Science

Anaesthesia for ambulatory anorectal surgery

Dr Surendra Kumar Jain Associate Professor General Surgery, JNUIMSRC Jagatpura Jaipur

Dr Sanjeev D. Jain Specialist anesthesia and critical care, Al Wakra Hospial Qatar

ABSTRACT

The prevalence of minor anorectal diseases is 4–5% of adult Western population. Operations are performed on ambulatory or 24-hour stay basis. Requirements f or ambulatory anaesthesia are: rapid onset and recovery, ability to provide quick adjustments during maintenance, lack of intraoperative and postoperative side effects, and cost effectiveness.

Anorectal surgery requires deep levels of anaesthesia. The aim is achieved with 1) regional blocks alone or in combination with monitored anaesthesia care or 2) deep general anaesthesia, usually with muscle relaxants and tracheal intubation. Modern general anaesthetics provide smooth, quickly adjustable anaesthesia and are a good choice for ambulatory surgery. Popular regional methods are: spinal anaesthesia, caudal blockade, posterior perineal blockade and local anaesthesia. The trend in regional anaesthesia is lowering the dose of local anaesthetic, providing selective segmental block. Adjuvants potentiating analgesia are recommended.

Postoperative period may be complicated by: 1) severe pain, 2) urinary retention due to common nerve supply, and 3) surgical bleeding. Complications may lead to hospital admission. In conclusion, novel general anaesthetics are recommended for ambulatory anorectal surgery. Further studies to determine an optimal dose and method are needed in the group of regional anaesthesia.

KEYWORDS : Anaethesia, ambulatory anorectal surgery

Introduction

Minor anorectal diseases are rather common. The prevalence of haemorrhoids and other anorectal diseases is 4–5% in adult population in the United States; approximately 10% of the cases require an operation (1). According to Argov (2), internal haemorrhoids are present in 4 per cent of Western adult population. L. E. Smith already in 1986 recommended 90% of anorectal surgery to be performed on ambulatory basis (3). While organizing an ambulatory centre it is essential to select patients with respect to main and concurrent diseases, to determine preoperative preparation, perioperative care, optimal anaesthesia and criteria for home-readiness. The article presents a review of earlier popular and recently introduced methods of anaesthesia and problems in postoperative period with respect to applicability for ambulatory surgery.

Minor anorectal diseases

Anorectal benign diseases are haemorrhoids, anorectal fistulas, anal fissures, pilonidal sinuses, papillomas, anal condylomas and paraproctitis. Paraproctitis and haemorrhoid thrombosis are treated as acute cases, while other ones are operated electively. Haemorrhoids, anal fissures and fistulas are the most common.

Anaesthesia and postoperative period

Some 20–30 years ago anorectal surgery was regarded as extremely painful. The operation itself takes a rather short time and under adequate anaesthesia usually goes uneventfully. Intensive pain in the operated zone and functional disorders of adjacent organs are distinctive for the postoperative period (5, 6). Functional disorders of rectum, urinary bladder and sexual organs are caused not only by the operation but insufficient postoperative analgesia or care.

Attempts are made to make minimal invasive operations to prevent narrowing or atonia of anal canal (7).

Anaesthesia

Anorectal surgery requires deep anaesthesia because the zone gets multiple nerve supply and is reflexogenic (8). Operations under light planes of anaesthesia cause intense pain, reflex body movements, tachypnea and laryngeal spasm, the so-called Brewer– Luckhardt reflex (9, 10). Painful stimuli can be blocked either with regional or deep general anaesthesia, usually with muscle relaxants and tracheal intubation. A variability of methods including general, spinal, caudal, local and combined techniques is used worldwide (1, 4, 11–16). There is no ideal method, each of them having advantages and disadvantages.

L. E. Smith has proposed that 90% of anorectal surgery could be carried out on ambulatory basis (3). R. Pietroletti et al. performed anorectal procedures in 24-hour stay centre (4). Outpatient anorectal procedures make 60% in France (14). The reasons for transferring to inpatient department are bleeding, urinary retention, severe pain, etc. (4).

General anaesthesia

There is no ideal anaesthetic for ambulatory surgery. Though some authors deny the effect of anaesthesia to home-readiness (17), an ideal general anaesthetic should:

1. Provide a rapid and smooth onset of effect;
2. Produce sedation, hypnosis, amnesia, analgesia, and muscle relaxation;
3. Lack intraoperative side effects (e.g. cardiovascular instability, respiratory depression, spontaneous movements, or excitatory activity);
4. Possess a rapid recovery profile without postoperative side effects;
5. Provide residual analgesia during the early postoperative period;
6. Represent a cost-effective alternative to currently used drugs (18).

Anaesthesia for ambulatory anorectal surgery should be deep and easily adjustable. When standard general anaesthetics are used the duration of anaesthesia significantly outlasts the duration of operation. Postoperative period can be complicated by such events like residual effects of anaesthetics, nausea and vomiting and severe pain (19). Postoperative side effects lead to prolonged hospital stay.

Neuromuscular blocker succinylcholine has a rapid onset and short duration of action. But it may not be a suitable choice for day-case patients because the incidence of succinylcholine-induced myalgias is reported to be from 45 to 85% (19). Pretreatment with small doses of a non-depolarizing muscle relaxant before succinylcholine administration is reported not to reduce the incidence substantially, postoperative myalgias still ranging from 20 to 70% (20).

