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## Spinal anesthesia and peripheral block for the cocaine abusing patient. Is it safe? - A Case Report

### CASE STUDY

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### ABSTRACT

The increasing use and abuse of cocaine in Brazil is an issue of great national and international concern. As anesthesiologists taking care of patients with cocaine abuse we have to be aware of the implications of substance abuse on anesthetic management. We report two cases of men with chronic cocaine use, 31 hours and 10 hours after nasal cocaine use, submitted to spinal anesthesia for lower limb orthopedic surgery and peripheral nerve block for postoperative analgesia without any complications during the procedure, PACU and the ward. Both patients were discharged 24 hours after the procedure without pain, after anterior lumbar plexus block and the lateral combined femoral-sciatic nerve block.

**KEYWORDS** : Addiction; Cocaine; Orthopedic Trauma; Regional intrathecal anesthesia; Regional peripheral lumbar plexus block.

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## I. INTRODUCTION

Substance abuse is increasing world-wide and has spread its evil tentacles in every continent. Drug abuse has a huge impact in the perioperative care of any addicted patient. Cocaine exerts its effects in several receptors and by several mechanisms, and it is difficult to predict how it will interact with drugs that act on the central nervous system and cardiovascular system. If there is chronic cocaine abuse cocaine, free interval of at least 1 week before elective surgery is recommended [1],[2]. Patients with a normal ECG and without clinical signs of cocaine toxicity may proceed safely with surgery.

In order to change the conduct routine in patients using cocaine, we report two cases of men with chronic cocaine use, 31 hours and 10 hours after nasal cocaine use, without clinical signs of intoxication, submitted to spinal anesthesia for lower limb orthopedic surgery and peripheral nerve block for postoperative analgesia.

## II. CASE REPORT - 1

After written consent for publication and signing the informed consent, a 29-year-old male (height 1.70 m, weight 60 kg, ASA I), was admitted for treatment of tibial plateau fracture Schatzeker I in dorsal decubitus position. Tests revealed all electrolytes normal. Bilirubin, urea, creatinine unchanged. The blood examination revealed: red blood cells (4,800,000/mm<sup>3</sup>), hemoglobin (14.3 g/dL) and hematocrit (41.1%). Partial thromboplastin time activates 27 seconds, prothrombin time 18.5 seconds and prothrombinic activity 84.7%. Platelet count revealed 162,000/mm<sup>3</sup>. Chest X-ray and ECG were normal.

Before induction of spinal anesthesia, routine monitoring (electrocardiogram, pulse oximetry, and noninvasive blood pressure measurement) was started and an intravenous line was placed (extracath 20G). Vital signs at arrival in the operating room were: BP 110/60 mmHg, HR 74 bpm and oxygen saturation 98% in room air, and immediately placed nasal catheter 2 L/min.

After sedation with midazolam (1 mg) and fentanyl (60 µg) intravenously and cleaning the skin with 0.5% alcoholic chlorhexidine spinal puncture was performed with the patient in the sitting position, by the median line in the L<sub>3</sub>-L<sub>4</sub> interspaces using 27 G Quincke needle. After appearance of cerebrospinal fluid (CSF) 12.5 mg of 0.5% hyperbaric bupivacaine (Cristália Produtos Químicos e Farmacêuticos Ltda) were administered at a speed of 1.5 mL/15s, obtaining sensory level at T<sub>9</sub> (pinprick test) and motor block grade 3 of limbs. The operation lasted 70 minutes without hypotension, bradycardia or decreased

oxygen saturation. After the end of surgery, in the position of dorsal decubitus, inguinal lumbar plexus block with neurostimulator (HNS12) and needle A50 and after quadriceps muscle contraction was injected 40 mL of 0.25% bupivacaine without epinephrine for postoperative analgesia. At the blocking, the patient underwent surgical table to the unaided stretcher. It remained in the PACU for 60 minutes until the completion of sensitive blockade, having been to the ward, after received 200 mL of supplement (Fresubin Jucy®).

Patient remained pain free until the morning of the following day (20 hours after) without any complaints of pain and need of analgesic for pain control, and having been discharged from the hospital on the morning of the first postoperative day. The patient was followed by telephone for three days without any complaints.

