

## Review Article

**SPECIFIC ASPECTS OF ANESTHESIA IN PROCTOLOGY**Radmilo Janković<sup>1,2</sup>, Marija Stošić<sup>2</sup><sup>1</sup>Faculty of Medicine, University of Niš, Niš, Serbia<sup>2</sup>Clinic for Anesthesia and Intensive Therapy, Clinical Center Niš, Niš, Serbia

**Abstract.** *Proctology, as a domain of abdominal surgery, deals with the treatment of diseases affecting the end part of the large bowel, its terminal 20 cm, to which anus anatomically belongs as well. In view of the physiological role of this part of the digestive tract (stool control), all the diseases and disorders in the region cause patient discomfort and produce significant problems in everyday life. On account of that, diagnostic management should be performed promptly in order that effective treatments could be introduced as soon as possible. The most commonly used techniques of anesthesia in proctology are local anesthesia, independent or in combination with intravenous analgesedation, regional anesthesia (spinal and epidural), and general anesthesia. Local anesthesia combined with analgesedation has been the preferred approach in recent studies, since it is able to provide adequate settings for the planned surgery, patient comfort and minimization of side effects. An adequate anesthesia technique reduces metabolic response to surgical stress and length of hospitalization, which markedly affects cost-effectiveness of the treatment.*

**Key words:** *proctology, anesthesia, sedation, postoperative pain, PONV.*

**Introduction**

Proctology, as a domain of abdominal surgery, deals with the treatment of diseases affecting the end part of the large bowel – its terminal 20 cm – to which anus anatomically belongs as well. The most common symptoms and pathological signs in this region are bleeding, itching, pain, feeling of pressure, and the most common pathological conditions are hemorrhoids, anal abscesses, fistulas, fissures, condylomas and tumors. In view of the physiological role of this part of the digestive tract (stool control), all the diseases and disorders in the region cause great patient discomfort and produce significant problems in everyday life. On account of that, diagnostic management should be performed promptly in order that effective treatments could be introduced as soon as possible [1].

Hemorrhoids and other anorectal disorders occur in 4-5% of adults worldwide. Although most of these patients can be treated conservatively, in many of these cases surgical treatment is required. These surgical procedures are among the most common surgical interventions, with more than 90% of these performed in out-patient surgical settings [2]. An optimal anesthesia technique for such surgical procedures should provide an adequate surgical setting, rapid patient recovery, minimal postoperative side effects, and improve perioperative patient comfort. Furthermore, it should improve the effectiveness of work in an operating room, provide as short as possible patient hospitalization, with positive

effects on cost-effectiveness of the treatment. The principal goal of out-patient anesthesia is to provide rapid patient turnover, rapid patient discharge in absence of any side effects, minimal intrusion into patient's everyday life and reduction of the risk for infections and postoperative complications [3,4].

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**Local Anesthesia and Intravenous Analgesedation**

At the beginning of 1950s, Schneider was the first to introduce a modified local anesthesia infiltration technique, which has later gained wide acceptance in proctology [5]. The technique utilizes a curved needle for the application of hyaluronidase in order to improve tissue laxity and facilitate the infiltration of perianal tissues with a solution of local anesthetics. Postoperative patient discomfort and pain associated with the technique are thus minimized. It has been shown that the use of hyaluronidase increases the effectivity of local anesthesia in all anorectal surgical procedures.

In recent years, the availability of new sedation techniques used in combination with local anesthesia increased the number of surgical interventions performed in the conditions such as these. This technique provides very satisfactory surgical settings, patient comfort, short hospitalization periods, and cost-effectiveness compared to other techniques employed in out-patient anorectal surgery.

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Possible local complications occur usually during the application of local anesthetic and injury to the anatomical structures at the application site itself. Systemic complications tend to occur if larger concentrations of the solution of local anesthetic reach systemic circulation. Out of these, syncope, toxic reactions, hypersensitivity reactions and anaphylaxis should be mentioned. Toxic reactions are the most common of these, accounting for over 90% of reactions to local anesthetics [6].

Patient satisfaction with local anesthesia combined with intravenous analgesia is in correlation with appropriate control of postoperative pain and absence of side effects, such as urine retention, nausea and vomiting. The success depends as well on the experience and operative skills of the surgeon in the provision of effective infiltration analgesia and careful manipulation with the adjacent tissues. An extensive local infiltration of the operating field may reduce spasms of the rectal sphincters and produce better postoperative analgesia [7].

The combination of intravenous analgesia using benzodiazepines and opioids, as well as propofol, etomidate and ketamine with local anesthesia is a safe and effective technique for this type of surgery. The approach may shorten patient stay in the postoperative recovery room and enables early hospital discharge, which produces significant economic benefits [8].

