

# Raquianestesia Contínua em Paciente Submetido à Gastrectomia Parcial. Relato de Caso \*

## Continuous Spinal Block in a Patient Undergoing Partial Gastrectomy. Case Report

Patrícia Falcão Pitombo <sup>1</sup>, Robson Moura <sup>2</sup>, Ricardo Miranda <sup>3</sup>

### RESUMO:

Pitombo PF, Moura R, Miranda R - Raquianestesia Contínua em Paciente Submetido à Gastrectomia Parcial. Relato de Caso.

**JUSTIFICATIVA E OBJETIVOS:** Devido à alta incidência de complicações técnicas e neurológicas, a raquianestesia contínua foi abandonada por muitos anos. Com o surgimento dos cateteres intermediários, a técnica vem ressurgindo e ganhando simpatia no arsenal anestesiológico. O objetivo deste relato foi resgatar a utilidade da técnica como alternativa viável para procedimento de médio a grande porte.

**RELATO DO CASO:** Paciente feminina, 58 anos, 62 kg, estado físico ASA I, com relato de enxaqueca, lombalgia e procedimentos cirúrgicos prévios sob raquianestesia sem intercorrências. Candidata à laparotomia exploradora por provável tumor pélvico. Após venoclise com cateter 18G, monitorização com cardioscópio, pressão arterial-não invasiva e oximetria de pulso, foi sedada com midazolam 2 mg e fentanil 100 µg e colocada em decúbito lateral esquerdo. Foi submetida à raquianestesia contínua por via mediana em L<sub>3</sub>-L<sub>4</sub>. Foram injetados 9 mg de bupivacaína hiperbárica a 0,5% e 120 µg de sulfato de morfina. Após inspeção da cavidade, verificou-se que o tumor era proveniente do estroma gástrico, sendo necessária ampliação da incisão e realização de gastrectomia parcial. Todo o procedimento foi realizado com pequena dose de solução hiperbárica e completa estabilidade hemodinâmica. Não houve necessidade de UTI no pós-operatório e a paciente evoluiu sem queixas e com alto grau de satisfação. Recebeu alta hospitalar após 72 horas sem nenhuma intercorrência.

**CONCLUSÕES:** Os cateteres intermediários utilizados em raquianestesia contínua mostram-se promissores em tornar a técnica bastante atraente e de grande utilidade em operações de médio a grande porte, podendo inclusive ser alternativa eficaz no manejo de pacientes em estado crítico, em que grandes repercussões hemodinâmicas podem ser deletérias.

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### SUMMARY

Pitombo PF, Moura R, Miranda R – Continuous Spinal Block in a Patient Undergoing Partial Gastrectomy. Case Report.

**BACKGROUND AND OBJECTIVES:** Due to the high incidence of technical and neurological complications, continuous spinal blocks were not performed for several years. With the advent of intermediate catheters the technique has been used more often and gaining acceptance among anesthesiologists. The objective of this report was to demonstrate the usefulness of the technique as a viable alternative for medium and major size surgeries.

**CASE REPORT:** This is a 58 years old female patient, weighing 62 kg, physical status ASA I, with a history of migraines, low back pain, and prior surgeries under spinal block without intercurrentence. The patient was scheduled for exploratory laparotomy for a probable pelvic tumor. After venoclysis with an 18G catheter, monitoring with cardiocscope, non-invasive blood pressure and pulse oximetry was instituted; she was sedated with 2 mg of midazolam and 100 µg of fentanyl, and placed in left lateral decubitus. The patient underwent continuous spinal block through the median approach in L<sub>3</sub>-L<sub>4</sub>; 9 mg of 0.5% hyperbaric bupivacaine and 120 µg of morphine sulfate were administered. Inspection of the abdominal cavity revealed a gastric stromal tumor that required an increase in the incision for a partial gastrectomy. A small dose of hyperbaric solution was required for the entire procedure, which was associated with complete hemodynamic stability. Postoperative admission to the ICU was not necessary; the patient presented a good evolution without complaints and with a high degree of satisfaction. She was discharged from the hospital after 72 hours without intercurrentence.