## III. CASE REPORT - 2

After written consent for publication and signing the informed consent, a 27-year-old male (height 1.80 m, weight 70 kg, ASA I), was admitted for treatment of femur and tibia fracture in dorsal decubitus position. Tests revealed all electrolytes normal. Bilirubin, urea, creatinine unchanged. The blood examination revealed: red blood cells (4,600,000/mm<sup>3</sup>), hemoglobin (13.3 g/dL) and hematocrit (42%). Partial thromboplastin time activates 30 seconds, prothrombin time 19 seconds and prothrombinic activity 85%. Platelet count revealed 172,000/mm<sup>3</sup>. Chest X-ray and ECG were normal.

Before induction of spinal anesthesia, routine monitoring (electrocardiogram, pulse oximetry, and noninvasive blood pressure measurement) was started and an intravenous line was placed (extracath 20G). Vital signs at arrival in the operating room were: BP 107/59 mmHg, HR 70 bpm and oxygen saturation 97% in room air, and immediately placed nasal catheter 2 L/min.

After sedation with midazolam (1 mg) and fentanyl (70 µg) intravenously and cleaning the skin with 0.5% alcoholic chlorhexidine spinal puncture was performed with the patient in the sitting position, by the median line in the L<sub>3</sub>-L<sub>4</sub> interspaces using 27 G Quincke needle. After appearance of cerebrospinal fluid (CSF) 17 mg of 0.5% isobaric bupivacaine (Cristália Produtos Químicos e Farmacêuticos Ltda) were administered at a speed of 1.5 mL/15s, obtaining sensory level at T<sub>12</sub> (pinprick test) and motor block grade 3 of limbs. The operation lasted 2:20 hours without hypotension, bradycardia or decreased oxygen saturation. After the end of surgery, in the position of dorsal decubitus, a lateral combined femoral-sciatic nerve approach via a single skin puncture block with neurostimulator [3] and needle

A150 and after quadriceps muscle and patella contraction was injected 20 mL of 0.25% bupivacaine without epinephrine for postoperative analgesia. Afterwards, the needle was removed until the subcutaneous tissue and redirected posteriorly and caudally to reach the sciatic nerve, identified by stimulation of the common fibular nerve or tibial nerve, confirmed by movements of the foot; then, 40 mL the same anesthetic solution was injected. At the blocking, the patient underwent surgical table to the unaided stretcher. It remained in the PACU for 60 minutes until the completion of sensitive blockade, having been to the ward, after received 200 mL of supplement (Fresubin Jucy®).

Patient remained pain free until the morning of the following day (24 hours after) without any complaints of pain and need of analgesic for pain control, and having been discharged from the hospital on the morning of the first postoperative day. The patient was followed by telephone for three days without any complaints.

#### IV. DISCUSSION

Traditionally, procedures on patients presenting for elective surgery who were found to be recent users of cocaine (by history or presence of urine cocaine metabolites) were cancelled and deferred until the patient had no evidence of recent use, for fear of myocardial ischemia and dysrhythmias. Serious complications are associated with both regional as well as general anesthesia. Under regional anesthesia, cocaine can cause hypertension as well as ephedrine resistant hypotension, combative behavior, altered pain perception. The both patients had no clinical signs of cocaine use and were operated 31 hours and 10 hours after cocaine use. Spinal anesthesia was performed with 0.5% isobaric bupivacaine and anterior lumbar plexus block and lateral combined femoral-sciatic nerve block with 0.25% bupivacaine, without any clinical changes during the surgical procedure.

The onset of action, bioavailability, and duration of action are directly connected with the route of cocaine administration. Ingested cocaine is rapidly hydrolyzed primarily by plasma pseudocholinesterase and liver esterases to ecgonine methyl ester (EME) and benzoylecgonine [4]. These metabolites can be detected in urine for 60 h and up to 10 days following cocaine ingestion [4]. As a result, urine tests for cocaine are poor markers of acute intoxication, but may reflect surreptitious cocaine abuse in the past [4]. However, after this case report all hospitalized patients confirmed using cocaine, urine was collected to verify the presence of the metabolite. In both patients the cocaine metabolites in the urine were not evaluated, but after these two cases the

confirmation of the presence of the metabolite became routine in the hospital.