The role of opioids in day-case surgery is controversial because of their well-known side effects, especially nausea and vomiting. A single dose of morphine can lead to postoperative nausea and vomiting.

It is emphasized that pain itself is a major cause of nausea and vomiting and opioids may be antiemetic when given to relieve pain. Several studies have demonstrated early ambulation and discharge after fentanyl -alfentanil-based anaesthetic techniques. However, there

is good evidence that avoidance of opioids virtually abolishes the postoperative complaints of nausea and vomiting that preclude oral intake of fluids after surgery.

Several new drugs have significant advantages in terms of rapid onset, excellent analgesia and amnesia, good surgical conditions and early recovery. These drugs include sedative hypnotics such as propofol, analgesics such as remifentanil, alfentanil, ketorolac and tenoxicam, muscle relaxants such as mivacurium, rocuronium, rapacuronium and inhalational agents such as desflurane and sevoflurane (19). The above-mentioned anaesthetics are rather expensive and their availability is restricted in countries with lower economic development.

Regional anaesthesia

Regional anaesthesia provides pre-emptive analgesia. It can reduce or avoid the hazards and discomforts of general anaesthesia including sore throat, airway trauma and muscle pain. Regional blockades can be used alone, in combination with sedation techniques or as part of balanced analgesia with general anaesthesia. It is desirable that methods and drugs used for

regional anaesthesia in the ambulatory setting possess the same properties as drugs used for ambulatory general anaesthesia, i.e. rapid onset of action, adequate surgical anaesthesia, and rapid achievement of discharge criteria such as ambulation and urination. Regional anaesthesia also possesses disadvantages (Tables 1, 2) (19).

Table 1. Advantages of local/regional anaesthesia (adapted from G. E. Rudkin (65)

Advantages to patient:

Avoidance of general anesthetic with its related complications;
Minimal incidence of postoperative nausea and vomiting;
Improved postoperative pain relief;
Shortened recovery room time;
Ability to communicate with staff during surgery;
Ability to observe the procedure (arthroscopy),earlier mobilization.

Advantages to surgeon:

Enables accurate assessment of function before end of surgery;
Allows discussion of operative findings and treatment options at surgery.

Advantages for institution:

Options of direct transfer to second–stage recovery;
Shortened patient's time in recovery room;
Reduced postoperative nursing requirements;
Fewer hospital admissions (shoulder surgery,
breast augmentation surgery);
Overall reduction in facility costs.

Table 2. Disadvantages of local/regional anesthesia (adapted from G. E. Rudkin (65)

Takes longer because of:
Discussion with patient;
Block procedure; Onset time;
Gentle tissue handling;
Incomplete block necessitating supplementation or conversion to general anesthesia.
Requires surgeon and patient cooperation;
Risk of postspinal headache (spinal, CSE);
Prolonged block may result in urinary retention and delayed discharge (central blocks).

Nerve supply to anorectal area (8, 21–23)

Nerve supply is mixed, somatic and autonomic, common with other pelvic structures. Sympathetic supply comes from sympathetic chain to hypogastric plexus (getting branches from L1–L5) and celiac plexus (Th11–L2), and sympathetic nerves proceed to pelvic plexuses. Parasympathetic supply comes from ventral rami of S2–S4 and forms the pelvic splanchnic nerves. These join the sympathetic plexuses to then relay in tiny end – organ ganglia. Functionally, parasympathetic fibers provide rectal and bladder motor function, inhibit sphincteric muscle and cause genital vasodilatation. Sympathetic fibers inhibit visceral motor

function and provide contraction of sphincteric muscle. Somatic nerve supply to the pelvic floor and external sphincters comes from sacral plexus (L4–L5 and S1–S4 segments). Coccygeal zone gets nerve fibers from S4, S5 and Co1. The main somatic nerves are:

1. Pudendal nerve (S2–S4), it gives origin to inferior hemorrhoidal nerve, which supplies the external anal sphincter and perianal skin. Other branches of pudendal nerve supply some peripheral fibers of the levator ani as well as the vagina, the base of the bladder, ischio-cavernosus and bulbospongiosus muscles, penis and clitoris. Autonomic fibers supplying rectum and urinary bladder join the pudendal nerve.
2. Direct perineal branches from S3–S4 supply major part of levator ani, puborectalis and has afferent fibers from the anal canal and perianal skin.
3. Anococcygeal nerve (S4, S5, Co1) innervates the skin over the coccyx.
4. Superior gluteal nerve (L4 and L5, S1).
5. Inferior gluteal nerve (L5, S1, and S2).
6. Posterior femoral cutaneous nerve (S1–S3) gives supply to the skin of the inferior part of the gluteal region, the perineum and the back of the thigh and leg.
7. Perforating cutaneous nerve (S2 and S3) supplies the skin over the medial and lower parts of the gluteus maximus.

When applying regional anaesthesia it is essential to determine an optimal dose of local anaesthetics, i.e. to seek for a segmentary block of the operated area. If the operation is carried out exclusively outside of the anal canal it is sufficient to produce sacral block; however, a considerable traction of rectum requires a block up to Th10 level. Otherwise the patient will experience an unpleasant feeling of tension in the lower abdomen caused by unblocked autonomic nerve fibers (23).