**CONCLUSIONS:** Intermediate catheters used in continuous spinal blocks have shown the potential to turn it an attractive and useful technique in medium and large size surgeries and it can even be an effective alternative in the management of critical patients to whom hemodynamic repercussions can be harmful.

**Keywords:** ANESTHETIC TECHNIQUES, Regional: subarachnoid; SURGERY, Abdominal: gastrectomy

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***Continuous Spinal Block in a Patient Undergoing Partial Gastrectomy. Case Report***

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**INTRODUCTION**

Continuous spinal block is a promising technique; its main advantages include maintenance of optimal surgical conditions and complete cardiorespiratory stability with low doses of local anesthetics. Although it is an old technique, the use of inadequate material, technical complications during insertion and management, and the high incidence of neurological complications were responsible for the discontinuation of its use <sup>1</sup>. With the recent development of intermediate catheters (an over-the-needle catheter) associated

with a low incidence of headache and neurological symptoms <sup>2</sup>, the credibility of the technique has increased.

The objective of this report was to demonstrate its effectivity and safety, which make it a viable alternative for different surgical procedures including upper abdominal surgeries.

## CASE REPORT

This is a 58 years old female, weighing 62 kg, physical status ASA I, with a history of migraines and low back pain who underwent tubal ligation and hysterectomy under spinal block without intercurrent. The patient was scheduled for an exploratory laparotomy for a pelvic tumor. After venoclysis with an 18 G catheter, monitoring with cardioscope, non-invasive blood pressure and pulse oximetry was instituted. The patient was placed in left lateral decubitus for the continuous spinal block. She was sedated with 2 mg of midazolam and 100 µg of fentanyl. The L<sub>3</sub>-L<sub>4</sub> space was punctured with a set of 27G Quincke needle and 22G catheter (Spinocath® B. Braun Melsugen AG), according to the technique described previously <sup>3</sup>. After insertion of the catheter, the patient was placed in dorsal decubitus and 9 mg of 0.5% hyperbaric bupivacaine and 120 µg of morphine sulfate were administered, followed by Trendelenburg at 45°. After 20 minutes the sensorial level had reached T<sub>3</sub> and the motor blockade of the lower limbs was classified as grade 2 by the Bromage scale <sup>4</sup>. A urinary catheter was also inserted. After median infraumbilical incision with excellent relaxation and analgesia the pelvic cavity was inspected revealing the presence of a large tumor that, after further examination, was detected as originating from the gastric stroma (GIST- Gastric Intestinal Stromal Tumor). The surgical incision was extended until the xiphoid process; the patient remained oriented and without complaints of discomfort. During removal of the tumor, the patient developed nausea followed by vomiting of a small volume; 8 mg of ondansetron were administered and a short pause in the manipulation was requested to the surgeon. A number 18 nasogastric tube was inserted with total patient collaboration. When suture of the anatomical planes started, the patient complained of mild pain and 5 mg of 0.5% hyperbaric bupivacaine were administered through the catheter with immediate pain relief. The surgery lasted one hour and 35 minutes. At the end of the surgery, 2 g of intravenous dypirone were administered. At the end of the procedure the sensorial level was at T<sub>11</sub> and the motor blockade had a Bromage scale grade 2; the subarachnoid catheter was removed at this point. Postoperative analgesia consisted of the intravenous administration of 1 g of dypirone every six hours, 100 mg of ketoprofen every eight hours, and 3 mg of morphine sulfate every four hours. In the post-anesthetic care unit (PACU) the patient remained pain free, without any degree of motor blockade, and under total cardiorespiratory stability.

The patient was pain free in the postoperative period, with a high degree of satisfaction, and she was discharged from the hospital 72 hours after the surgery.

