Ege Journal of Medicine / Ege Tıp Dergisi 49(3): 213-216, 2010

Spinal anesthesia in gynecological laparoscopic surgery

Jinekolojik laparoskopik cerrahide spinal anestezi

Günüşen İ[1] Akdemir A[2] Karaman S[1] Yılmaz F[1] Yücebilgin S[2] Çırpan T[2]

[1]Ege Üniversitesi Tıp Fakültesi, Anesteziyoloji ve Reanimasyon Anabilim Dalı, İzmir, Türkiye
[2]Ege Üniversitesi Tıp Fakültesi, Kadın Hastalıkları ve Doğum Anabilim Dalı , İzmir, Türkiye

Summary

Laparoscopic procedures that are widely used in gynecological surgery are commonly applied under general anesthesia. However, spinal anesthesia is preferred only in patients where general anesthesia is contraindicated. The literature indicates that general surgery under spinal anesthesia in fit patients (e.g., laparoscopic cholecystectomy) is used more than gynecologic surgery. In this case report, we present the laparoscopic treatment of a patient with an ectopic pregnancy who had elevated liver enzyme levels and did not consent to general anesthesia and thus underwent spinal anesthesia.

Key words: Spinal anesthesia, gynecological laparoscopy, ectopic pregnancy.

Özet

Jinekolojik cerrahide yaygın olarak kullanılan laparoskopik girişimler, çoğunlukla genel anestezi altında uygulanır. Spinal anestezi ise, ancak genel anestezinin kontrendike olduğu hastalarda tercih edilir. Literatüre bakıldığında, sağlıklı kişilerde spinal anestezi ile laparoskopik girişimlerin genel cerrahi vakalarında (ör:laparoskopik kolesistektomi) jinekolojik cerrahiye göre daha çok kullanıldığı görülür. Bu olgu sunumunda, genel anesteziyi kabul etmeyen, karaciğer enzimleri yüksek, ektopik gebelik tanılı bir hastanın spinal anestezi altındaki laparoskopik tedavisi sunulmuştur.

Anahtar kelimeler: *Spinal anestezi, jinekolojik laparoskopi, ektopik gebelik.*

Introduction

Many surgical gynecological procedures are successfully performed laparoscopically, and some of these (e.g., tuba-ovarian pathologies and ectopic pregnancy) have dominated as the new “gold standard” for diagnosis and treatment (1). Laparoscopic surgery includes postoperative advantages of less pain, fewer pulmonary complications, short hospital stay, early return to daily activities and low cost (2).

Yazışma Adresi: İlkben GÜNÜŞEN
Ege Üniversitesi Tıp Fakültesi Anesteziyoloji ve Reanimasyon Anabilim Dalı -İZMİR

Makalenin Geliş Tarihi: 12.10.2009 Kabul Tarihi: 20.11.2009

Many anesthesiologists and surgeons frequently prefer general anesthesia for the reason that it allows control of airways and ventilation and promotes muscular relaxation and prevents aspiration during laparoscopic surgery. Another reason for this popularity is that patients who are awake during such procedures do not tolerate the adverse effects from the pneumoperitoneum well (2,3). However, some centers have been using spinal anesthesia as their first preference in laparoscopic surgery for a long time (3). The literature shows that spinal anesthesia is usually used in laparoscopic abdominal surgery, which includes cholecystectomy, diagnostic laparoscopy and appendectomy (4). Some small series discussed spinal anesthesia as the sole anesthetic procedure in gynecological laparoscopic

surgery (3). However, a few studies investigated the safety and efficacy of spinal anesthesia for gynecological laparoscopic surgery in the literature (1,5-8). We present the laparoscopic treatment of a patient with elevated liver enzyme levels who did not consent to general anesthesia thus underwent spinal anesthesia in this study.

Case Report

A 29-year-old, 90 kg, gravida 1, para 0 woman with chronic hepatitis B virus infection and lower abdominal pain was presented to our clinic. She had been experiencing minimal vaginal bleeding for the previous seven days. Gynecologic ultrasound revealed no intrauterine gestation, but noted a left adnexial ecojenity measuring 1×2 cm. Serum blood samples were in the normal range except for serum aspartate aminotrasferase: 128 UL (normal range ≤35 UL), serum alanine aminotransferase: 180 UL (normal range ≤40 UL) and beta-human chorionic gonodotropin: 2152 MIU mL.