Spinal anaesthesia (SA)

The first spinal anaesthesia was made in 1898. According to S. S. Liu (24) anaesthesiologists master spinal anaesthesia early during training with achievement > 90% technical success rate after only 40–70 supervised attempts. The technique seems to be simple and relatively inexpensive. SA in reduced doses is applied for adult anorectal surgery. Recommendations and techniques are changing throughout the years. The recent trend is the reduction of the dose and determining minimal effective dose of spinal anaesthetics. A single dose of 1.5–2 ml of 0.5% isobaric bupivacaine or 2% lidocaine was recommended by R. S. Atkinson (25) for anorectal operations. It is stated that a spinal anaesthesia with isobaric solutions, especially bupivacaine, is difficult to predict. Injection of a single dose of 5 mg isobaric bupivacaine results in a block from L5 up to Th2 level (26).

A little more predictable is hyperbaric spinal anaesthesia. The block raises a few segments higher compared to isobaric solution. The recommended dose for anorectal surgery is 1–1.5 ml of hyperbaric 0.5% bupivacaine or 5% lidocaine. The patient should be kept in the sitting position for 1 minute, and should lie down afterwards. There is another risk with hyperbaric solutions – the height of the block may rise a few segments when changing the patients' position on the operating table and in the ward. Therefore it is essential to monitor the patient.

Hypobaric SA is suitable when the operation is performed in knee–elbow or jack-knife position. M. Maroof et al. (12) recommended injecting a spinal dose of 5 ml 0.1% bupivacaine. The advantages of hypobaric SA are the absence of motor block and stable

haemodynamics.

Cardiovascular effects of spinal anaesthesia typically include a decrease in arterial blood pressure and central venous pressure with only minor decreases in heart rate, stroke volume and cardiac output (24). Nevertheless, early detection of sleep-like state, lack of spontaneous verbalization and treatment with epinephrine are essential in prevention of cardiac arrest.

Prophylactic administration of pharmacologic agents (ephedrine, epinephrine, phenyl epinephrine) may be more effective than prehydration for prevention of hypotension. A potential means for prevention

of hypotension is by manipulation of spinal anaesthesia to achieve a unilateral or restricted spread spinal block.

Postdural puncture headache (PDPH) is a complication of SA; even though not life threatening but restricting activities of daily life and causing hospital admission. The rate depends on patient age (> young), sex (> female), needle size and form of the needle tip.

As compared by M. McSwiney et al (27) when the needle is 20–22 G the rate of PDPH is 16, 4%, 25–26 G needle – 3.5%, 29 G needle – 1.37%. With the introduction of pencil-point needles, which rather separate than cut dura, the rate of PDPH has decreased down to less than 1%, and this makes SA suitable for ambulatory surgery (29).

The first reports about transitory radicular irritation (TRI) caused by spinal hyperbaric lidocaine date back to 1993. TRI appeared with the expansion of ambulatory surgery and early mobilization of patients. According to K. F. Hampl et al (29) the rate of TRI reaches 15–37% of SA, is common after administration of spinal lidocaine and other short–acting local anaesthetics and is not registered after bupivacaine (30). N. Dalgren (31) states that firstly, TRI typically occurs after a silent period after resolution of SA and secondly, it is associated with early mobilization i.e. is characteristic for ambulatory patients. K. F. Hampl (29), M. P. Corbey (32) explain TRI as a result of 1)pooling of highly concentrated hyperbaric solutions in sacral segments, in the zone of cauda equina resulting in direct neurotoxic effect and 2) traction of osseous, muscular and nervous structures due to compulsory positioning of the patient on the operating table and during postoperative transportation. In conclusion, the true reasons of TRI remain unclear. Lidocaine in clinical doses is not a neurotoxin but one cannot deny the fact that TRI is caused by direct toxic action of anaesthetic to nervous roots inside the spinal canal (31).

The danger of TRI has caused a decreased use of spinal lidocaine, particularly hyperbaric. Searches are made to find an alternative local anaesthetic in the ambulatory setting. B. Ben–David et al (33) have stated that a long-acting local anaesthetic bupivacaine can cause a long-lasting motor blockade and urinary retention leading to prolonged hospital stay. There is an increased interest in low-dose bupivacaine (33) and unilateral SA (34) used for orthopaedic and gynaecologic surgery. Selective spinal anaesthesia (SSA) with minimal doses of local anaesthetics resulting in restricted spread of SA was introduced into practice (35). The technique is under research agenda: there are published articles on SSA in orthopaedics and traumatology with 4–6 mg hyperbaric bupivacaine, in gynaecology with 7.5 mg hyperbaric bupivacaine (36). Attempts are made to find an alternative to bupivacaine with less cardiac and neurotoxicity and less intensive motor block. A work by F. Lopez-Santoriano et al (37) demonstrated certain advantages of 12.5 mg 0. 5% hyperbaric ropivacaine compared to 12.5 mg 0.5% hyperbaric bupivacaine: duration and intensity of the sensory-motor blockade was less and fewer cardiovascular side effects developed. E. A. Alley et al (38) compared hyperbaric levobupivacaine to hyperbaric bupivacaine and found them to be equipotent in equal doses of 4–12 mg. Advantages of levobupivacaine are as follows: a wide margin between the therapeutic and toxic dose, lower cardiac toxicity compared to bupivacaine, with indistinguishable clinical efficacy.