## DISCUSSION

Continuous spinal block is a technique in which the local anesthetic can be administered continuously (infusion pump) or intermittently in the subarachnoid space through a catheter. It was first described in 1907 by a British surgeon who recommended puncture of the subarachnoid space, maintaining the needle *in situ* to facilitate further administration of the local anesthetic. This method stopped being used because of the high incidence of neural traumas and breakage of the needle in the puncture site. In 1944, Touhy defended the use of the number 4 rubber urinary catheter, introducing it in the subarachnoid space through a 15G needle. In 1950 after a large comparative study Dripps detected a high incidence of failures, local trauma, technical problems, headache, neurological sequelae, and catheter breakage. This study was responsible for the discontinuation of the technique all over the world. Further studies were undertaken and, recently, intermediate catheters (over-the-needle catheter) were introduced as a great promise to solve the main problems of macro- and microcatheters. Since they are outside the needle, the dura mater orifice is completely obstructed by the catheter, preventing the loss of CSF and poor distribution of the anesthetic agent <sup>5</sup>.

The case presented here was a good indication for the technique because, besides attenuating the endocrine-metabolic response to trauma, it reduced the cardiac load, the incidence of deep venous thrombosis and pulmonary complications, and it allowed the preferential blockade of the dorsal roots (sensorial), since a low dose of the anesthetic was administered after placing the patient in the dorsal decubitus. The downward inclination of the head by 45° was used to reach a sensorial level at T<sub>4</sub> (peritoneal innervation), achieved with the solution used (hyperbaric) since its dislocation in the CSF is a function of the intraoperative position of the patient in the first 20 minutes after administration. Gessel et al., in a comparative study, concluded that in young patients the administration of isobaric solution requires high doses to reach an adequate level (they reached a maximal sensitive level of T<sub>11</sub> and sympathetic level of T<sub>9</sub>) with moderate reduction in mean arterial pressure but a high failure rate. They also stated that in the supine horizontal position the highest level is L<sub>3</sub> and from there on the subarachnoid space inclines downward and cephalad, which helps to understand the poor cranial dispersion of hypobaric solutions (L<sub>1</sub> was the highest sensorial level achieved, while the sympathetic level was T<sub>11</sub>). Hyperbaric solution in this same situation has higher cephalad dispersion and more adequate sensorial level (T<sub>4</sub> was the maximal sensitive and sympathetic levels achieved), but with higher hemodynamic changes and therefore the dose should be titrated <sup>6</sup>. Since

the present case required extensive blockade in the upper abdomen, continuous spinal block with this solution was indicated.

Besides, it is known that even though the dorsal roots (sensitive) are bigger (which in theory would hinder anesthetic penetration) than the ventral roots (motor), they are separated in bundles. This creates a wider surface for anesthetic penetration than in the motor fibers, explaining the relative ease of the sensitive blockade in relation to the motor blockade <sup>7</sup>.

It is known that high spinal block can have negative hemodynamic implications. Extensive sympathetic blockade can lead to a reduction in heart rate, preload (cardiac output), right atrial end-diastolic pressure, and afterload (TPVR). However, the reduction in TPVR attenuates the reduction in cardiac output preventing a higher imbalance between pre- and afterload, explaining the mild reduction in cardiac output in cases of high spinal block despite a reduction in venous return. Thus, an imprecise correlation between hypotension and extension of the sympathetic blockade can be observed <sup>5</sup>.

Critchley et al. <sup>8</sup> identified three predictive factors of hypotension in subarachnoid blocks: a) age equal or higher than 45 years; b) female gender; and c) sensitive blockade above T<sub>7</sub>. Regarding age, several factors are responsible for the greater tendency for hypotension in the elderly, such as a decrease in body water content and decreased adaptation of the cardiovascular system to posture and volume changes. In another study <sup>9</sup>, it was observed that female patients had 8.81 times greater probability to develop hypotension than males. Sensitive blockade above T<sub>7</sub> was associated with a 13 times greater probability of hypotension, indicating that the extension of the sympathetic blockade is the stronger factor associated with cardiovascular changes in subarachnoid block. All those factors contribute to make continuous spinal block a better technique than single-dose spinal block, combined spinal-epidural anesthesia, or continuous epidural, which require higher doses, produce complete motor blockade and whose cardiocirculatory effects are more evident.