After the patient gave her written informed consent, intravenous catheterization was done with a 16-gauge (G) cannula inserted into a peripheral vein; and then 900 mL Ringer's Lactate solution (10 mL kg^{-1}) was infused. No premedication was given. In the operating room, the patient's heart rate (HR), blood pressure (systolic, diastolic and mean arterial blood pressure), and oxygen saturation were monitored by electrocardiograph, non-invasive blood pressure monitor and pulse oximeter (Datex-Ohmeda, Helsinki, Finland). Spinal anesthesia was administered in the sitting position using a 26 G Atraucan spinal needle (B. Braun Melsungen, Germany) at the L3-4 interspace. A combination of 2 ml of 0.5% hyperbaric bupivacaine (Marcaine heavy 0.5%, AstraZeneca, England) and 0.5 ml of fentanyl (i.e., 25 µg) was administered into the subarachnoid space, after which the patient was repositioned in the supine position. As soon as the sensory block reached T5 dermatome, the patient was placed into the dorsal lithotomy position. The hemodynamic variables were within normal ranges before the incision. The surgical procedure began 15 minutes after the spinal anesthesia. A sagittal incision was made below the umbilicus and a Veress needle was inserted into the peritoneum. The pneumoperitoneum was created with CO_2 (4L min^{-1}) at a maximum intra-abdominal pressure of 10 mm Hg, instead of the usual 14 mmHg. A 10-mm trocar was introduced at the umbilical level. After two 5-mm trocars were inserted at the bilateral lower abdominal quadrants, the patient was placed into a 10° reverse trendelenburg position. Although the uterus and bilateral ovaries were obviously normal, an unruptured ectopic gestation was noted in the left tuba. Left linear salpingostomy was performed laparoscopically. During the operation the intraabdominal pressure was kept between 8 and 10 mmHg. Because of the patient's obesity, intraabdominal pressure had to be altered to 13 mmHg and the trendelenburg position had to be increased to 20° at the 10^{th} minute. At that time the patient complained of a pain which started in her right shoulder and subsequently spread to her other shoulder. Her anxiety and abdominal and shoulder discomfort were treated with 2 mg of midazolam bolus and 100 mg of tramadol in 100 mL normal saline solution infused slowly in an intravenous, respectively. The pain and anxiety disappeared after this treatment. Throughout the entire surgical procedure, all vital variables were within normal ranges (heart rate, arterial blood pressure, and peripheral oxygen saturation), and the patient showed no signs of hypotension or bradycardia. The whole operation took 30 minutes and no vasopressor drug was required. In the second post-operative hour, the motor block resolved. Postoperative pain score was evaluated with the visual analogue scale (from 0 to 10 with 0- no pain and 10- worst pain) and postoperative pain was treated with diclofenac sodium (50 mg, i.m.) when the patient had a VAS (visual analogue scale) score ≥ 4 cm. She was discharged in good condition on the third post-operative day.

Discussion

Regional anesthesia in laparoscopic surgery offers several advantages compared to general anesthesia: quicker recovery, decreased nausea/vomiting, less postoperative pain, shorter post-operative stay, improved patient satisfaction, better overall safety and fewer hemodynamic changes. The potential disadvantages, which include shoulder pain secondary to diaphragmatic irritation and discomfort and anxiety secondary to abdominal distension, are incompletely alleviated using regional anesthesia (3,4,9,10). Laparoscopic surgery using regional anesthesia often needs supplementation with intravenous sedation and an analgesic because of increased anxiety, pain and discomfort. The effect of combined pneumoperitoneum and sedation can lead to hypoventilation and arterial oxygen desaturation. One of the most important problems with laparoscopic surgery under spinal anesthesia is inadequate relaxation of abdominal musculature and this rarely requires conversion to general anesthesia (3,9). In laparoscopic cholecystectomy where spinal anesthesia is preferred more, patients suffer less from pain and anxiety