There has been recent interest in using analgesic additives to spinal local anaesthetics to decrease the dose of local anaesthetic for faster recovery while maintaining or improving anaesthetic success (24). An optimal analgesic additive would increase anaesthetic success while sparing local anaesthetic and decreasing time until discharge. Multiple analgesics are active in the spinal cord and could potentially be used as spinal anesthesia additives. However, analgesic activity (dose response, effects on acute vs. chronic pain) and neurotoxicity have not been fully evaluated for the multitude of known analgesics. Reasonably well-investigated agents are vasoconstrictors, opioids and Alpha2 adrenoreceptor agonists.

Spinal anesthesia is a safe, simple, popular anesthetic technique. New local anesthetics, analgesic additives, and techniques are being investigated for different applications as the practice of medicine focuses on outpatient care (42).

Caudal Blockade (CA)

Caudal blockade was first used in Paris in 1901. Caudal block can be applied in a single-shot or continuous way with a catheter introduced in the epidural space. A single-shot technique is the method of choice for ambulatory surgery.

Advantages of CA compared to SA:

1. The level of anaesthesia is more predictable; the zone of the block directly depends on the injected volume of anaesthetic.
2. There is a possibility to produce a selective sensory and motor block in the anorectal area without motor block in legs, which leads to unrestricted ambulation and ability to fast discharge home.
3. There is almost no risk for such complications of SA as arterial hypotension, postdural puncture headache, and transitory radicular irritation.
4. The use of long-acting local anaesthetics produces prolonged postoperative analgesia (according to D.A. Berstock (44) up to 16 h).

There is one disadvantage of CA – a certain rate of failure in the adult population due to anatomical abnormalities of the sacrum. They are not uncommon and may consist of upward and downward displacement of the hiatus, pronounced narrowing or partial obliteration of the sacral canal, making needle insertion difficult, ossification of the sacrococcygeal membrane, absence of the bony posterior wall of the sacral canal, due to failure of laminae to fuse. The rate of failure is highly dependent of the anaesthesiologist's experience and reduces with practice. The rate of failure differs among authors: according to K. McCaul it is from 1 to 20% (45), A. C. Van Elstraete – 10% (15), J. Gudaityte – 12.5% (43), C. A. Adebamowo – 1% among black patients (13).

Recommended volumes of local anesthetic for CA:

- If the level of the block is desirable to reach L2–L4, i.e. for operations on the anus and rectum, perineum or urethra, circumcision, vaginal plastics – up to 30 ml.
- Uncomplicated hemorrhoidectomy, anal fissures – 15–22 ml (25).

Adjuvants

Adjuvants are recommended for CA to seek the same purposes as in SA. Epinephrine (5mg/ml),clonidine, and morphine are the most popular for CA (46). Ketamine has been used in pediatrics (47). A. C. Van Elstraete (16) has used caudal clonidine for adult anorectal surgery, and the period of analgesia was two times longer than in control group. A low (1 mg/kg) or intermediate (2 mg/kg) dose of clonidine increases the duration of postoperative analgesia without causing considerable changes in haemodynamics or sedation.

Conclusion

Caudal blockade is an old, simple technique of anaesthesia, suitable for ambulatory surgery. It gives no transitory neurologic symptoms and postdural puncture headache (which are potential risks of spinal anaesthesia). The rate of successful caudal blockade depends on sacral anatomical abnormalities in the adult population and the anaesthesiologist's experience.

Loco-regional and local anaesthesia

The techniques are popular in the ambulatory setting. Both are performed by the surgeon himself. Currently employed techniques are: (1) posterior perineal block, and (2) local anaesthesia of the anal canal and perianal skin.

Posterior perineal block was described by M. C. Marti (14). The zone of the anal canal is blocked in two levels following the direction of posterior perineal nerves (Figure: 1) superficial anaesthesia of superficial branches, like anococcygeal, perforating cutaneous, posterior femoral cutaneous nerve; 2) deep blockade of pudendal nerve and its branches haemorrhoidal, anterior sphincteric, dorsal nerve of penis or clitoris and perineal nerve. 1-2 ml of local anaesthetic solution are injected intradermally with the needle pushed towards the sacrum and 5 ml of the anaesthetic are injected presacrally. Afterwards another 10 ml are injected around ischiorectal muscle, then the needle is moved deeper in lateral and cranial directions, and perineal area is injected. The recommended safe dose of the anaesthetic solution is 40–60 ml.

Indications for posterior perineal block are: haemorrhoidectomy and other minor anorectal surgery in the ambulatory setting.

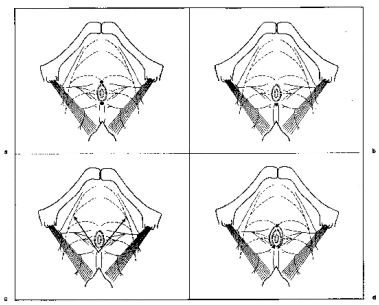

Figure 1. Technique of posterior perineal block:

hypodermic papules; b) infiltration of the presacral space to block the branches of the 4th sacral nerves; c) infiltration of the ischiorectal fossa by tilting the needle 45° cranially and 45° laterally; d) infiltration of the perianal groove.