Imbelloni and Beato <sup>10</sup> showed that the level of analgesia in continuous subarachnoid block compared to simple subarachnoid or combined spinal-epidural anesthesia assumed a dissociative character, staying two segments below the single-dose spinal block and four segments below the spinal-epidural anesthesia, corroborating the greater stability of continuous spinal block. Besides, mortality was also reduced to half when compared to simple spinal block or combined spinal-epidural anesthesia <sup>10</sup>.

In the case presented here, bradycardia, hypotension, or the need for aggressive volume replacement were not observed because a low dose of anesthetic was used, and its dilution in the CSF and preferential blockade of sensorial fibers maintained cardiocirculatory stability. Volume replacement was limited to insensible losses and intraoperative bleed-

ing. However, a relatively fast descendent curve of the sensitive blockade was observed, which might have been influenced by the low dose of the anesthetic associated with the low puncture level. The quality of surgical relaxation was excellent (evaluated clinically by the surgeon and by the intestinal contraction), which facilitated tremendously the surgical work, avoided the use of general anesthesia, reduced hospital costs, decreased recovery time, and led to an early hospital discharge. On the other hand, the episode of nausea and vomiting can be explained by the manipulation of the tumor and by the fact that, during the subarachnoid block, the gastrointestinal tract is under parasympathetic influence (because the vagus nerve emerges high in the brain stem), with an increase in the incidence of nausea and vomiting of up to 20%. The delay in gastric emptying caused by the use of opioids (morphine) could also have contributed for the episode <sup>5</sup>.

The relevance of the present study relies in the fact that it demonstrated a technique rarely described that enriches the national literature. Regarding upper abdominal surgeries, spinal block is not frequently used. Under the conditions described, the technique is feasible and satisfactory for medium and large size surgeries, with excellent cardiocirculatory stability and few adverse events; however, further studies with a larger study population are necessary to prove its efficacy.

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**RESUMEN:** Pitombo PF, Moura R, Miranda R - Raquianestesia Continua en Paciente Sometido a la Gastrectomía Parcial: Relato de Caso.

**JUSTIFICATIVA Y OBJETIVOS:** *A causa de la elevada incidencia de las complicaciones técnicas y neurológicas, la raquianestesia continua fue abandonada durante muchos años. Con el surgimiento de los catéteres intermediarios, la técnica ha venido evolucionando nuevamente y obteniendo la simpatía en el arsenal anestesiológico. El objetivo de este relato, fue rescatar la utilidad de la técnica como una alternativa viable para el procedimiento de medio y gran porte.*

**RELATO DEL CASO:** *Paciente femenina, 58 años, 62 kg, estado físico ASA I, con relato de jaqueca, lumbago y procedimientos quirúrgicos previos, bajo raquianestesia sin interurrencias. Candidata a laparotomía exploradora por un probable tumor pélvico. Después de efectuada la venoclisis con catéter 18G, monitorización con cardioscopio, presión arterial no invasiva, y la*

*oximetría de pulso, se le sedó con midazolam 2 mg y fentanil 100 µg y se le puso en decúbito lateral izquierdo. Se le sometió a la raquianestesia continua por vía mediana en L<sub>3</sub>-L<sub>4</sub>. Se le inyectaron 9 mg bupivacaína hiperbárica a 0,5% y 120 µg de sulfato de morfina. Después de la inspección de la cavidad, se verificó que el tumor era proveniente del estroma gástrico, siendo necesaria la ampliación de la incisión y la realización de gastrectomía parcial. Todo el procedimiento fue realizado con una pequeña dosis de solución hiperbárica y una completa estabilidad hemodinámica. No hubo necesidad de UCI en el postoperatorio y la paciente evolucionó sin quejarse y con un alto grado de satisfacción. Recibió el alta después de 72 horas sin ningún problema.*

**CONCLUSIONES:** *Los catéteres intermediarios utilizados en la raquianestesia continua parecen ser promisorios en hacer con que la técnica sea bastante atractiva y de gran utilidad en operaciones de medio y gran porte, y puede incluso ser una alternativa eficaz en el manejo de pacientes en estado crítico, donde las grandes repercusiones hemodinámicas pueden ser perjudiciales.*