depending on the patient position (fowler position). In gynecological procedures, however, spinal anesthesia is chosen less due to the increase in shoulder and neck pain related to trendelenburg position (3,10). Minai et al. (5) studied a woman with heterotrophic pregnancy who was scheduled for laparoscopic surgery. The surgery was performed under spinal anesthesia while the patient remained awake, with a pneumoperitoneal pressure of 6 mmHg. Bilateral shoulder pain arose when the pneumoperitoneal pressure increased to 8 mmHg; but this pain disappeared after the pneumoperitoneal pressure decreased to 6 mmHg. Attention was paid to shoulder pain that arose from the physical and chemical stimulation of the diaphragm by the pneumoperitoneum. In our patient, shoulder pain was not seen when intraabdominal pressure was 8 mmHg. However, her shoulder pain started as soon as intraabdominal pressure was altered to 13 mmHg and the trendelenburg position was increased. In laparoscopic surgery with spinal anesthesia, it was shown that premedication and sedatives and analgesic drugs used in the intraoperative period were also effective. In studies, midazolam, propofol and ketamine were often suggested for sedation and analgesia (3,6,11). We used midazolam and tramadol in this patient, and obtained enough sedation and analgesia. In addition, the local anesthetic dose was used in spinal anesthesia and the addition of opioid and the volume used in spinal anesthesia were very important for the patient and surgeon satisfaction. Wang et al. (7) showed that intrathecal sufentanil dose-dependently altered the effects of bupivacaine spinal anesthesia, and larger sufentanil doses produced better effects. In addition, the requirement for propofol was significantly less in this group. As a result Wang et al. found that the optimal dose for gynecologic laparoscopic surgery was 15 mg of bupivacaine with 5.0 μg sufentanil. A large study that included 4645 patients who underwent different laparoscopic surgery under spinal anesthesia examined patients who were premedicated with 0.2 mg of glycopyrrolate, 10 mg of diazepam (or 5 mg of midazolam) or 3 mL (25 mg mL) intramuscular diclofenac sodium (3). In patients complaining of neck or shoulder pain, or both, 25 mg of tramadol was administered as a slow IV or in a drip. In patients who still had persistent pain, 25 mg of ketamine was administered as a slow IV. If the patient was still anxious, conversion to general anesthesia was done. The intraperitoneal pressure was kept between 8 and 10 mm Hg. Of these patients, 571 (12.29%) experienced neck or shoulder pain. Intravenous tramadol was required by 2996 patients (64.5%), and ketamine had to be given to 567 (12.21%) patients. Ten (0.21%) patients required conversion because of anxiety, despite sedation. Conversion to general anesthesia was also required in four patients in whom the effect of spinal anesthesia failed. Our patient suffered from shoulder and neck pain when the intraabdominal pressure was increased to 13 mmHg and her pain was relieved with midazolam 2 mg IV and tramadol 100 mg IV.

The most common side effect of spinal anesthesia is hypotension related to liver perfusion disorder. It has been reported that hepatic blood flow decreased during high spinal and epidural anesthesia and appeared to mirror simultaneous reductions in systemic arterial blood pressure (12). However, hypotension can be prevented when recognized early and treated promptly. Since our patient was administered a fluid preload pre-surgery and monitorized during the surgical procedure, no signs of hypotension were observed. If she had concented to general anesthesia, it could have been administered instead of spinal anesthesia. However, volatile agents may have adverse effects on various body systems. Although most of these effects are minimal and reversible, fatal complications such as fulminan hepatitis may occasionally occur (13). Administration of either sevoflurane or desflurane and not undergoing surgery produced no significant abnormalities in liver function test results (12). Yet, in some reports, hepatotoxicity, even with new volatile agents, (desflurane, sevoflurane) was discussed (14-16). Prolonged administration of volatile anesthetics may be a risk factor for hepatic damage (13). Propofol, which is a commonly preferred drug for total intravenous anesthesia (TIVA), has been reported to increase total hepatic blood flow, primarily by increasing hepatic portal venous flow (17). As a result, TIVA seems to be a better preference than volatile anesthetics in these patients.

In conclusion, spinal anesthesia may be a safe and effective technique for short gynecological laparoscopic provided that the patient is not put into the extreme trendelenburg position, the anesthesia is supported with sedative and analgesic drugs and abdominal pressure is kept between 8 and 10 mmHg. The length of surgery and the surgeon's experience are also important factors. This is the first case report in which we experienced a patient with an ectopic pregnancy who underwent laparoscopic surgery with spinal anesthesia. However, future studies with a large series are needed to determine the place of spinal anesthesia in laparoscopic gynecological surgery.

Kaynaklar

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