2. Local anesthesia

Various techniques are applied. A subcutaneous injection of low volume anaesthetic solution followed by subendodermal and submucosal injection is described by M. C. Marti (17). It is recommended for excision of anal fissures, papillomas, uncomplicated mucocutaneous fistulas, and lateral sphincterotomy. Injection in the anorectal zone causes severe pain. The pain is caused not by the needle puncture but by injection of the anaesthetic. The skin below the dentate line is most sensitive. S. Nivatvongs (48) has proposed the anaesthetic solution (0.25% bupivacaine with adrenaline 5 mg/ml) to be injected with the help of anoscope submucosally 2 mm above the dentate line using a 27G needle and 3 ml syringe into four quadrants. The anaesthetic afterwards should be milked down below the dentate line to anesthetize the anoderm. The author states the injection causes little or no pain at all. In addition the block produces excellent relaxation of the anal canal. The next step is an injection below the dentate line to anaesthetize perianal skin. The technique is recommended for ambulatory and in patient surgery.

C. W. Sobrado et al. (49) described local anaesthesia using a hook-needle. With the help of an anoscope a hook-shaped, curved, 22G needle is inserted to puncture the mucosa just above the pectinate line down to the submucosal level, and 5 to 7 ml of anaesthetic solution are carefully and slowly infused (Figure 2). Depth of blockade is further extended to the level of the anal sphincter in each of the four quadrants. Use of the hook-shaped needle avoids manipulation of the perianal skin below dentate line, and thereby prevents painful sensation by the patient.

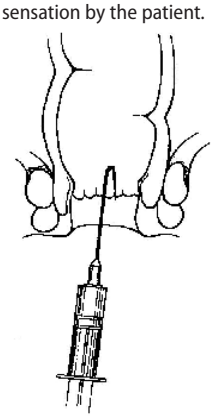

Figure 2. Painless puncture with a hook-needle above the dentate line **(according to C. W. Sobrado et al, 1996).**

Local anaesthetics and volumes for local anaesthesia

1. Lidocaine 0.5% 40-60 ml (max 200mg) without epinephrine; 0.5% 100 ml (500 mg) with epinephrine.
2. Bupivacaine 0.25% 60 ml (max 150 mg) with epinephrine1:200000.
3. Lidocaine 1% 15 ml bupivacaine 0.25% 15 ml General principles of safety of local anaesthesia (avoiding maximal dosage, slow injection, keeping close contact with the patient, early recognition of side effects) are the same as in general surgery.

New techniques

In order to improve patient safety and decrease discomfort, local anaesthesia is combined with intravenous sedation and *monitored anaesthesia care* (50, 51). The anaesthesiologist evaluates the patient's physical state, orders a premedication e.g. with intravenous midazolam 1–2 mg, some anaesthesiologists give additional ketorolac 30–60 mg for pre-emptive analgesia.

Intravenous fentanyl 25 mg is injected before infiltration with local anaesthetic; the anoderm is lubricated with 2% lidocaine gel. The operated area is infiltrated with the anaesthetic solution. Intraoperative sedation is achieved via infusion of propofol 50 mg/kg/min i/v keeping the patient's consciousness on 2–3 points in awareness/ sedation scale (5 = awake, 1 = sleeping). Fentanyl in i/v boluses of 25 mg is injected if needed.

Conclusion

Local blockades are performed by surgeons. Their choice depends on the skills of the operator, local tradition, and patient and surgeon cooperation.

Postoperative period

Urinary retention

Urinary retention is the most common complication following anorectal surgery. The rate can reach even 52%, according to other sources 32% (52, 53). J. P. Pertek (54) states that the rate of urinary retention does not depend on the method of anaesthesia. Studies concerning the effect of anaesthetics on urodynamics are rare. It is well estimated that *opioids* used in any form increase the probability of urinary retention especially when used in spinal or epidural way. Epidural morphine causes relaxation of detrusor muscle and increases capacity of urinary bladder (53). Spinal opioids directly anaesthetize sacral nociceptive neurons and autonomic centres with direct inhibition of supraspinal centres (55). M. Gentiliet al (56) hasve found that spinal clonidine caused urinary retention to less extent compared to morphine.

Urinary retention is more common when a long-acting local anaesthetic (bupivacaine) is used for spinal anaesthesia compared to short-acting anaesthetic (lidocaine). An excessive intravenous fluid infusion for correction of hypotension during spinal anaesthesia can lead to over extension of urinary bladder. This inhibits detrusor function, and normal reflex is not restored even after emptying urinary bladder with a catheter (52, 53).

Other provoking agents

Pain. Due to common nerve supply pain causes reflexive inhibition of urinating. Pain and tension in the anal canal through pudendal nerve and sacral segments cause sphincteric spasm and detrusor relaxation (55).

Factors predisposing urinary retention are:

- Former disturbances of urination, prostate diseases;
- Unfamiliar hospital surroundings, compulsory lying position;
- Postoperative constipation (57);
- Atonia of the urinary bladder.

Recommendations to avoid Urinary Retention

- The patient is recommended to urinate before the operation;
- If hemodynamic parameters permit, intravenous fluids are restricted during the operation to 5–7 ml/kg/h;
- Postoperative restriction of fluids is intravenous 5to 7 ml/kg/h, oral up to 300 ml until the first spontaneous voiding or catheterization; A single catheterization of urinary bladder is recommended, if the patient feels tension or discomfort and produces no spontaneous voiding 8 h after the operation;
- Care must be taken not to miss secondary retention. An effective spontaneous voiding is considered when there is a momentary production of > 150 ml of urine;
- Early ambulation, increasing of physical activities.