### Regional Anesthesia – Neuraxial Blocks

Regional anesthesia is a valid option for single-day surgery and is associated with a lower degree of postoperative nausea and vomiting (PONV) compared with general anesthesia, and provides better postoperative analgesia as well. After the introduction of atraumatic pencil-point smaller diameter needles into clinical practice, the incidence of post-puncture headache has been reduced, and spinal anesthesia has become a valuable option for out-patient anesthesia and surgery, since it is able to provide rapid, reliable and effective blocks with a simple injection of small doses of local anesthetics into the readily accessible subarachnoid space. Except for the risk for post-puncture headache, the main problems with the use of spinal anesthesia in out-patient settings are associated with the action of the spinal block on the bladder function and recovery of motor functions after the spinal block [9]. It is therefore necessary to check the motor and sensory activity before patient discharge from the hospital. Most interventions in proctology are associated with pain. It has been proposed that appropriate analgesia could additionally improve the outcome of the surgical intervention, reducing the response of the body to surgical stress and thus the length of hospitalization. Neuraxial anesthesia (spinal and epidural) has been shown to be very effective in reducing the response of the body to surgical and metabolic stress compared to other techniques of anesthesia (Figure 1). However, in recent years, investigating the concept of single-day surgery, several studies have



**Fig. 1** Regional anesthesia- spinal anesthesia

shown that multimodal approach to analgesia in such patients improves postoperative outcomes, reduces organ function disturbances and morbidity and, consequently, shortens hospitalization.

Local anesthetics administered subarachnoidally can be hyperbaric, isobaric or hypobaric, depending on the specific weight. Isobaric solutions of local anesthetics are most commonly used. The most commonly used agents are bupivacaine, levobupivacaine, ropivacaine, lidocaine, tetracaine etc [10].

Acute urinary retention is one of the well-known complications of spinal anesthesia. However, with lower doses of local anesthetics combined with opioids more rapid recovery after the sensory and motor block can be achieved. Since the fundamental cause of postoperative urinary retention after anorectal surgery is in part associated with perineal pain, lower incidence of urinary retention can be achieved with local infiltration anesthesia in order to alleviate postoperative pain. Side effects of spinal anesthesia can prolong hospitalization and to some extent reduce patient satisfaction with the surgical treatment.

### General Anesthesia

General anesthesia is used for more extensive surgical interventions. Intravenous anesthesia (total intravenous anesthesia – TIVA, or target-controlled infusion anesthesia – TCI), inhalation anesthesia and balanced anesthesia are the types most commonly used. Although with inhalation anesthesia with sevoflurane it is easier to control the depth of anesthesia compared to TIVA, it is associated with a higher rate of PONV, especially in the cases without prophylaxis. Propofol and etomidate are the agents most commonly used for intravenous anesthesia, depending on hemodynamic stability of the patient. Rocuronium bromide, atracurium, cis-atracurium



**Fig. 2** General anesthesia-monitoring

and others are used as muscle relaxants, depending on the duration of surgical intervention [11].

Preoperative patient preparation for out-patient anorectal surgical treatment does not require extensive measures. Standard monitoring for intraoperative anesthetic monitoring of these patients usually involves electrocardiography, pulse oximetry, capnography and non-invasive blood pressure measurement (Fig. 2).

The principal side effects of general anesthesia after anorectal surgery are PONV, vertigo and pain. Although the frequency of PONV may be reduced by using modern anesthetics and antiemetics, it is still a usual side effect of general anesthesia, which prolongs hospitalization after out-patient surgery [12].

### Therapy of Pain

Analgesia in the postoperative period should provide alleviation of pain and appropriate functional activity of the patient. The contemporary treatment of postoperative pain involves a multimodal approach to analgesia, which is achieved with optimal combinations of analgesics and their lower doses in order to optimize analgesia and minimize its side effects. The choice of analgesics should

be adjusted to the surgical intervention, since the effect of individual analgesics differs with different surgical interventions. For the treatment of acute postoperative pain opioid analgesics (fentanyl, alfentanil, morphine), non-opioid analgesics (paracetamol, non-steroid anti-inflammatory agents – NSAIDs) and local anesthetics are usually used. Gabapentinoids may have a favorable impact in this multimodal approach. Further, oral or intravenous use of acetaminophen or NSAIDs may be beneficial in out-patient settings. Selective inhibitors of cyclooxygenase-2 have also been administered, but their use diminishes due to their prothrombotic effects [13].

The choice and dose of analgesics should be adjusted to the general patient status, surgical intervention, presence of comorbid conditions preoperatively, administration of opioids, and all other factors which may influence pain relief.

### Treatment of Postoperative Nausea and Vomiting

One of the principal side effects of general anesthesia is, among others, PONV, which significantly prolongs patient hospitalization and may produce patient discomfort and dissatisfaction with the surgical intervention. Prevention is therefore of utmost importance, whenever possible.

The multimodal regimen of PONV prophylaxis is based on the idea that in medium- or high-risk patients it is rather unlikely that the desired effect will be produced with the administration of a single antiemetic agent – a combination of two or three medicaments is usually recommended instead. In these efforts, we should bear in mind different mechanisms of action of antiemetic agents, as well as their possible synergy. In medium-risk patients, PONV prophylaxis usually consists of dexamethasone or metoclopramide, or their combination, while for the prophylaxis in high-risk patients the combination of an 5-HT<sub>3</sub> antagonist (the drug of choice is most commonly ondansetron) with dexamethasone and/or metoclopramide is recommended [14].

### Conclusion

The aim of anesthesia in proctology is to provide adequate analgesia, adequate conditions for the surgery, and minimization of side effects. For that purpose, local anesthesia, independent or combined with intravenous analgesia, regional anesthesia, or general anesthesia can be used. Depending on the general status of the patient and surgical intervention itself, the attending anesthesiologist will decide upon the most appropriate of the available anesthesia techniques. Recent studies favor local anesthesia combined with intravenous sedation, since it provides good operative conditions, improves patient comfort and satisfaction, while reducing side effects. The multimodal approach to perioperative analgesia represents the combination of several agents, including local anesthetics, opioids and NSAIDs.

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