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Perioperative management of a patient with primary aldosteronism submitted to laparoscopic adrenalectomy. Case report and brief literature review.

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Abstract:
Primary aldosteronism (PA) can be a rare cause of systemic arterial hypertension associated with hypo or normocalemia, hyperaldosteronemia and hyporeninemia. The perioperative management of PA has two main focuses: control of hypokalemia and arterial blood pressure. Here we report a case of a female, 32 years old, diagnosed with primary aldosteronism after repeated hypertensive crises despite antihypertensive therapy. This case reminds us that potassium levels and arterial blood pressure should be carefully managed in the preoperative period, thus reducing potentially life-threatening complications such as hypo, hyperkalaemia, severe hypotension and hypertensive crises.

Key Words: *Primary Aldosteronism; Perioperative Management; Laparoscopic Adrenalectomy*

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I. Introduction

Primary aldosteronism (PA) can be a rare cause of systemic arterial hypertension associated with hypo or normocalemia, hyperaldosteronemia and hyporeninemia, often caused by aldosterone-producing adenoma or adrenal hyperplasia[1]. This report presents the perioperative management of a patient with PA submitted to unilateral laparoscopic adrenalectomy.

II. Case Report

Female, 32 years old, 60 kg, diagnosed with primary aldosteronism after repeated hypertensive crises despite antihypertensive therapy. Clinical investigation revealed hormone dysfunction compatible with PA and tomographic findings revealed a nodule measuring 3.5 x 2.8 cm in the left adrenal gland. Drug therapy was instituted with the association of amlodipine 10mg/day, losartan 100mg/day and spironolactone 200mg/day, obtaining satisfactory blood pressure control. Due to chronic hypokalemia (serum potassium 1.9 mEq/L), parenteral replacement was performed days before surgery in addition to the introduction of the potassium-sparing diuretic. At the surgery date, in the operating room, with preoperative tests within normal limits and standard monitoring, she was anxious, with arterial blood pressure 150x100mmHg, heart rate 90 beats per minute. Intravenous 2mg midazolam was administered, decreasing blood pressure and heart rate. Intravenous anesthetic induction was performed with 0.3 $\mu g.Kg^{-1}$ remifentanil hydrochloride, 2 $mg.Kg^{-1}$ propofol, 1 $mg.Kg^{-1}$ lidocaine hydrochloride, 0.5 $mg.kg^{-1}$ rocuronium bromide followed by tracheal intubation. Then, catheterization of the right radial artery, right internal jugular vein was performed. Anesthesia was maintained with O_2, compressed air, sevoflurane (1-2%) and remifentanil hydrochloride 0.1 to 0.3 $\mu g.Kg^{-1}.min^{-1}$, with volume-controlled ventilation. After the introduction of trocars, IV infusion of 0.5 $\mu g.Kg^{-1}.h^{-1}$ dexmedetomidine and 2% lidocaine hydrochloride 1.0 $mg.kg^{-1}.h^{-1}$ was started, and maintained until the end of the surgery which lasted 2 hours and 30 minutes. The surgery was uneventful, arterial blood gas analysis and potassium levels were measured every 60 minutes. At the end of the procedure, the lumbar square plane was blocked with 0.5% ropivacaine hydrochloride 20 ml guided by ultrasound. Intraoperatively, 150 $\mu g.Kg^{-1}$ of dexamethasone, dipyrone 30 $mg.Kg^{-1}$ and ondansetron 100 $\mu g.Kg^{-1}$ were also administered IV. At the end of the surgery, after reversing the muscle relaxation, guided by TOF, the patient was extubated and sent to the ICU, where she was discharged early. 48 hours after the surgical procedure, she was discharged from the hospital, keeping up with the Endocrinology team.

III. Discussion

The perioperative management of PA has two main focuses: control of hypokalemia and arterial blood pressure. According to a study by Choi a continuous drop in serum potassium levels was observed during the intraoperative period of laparoscopic adrenalectomies for primary aldosteronism[2]. Hypokalemia may be further aggravated by respiratory alkalosis and sevoflurane-induced polyuria, therefore suggesting intraoperative potassium replacement in order to avoid hypokalemic events. Blood pressure control is delicate because the association of antihypertensives and anesthetics can precipitate hypotension. In addition, the possibility of bleeding must be remembered since is the most common complication of laparoscopic adrenalectomy, consisting about 40% of complications[3]. In contrast, , as reported by Gockel et all[4,] even after complete control of preoperative blood pressure, hypertensive crises can occur due to pneumo-inflation of carbon dioxide leading to adrenergic activation and also by adrenal manipulation[5]; therefore, large venous access and invasive blood pressure are indicated for assisting in both diagnosis and volume replacement.

The expected postoperative complications include hypotension, hyperkalaemia, hypoaldosteronism and persistent hypertension (not observed in our case), requiring the adjustment of antihypertensive therapy and the withdrawal of spironolactone, as well as potassium supplementation. Postoperative fluid therapy should be performed with normal saline solution, without potassium, except when serum potassium levels are below 3 mEq/L[6].

Therefore, we conclude that the perioperative management of patients with PA should be conducted according to their clinical context with mutual cooperation from a multidisciplinary team.

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