According to M. F. Mulroy (59) it is acceptable to discharge ambulatory patients without voiding if they meet other criteria. But anorectal surgery belongs to the group of risk for urinary retention. Therefore it is advisable to discharge those patients after they urinate.

In order to prevent secondary retention patients should be warned to seek hospital if they experience problems in urinating.

Normal defecation

Normal defecation depends on pain, the extent of the operation, interdependently on normal urination. Preventive measures for constipation include a special diet, early mobilization, effective pain relief, and early hospital discharge.

Pain

C. W. Sobrado (49) regards pain to be the most common disturbance complicating postoperative period of anorectal surgery. Postoperative pain management should be the same as following other surgery:

1. Non-steroidal anti-inflammatory drugs or paracetamol are recommended for *basic pain relief*. The oral way is advisable, if the patient can drink, and injectable form is used when the patient cannot take orals. Modern selective COX–2 inhibitors (*celecoxib, parecoxib*) are highly recommended (60). Their clinical efficacy is equal to morphine but they are not available in countries with limited sources. R. J.Place et al (6) has recommended the use of ketorolac 60 mg intravenously or as an adjunct to regional blockade with local anesthetics.
2. The *rescue analgesic* morphine or fentanyl should be administered in low intravenous doses when the intensity of pain is above 30 mm on a visual analogue scale (VAS) of 100 mm. H. Kehlet (61) recommends balanced analgesia, i.e. the use of multiple groups of analgesics potentiating each other's analgesic effect.
3. Preemptive analgesia with the first dose of an analgesic being used before the painful stimuli is highly advocated.
4. Regional blockades with local anaesthetics and their adjuvants for postoperative pain relief.
5. Early rehabilitation of functions and patient ambulation.
6. Other means. M. Coloma et al (51) recommend preoperative dexamethasone (4 mg i/v) potentiating other analgesics and acting as an antiemetic. J. H.Chiu et al. (63) described the use of transcutaneous electric nerve stimulation (TENS) as a component of postoperative analgesia. Effective pain management and minimal invasive surgery are essential in preventing chronic pain. According to G. C. Ger (64) 32% of patients with chronic rectal pain had experienced prior anal surgery.

The reasons and treatment of other possible postoperative complications (bleeding, post operative nausea and vomiting) are the same as in other surgery and therefore are not discussed.

Conclusions

Anorectal diseases rather common among adult population of the working age are to be treated operatively in ambulatory centres. This surgery requires deep anaesthesia, and postoperative period is followed by severe pain, urinary retention. Novel anaesthetics and analgesics with easily adjustable level of anaesthesia are recommended for general anaesthesia. Further studies to determine an optimal technique and dose are needed in the group of regional blockade.