Cocaine has a short half-life in plasma (30-90 minutes) and is rapidly hydrolyzed into metabolites by plasma and liver esterases [5]. Duration is up to 90 minutes. A common route of administration, intranasal, can create symptoms within 3 min that last 30-45 min, but it still only possesses a 30% bioavailability due to nasal vasoconstriction (6). Intravascular injection takes 30 seconds to yield euphoria with almost 100% bioavailability. The peak effect can last 120 min [6]. The both patients had used cocaine nasally.

Administration of ketamine, atropine, or the older inhalational agents, halothane and enflurane, which can sensitize the myocardium to the effects of catecholamine's, should be avoided [7]. Ketamine should be avoided owing to its sympathomimetic properties, and potential to precipitate myocardial depression in the setting of exhausted catecholamine reserves. In these patients no ketamine or atropine was used.

Many cocaine abusers are not going to admit to it [8]. Patients with surreptitious cocaine abuse may manifest feelings of excitation, report weight loss, anxiety, requests for sedatives and pain medicine and complain of digestive problems. Cocaine abusers should be asked for timing, amount, and route of cocaine in the last 24 hours, and length of addiction [9]. In the two cases, the patients reported nasal cocaine use 31 hours and 10 hours before the surgical procedure.

Although there is no consensus and little evidence, a recent survey of anesthesia providers found that 30% believe it is prudent to wait until 7 days after a positive cocaine test before performing elective procedures [2]. The cancellation of surgery among patients who screen positive for cocaine use is a common practice in many surgical centers. However, there is paucity in literature studying the management of these patients going for urgent or elective surgery. Studying cocaine-positive trauma patients (n=465) compared to recent (<24 hours) *vs* patients who did not use cocaine immediately before injury (>24 hours) [10]. Outcomes were similar for mortality (3% *vs* 4%), infectious (18% and 19%) and neurologic (2% *vs* 1%) complications. Another study investigated the role of screening ECG as a safety protocol among patients going for elective surgery (n=40) [11]. No significant differences in episodes of ST segment elevation/depression >1 mm, recovery room stay, intraoperative body temperature, duration of anesthesia and total anesthesia/analgesic dose, were found when compared with controls that did not have a positive cocaine urine test. Using isobaric and hyperbaric spinal anesthesia, no change in ECG was observed during the surgical procedure.

When regional anesthesia is used, combative behavior; altered pain perception, cocaine - induced thrombocytopenia; and ephedrine - resistant hypotension may be encountered. Using hyperbaric spinal anesthesia with 12.5 mg of bupivacaine and isobaric with 15 mg bupivacaine, there was no hypotension or bradycardia, and no need for vasopressor or atropine. Local anesthetics (without epinephrine) may be useful in controlling intra and postoperative pain but local and systemic infections may be a contra-indication to their use. In the two cases, anterior lumbar plexus block (inguinal route) and lateral combined sciatic-femoral nerve block with 0.25% bupivacaine without vasopressor was used, with analgesia of more than 20 hours without opioid rescue.

Utilizing ERAS or ACERTO [12] protocols that include multimodal pain management enhances the delivery of patient-centered care to reduce surgical stress response and limit the need for an opioid to facilitate rapid recovery via early mobilization and proper nutrition. After recovery from spinal anesthesia, the patient ingested supplement still in the PACU and lumbar plexus block was performed with bupivacaine without vasoconstrictor.

Substance abuse is extremely common. Admission to hospital may occur as a direct result of the abuse or abusers may present for treatment of an unrelated condition. Patients with a normal ECG and without clinical signs of cocaine toxicity may proceed safely with surgery. The distinction between acute cocaine intoxication and recent cocaine use is meaningful because the cocaine urine toxicology test, which measures the cocaine metabolite benzoylecgonine, is a poor indicator of acute cocaine intoxication. However, larger prospective studies are needed to support this practice.

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