REFERENCES

1. Li S, Coloma M, White PF, Watcha MF, Chiu JW, Li H, Huber PJ. Comparison of the costs and recovery profiles of three anaesthetic techniques for ambulatory anorectal surgery. Anesthesiology 2000;93(5):1225-30. 2. Argov S. Radical ambulatory haemorrhoidectomy. Harefuah 1994;126(4):189-91, 239. 3. Smith LE. Ambulatory surgery for anorectal diseases: an update. South Med J 1986;79(2):163-6. 4. Pietroletti R, Navarra L, Cianca G, Maggi G, Simi M. Proctological surgery in the one-day surgery regimen: the preliminary results with 232 patients. Ann Ital Chir 1998; 69(4):499-505. 5. Kotake Y, Matsumoto M, Ai K, Morisaki H, Takeda J. Additional droperidol, not butorphanol, augments epidural fentanyl analgesia following anorectal surgery. J Clin Anesth 2000;12(1):9-13. 6. Place R, Coloma M, White PF, Huber PJ, van Vlymen J, Simmang C. Ketorolac improves recovery after outpatient anorectal surgery. Dis Colon Rectum 2000;43(6):804-8. 7. Lin JK. Preservation of anal sphincter function after hemorrhoidectomy under local anesthesia. Zhongua Yi Xue Za Zhi 2001;64(9):519-24. 8. Erdman AG. Concise Anatomy for Anaesthesia. Sacral plexus, the autonomic nervous system. London: Greenwich Medical Media; 2002. p. 56, 59, 70-5. 9. Atkinson RS, Rushman GB, Davies NJ. Lee's synopsis of anaesthesia. Surgical operations and choice of anaesthetic.11th ed. Oxford: Butterworth-Heinemann Ltd.; 1993. p. 448-9. 10. Hutton P. Anaesthesia for coloproctology. In: Keighly MRB, Williams NS. Surgery of the Anus, Rectum, and Colon. W.B. Saunders Company, Ltd.; 1993. vol. 1. p. 128-39. 11. Fleisher M, Marini CP, Statman R, Capella J, Shevde K. Local anesthesia is superior to spinal anesthesia for anorectal surgical procedures. Am Surg 1994;60(11):812-5. 12. Maroof M, Khan RM, Siddique M, Tarique M. Hypobaric spinal anaesthesia gives selective sensory block for anorectal surgery. Can J Anaesth 1995;42(8):691-4. 13. Adebamowo CA, Ladipo JK, Ajao OG. Randomized comparison of agents for caudal anaesthesia in anal surgery. Br JSurg 1996;83(3):364-5. 14. Marti M Anesthesie loco-regionale en chirurgie proctologique. Ann Chir 1993;47(3):250-5. 15. Van Elstraete AC, Lebrun FP. Costs and recovery profiles of caudal anesthesia for anorectal surgery in adults. Anesthesiology 2001;95(3):813-4. 16. Van Elstraete AC, Pastureau F, Lebrun T, Mehdaoui H. Caudal clonidine for postoperative analgesia in adults. Br J Anaesth 2000;84(3):401-2. 17. Pavlin DJ, Rapp SE, Polissar NL, Malmgren JA, Koerschgen M, Keyes H. Factors affecting discharge time in adult outpatients. Anesth Analg 1998;87(4):816-26. 18. Smith I, Nathanson M, White PF. The role of sevoflurane in outpatient anesthesia. Anesth Analg 1995;81S:67-72. 19. Rawal N. Analgesia for day-case surgery. Br J Anaesth 2001;87(1):73-81. 20. Mikat-Stevens M, Sukhani R, Pappas AL, Fluder E, Kleinman B, Stevens RA. Is succinylcholine after pretreatment with d-tubocurarine and lidocaine contraindicated for outpatient anesthesia? Anesth Analg 2000;91:312-6. 21. Keighley MRB. Anatomy and Physiology. In: Keighley MRB, Williams NS. Surgery of the Anus, Rectum, and Colon. W.B. Saunders Company, Ltd.; 1993. vol. 1. p. 1-18. 22. Atkinson RS, Rushman GB, Davies NJ. Lee's Synopsis of Anaesthesia. Regional Techniques. 11th ed. Oxford: Butterworth-Heinemann, Ltd.; 1993. p. 674. 23. Löfström B. Illustrated Handbook in Local Anaesthesia. Caudal anaesthesia. Copenhagen: Munksgaard; 1969. p. 129-34. 24. Liu SS, McDonald SB. Current isssues in spinal anesthesia. Anesthesiology 2001;94(5):888-906. 25. Atkinson RS, Rushman GB, Davies NJ. Lee's Synopsis of Anaesthesia. Surgical operations and choice of anaesthetic.Spinal analgesia: intradural and extradural. 11th ed. Oxford: Butterworth-Heinemann, Ltd.; 1993. p. 448-9, 710, 733-4. 26. Capdevilla X. Nightmare in regional anaesthesia: the role of the procedure, device and local anaesthetic. Refresher course lecture. ESA 10th Annual Meeting; Nice; 2002. 27. McSwiney M, Phillips J. Postdural puncture headache. Acta Anaestesiol Scand 1995;39:990-5. 28. Crowhurst JA, Plaat F. Safety of fine-gauge, pencil point spinal needles. Anaesthesia 1998;53:1028-37. 29. Hampl KF, Heinzmann-Wiedmer S, Luginbuehl I, Harms C, Seeberger M, Schneider MC, Drasner K. Transient neurologic symptoms after spinal anesthesia. Anesthesiology 1998;88: 629-33. 30. Martinez-Burio R, Arzuaga M, Quintana JM, Aguilera L, Aguirre J, Sjez–Eguilaz JL, Arkzaga A. Incidence of transient neurologic symptoms after hyperbaric subarachnoid anaesthesia with 5% lidocaine and 5% prilocaine. Anesthesiology 1998;88:624-8. 31. Dahlgren N. Lidocaine toxicity: a technical knock-out below the waist? Acta Anaesthesiol Scand 1999;42:389-90. 32. Corbey MP, Bach AB. Transient radicular irritation (TRI) after spinal anesthesia in day-care surgery. Acta Anaesthesiol Scand 1999;42:425-9. 33. Ben-David B, Levin H, Solomon E. Spinal bupivacaine in ambulatory surgery: the effect of saline dilution. Anesth Analg1996;83:716-20. 34. Casati A, Fanelli G, Capperelli G. Low dose hyperbaric bupivacaine for unilateral spinal anesthesia. Can J Anaesth 1998;45:850-4. 35. Jukka V, Korhonen AM, Jokela RM, Ravaska P, Korttila K. Selective spinal anesthesia: a comparison of hyperbaric bupivacaine 4 mg versus 6 mg for outpatient knee arthroscopy. Anesth Analg 2001;93:1377-9. 36. Huffnagle SL, Norris MC, Huffnagle HJ, Leighton BL, Arkoosh VA. Intrathecal hyperbaric bupivacaine dose response in postpartum tubal ligation patients. Reg Anesth Pain Med 2002;27:284-8. 37. Lopez-Soriano F, Lajarin B, Rivas F, Verdu JM, Lopez-Robles J. Hyperbaric subarachnoid ropivacaine in ambulatory surgery: comparative study with hyperbaric bupivacaine. Rev Esp Anestesiol Reanim 2002;49(2):71-5. 38. Alley EA, Kopacz DJ, McDonald SB, Liu SS. Hyperbaric spinal levobupivacaine:a comparison with racemic bupivacaine in healthy volunteers. Anesth Analg 2002;94(1):188-93. 39. Eisenach JC, De Kock M, Klimscha W. 2-adrenergic agonists for regional anesthesia. Anesthesiology 1996; 85:655-74. 40. Dobrydnjov I, Samarütel J. Enhancement of intrathecal lidocaine by addition of local and systemic clonidine. Acta Anaesthesiol Scand 1999;43:556-62. 41. De Kock M, Gautier P, Fanard L, Hody JL, Lavand'homme P. Intrathecal ropivacaine and clonidine for ambulatory knee arthroscopy. Anesthesiology 2001;94(4):574-8. 42. Salinas FV, Liu SS. Spinal anaesthesia: local anaesthetics and adjuncts in the ambulatory setting. Best Pract Res Clin Anaesthesiol 2002;16(2):195-210. 43. Gudaitytė J, Marchertienė I, Pavalkis D. Kaudalinė blokada suaugusiųjų anorektalinėje chirugijoje. (Caudal blocade for adult patients in anorectal surgery.) Sveikatos mokslai 2002; 5:11-14. 44. Berstock DA. Haemorrhoidectomy without tears. Annals of the Royal College of Surgeons of England 1979;61:51-4. 45. McCaul K. Caudal blockade. In: Cousins MJ, Bridenbaugh PO. Neural blockade in clinical anesthesia and management of pain. 1st ed. Philadelphia: J. B. Lippincott; 1980. p. 275-92. 46. Sharpe P, Klein JR, Thompson JP, Rushman SC, Sherwin J, Wandles JG, Fell D. Analgesia for circumcision in a paediatric population: comparison of caudal bupivacaine alone with bupivacaine plus two doses of clonidine. Paediatr Anaesth 2001;11(6):695-700. 47. De Negri P, Ivani G, Visconti C, De Vivo P. How to prolong postoperative analgesia after caudal anaesthesia with ropivacaine in children: S-ketamine versus clonidine. Paediatr Anaesth 2001;11(6):679-83. 48. Nivatvongs S. An improved technique of local anesthesia for anorectal surgery. Dis Colon Rectum 1982;25:259-60. 49. Sobrado CW, Habr-Gama A. Hook-needle puncture. A new technique of local anesthesia for anorectal surgery. Dis Colon Rectum 1996;39(11):1330-1. 50. Read TE, Henry SE, Hovis RM, Fleshman JW, Birnbaum EH, Caushaj PF, Kodner IJ. Prospective evaluation of anesthetic technique for anorectal surgery. Dis Colon Rectum 2002;45(11):1553-8, 1558-60. 51. Coloma M, Duffy LL, White PF, Kendall Tongier W, Huber PJ Jr. Dexamethazone facilitates discharge after outpatient anorectal surgery. Anesth Analg 2001;92(1):85-8 52. Prasad M, Abcarian H. Urinary retention following operations for benign anorectal diseases. Dis Colon Rectum 1978; 21(7):490-2. 53. Petros JG, Bradley TM. Factors influencing postoperative urinary retention in patients undergoing surgery for benign anorectal disease. Am J Surg 1990;159(4):374-6. 54. Pertek JP, Haberer JP. Effects of anesthesia on postoperative micturition and urinary disorder. Ann Fr Anesth Reanim 1995;14(4):340-51. 55. Weiss H., Badlani G. Effects of anesthesia on micturition and urodynamics. In: International Anesthesiology Clinics, Anesthesia for Urological Surgery. Boston: Ph. W. Lebowitz, Little, Brown and Co; 1993. p.1-24. 56. Gentili M, Bonnet F. Spinal clonidine produces less urinary retention than spinal morphine. Br J Anaesth 1996;76:872-3. 57. Sarles JC. Urinary disorders following anorectal surgery. Schweiz Rundsch Med Prax 1990;79(26):838-40. 58. Cataldo PA, Senagore AJ. Does alpha sympathetic blockade prevent urinary retention following anorectal surgery? Dis Colon Rectum 1991;34:1113-6. 59. Mulroy MF, Salinas FV, Larkin KL, Polissar NL. Ambulatory surgery patients may be discharged before voiding after short acting spinal and epidural anesthesia. Anesthesiology 2002;97:315-9. 60. Camu F. Efficacy of a novel COX-2 specific inhibitor in the management of postoperative pain. Satellite symposium "New Treatment Strategies for Postoperative Pain". ESA 10th annual meeting; Nice; 2002. 61. Kehlet H. Balanced analgesia: a prerequisite for optimal recovery. Br J Surg 1998;85:3-4. 62. Coloma M, White PF, Huber PJ Jr, Tongier WK, Dullye KK, Duffy LL. The effect of ketorolac on recovery after anorectal surgery: intravenous versus losal administration. Anesth Analg 2000;90:1107-10. 63. Chiu JH, Chen WS, Chen CH, Jiang JK, Tang GJ, Lui WY, Lin JK. Effect of transcutaneous electrical nerve stimulation for pain relief on patients undergoing hemorrhoidectomy: prospective, randomized, controlled trial. Dis Colon Rectum 1999;42:180-5. 64. Ger GC, Wexner SD, Jorge JM, Lee E, Amaranath LA, Heymen S, et al. Evaluation and treatment of chronic intractable rectal pain – a frustrating endeavour. Dis Colon Rectum 1993;36:139-45. 65. Rudkin GE. Local and regional anaesthesia in the adult day surgery patient. In: Practical Anaesthesia and Analgesia for Day Surgery. Oxford: BIOS Scientific Publishers; 1997. p.207-10.