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Case Report

Interest of Caudal Anesthesia in Inguinal Hernia Surgery in Children, About 20 Cases

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Abstract

Introduction: Locoregional anesthesia occupies a major place in pediatric anesthesia because, combined with general anesthesia, it allows reducing the anesthetics doses, and it provides effective prolonged analgesia and allows reducing the use of opioids postoperatively. The main objective of our study is to show the interest of the caudal anesthesia in inguinal hernia surgery in children.

Materials and Methods: This is a prospective study, spread over a period of 9 months, involving 20 children operated for inguinal hernia.

Results: The FLACC score was less than 3 in all patients during the first 6 hours postoperatively. The incidence of PONV was 20% and the bladder was 10%.

Conclusion: Our study shows the benefit of caudal anesthesia in inguinal hernia surgery.

Keywords: Inguinal Hernia; Caudal Anesthesia; Children

Introduction

Locoregional Anesthesia (LRA) has become essential in pediatric anesthesia. Combined with general anesthesia, it reduces the dose of inhaled anesthetics. Also, it provides a prolonged per and postoperative analgesia and allows saving of morphine. All this allows early postoperative rehabilitation.

The caudal anesthesia was introduced in 1933. Since then, it has become the gold standard for inguinal hernia surgery. However, and due to the rich vascularization of the sacral space, the risk of systemic passage toxicity. Also, the caudal anesthesia is difficult to achieve in several situations such as spinal malformations or coagulation disorders.

The aim of our study is to evaluate the effectiveness of this block in the anesthesia of the treatment of Inguinal Hernia (IH) in terms of intra and postoperative analgesia and perioperative complications.

Material and Methods

This is a prospective study conducted in the Children's hospital of the Rabat, over 5 months.

A ultrasound-guided caudal anesthesia CB with 0.5 ml / kg of 0.25% Bupivacaine using a 20 G spinal needle.

The operations are carried out under general anesthesia. The anesthetic protocol is standardized. Intraoperative monitoring consists of a continuous electrocardiogram, a pulse oximeter, non-invasive blood pressure monitoring and capnography.

Induction with sevoflurane and then supplemented by administration of propofol at a dosage of 2.-mg / kg. A laryngeal mask is then inserted and the patient is then positioned for the performance of the block. The time to complete the block is noted and the surgical incision is made after a minimum of 15 minutes. Hemodynamic parameters are noted during the surgical procedure. Any increase in hemodynamic parameters of more than 20% means an insufficient analgesia and failure of the block. The treatment involves injection of 0.1 μg/kg of Sufentanyl.

The patients are transferred to SSPI after removal of the laryngeal mask where the hemodynamic parameters and the FLACC score are noted at H0, H1⁄2, H1, H2, H3, H6.

Results

The average age of the patients was 4 years with extremes ranging from 12 months to 9 years. The sex ratio was 4/1 and all patients were ASA I.

The average weight of our patients was 19 Kg, with extremes of 10 and 38 Kg. The blocks were performed on the first attempt in 90% of patients, and on the second attempt in 10% of patients. The average duration of the realization was 4.3 minutes.

The mean duration of the operative procedure was 38 minutes with extremes of 25 and 60 minutes. The median theoretical MAC was 2.5.

The variations in Heart Rate (HR), Mean Arterial Pressure (MAP) and halogenated requirements relative to the theoretical MAC intraoperatively are described in Table 1.

No dose of sufentanyl was administered. The average time between stopping Sevoflurane and removing the laryngeal mask was 7.1 min. Post-op pain was assessed using the FLACC score and the score did not exceed 3 (Table 2).

No patient received morphine after the surgery and just one patient was complicated by a vascular puncture. Typical side effects of post operative vomiting were present in 20% and hypotension in 10% of cases. The surgical team was satisfied with the conditions all

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Table 1: Per-opertaive variation of the heart rate, blood pressure and need of sevoflurane to have a theorique MAC.

	Heart rate	HR	HT	Blood pressure	Blood pressure	Blood pressure	MAC	MAC	MAC
	admission	Incision	end	admission	incision	end	induction	incision	end
CB	N 30% INC70%	N 100%	N100%	N60% INC %	N80% DEC 20%	N80% DEC 20%	100%	41%	33.50%

N : Normal, INC : Increase, DEC: Decrease.

Table 2: Score de FLACC en post-op.

	FLACC wake	FLACC 10 min	FLACC 20 min	FLACC 30min	FLACC 2H	FLACC 3H	FLACC 6H
CB	1-2	2-3	2-3	2-3	2-3	1-3	2-3

the time.

Discussion

The inguinal hernia is a congenital pathology due to the persistence of the vaginalis process.

It is common since the overall incidence varies from 0.8% to 4.4% in children of all ages and reaches almost 30% in premature infants.

This is a benign pathology but there is a risk of strangulation in 10 to 15% of cases involving the vitality of the intestine and the gonads [1].

This pathology mainly affects boys [1], 85% in the literature which almost equals the percentage found in our study.

The abdominal wall incision is responsible for severe pain after abdominal surgery. So an adequate analgesia is essential to facilitate early patient mobilization.

Locoregional anesthesia naturally found its place in this kind of ambulatory surgery. Associated with a general anesthesia, it makes it possible to reduce the doses of drugs in induction and to save morphine in the perioperative period.

The most widely used locoregional anesthesia technique is the caudal anesthesia by injection of a local anesthetic into the sacral canal (extension of the spinal canal) through the sacral hiatus [2].

This is the most common peri-medullary block in pediatrics. The technique of realization is easy. However, and despite the advent of ultrasound, this block continues to be performed based on the identification of the sacral hiatus [3,4].

Complications can be local (nerve damage, sacral osteomyelitis) or systemic (hypotension, arrhythmia, respiratory distress, convulsion), but remain low in incidence. Ecoffey et al analyzed data from 31,132 records and found only 8 patients with complications [4].

Complications like total spinal anesthesia are possible due to the proximity of the dural cul-de-sac. Ultrasound is very useful in preventing this risk: visualization of the anatomy of the caudal region, the position of the needle and the distribution of the local anesthetic.

To reduce the risk of systemic toxicity linked to the intravascular passage of local anesthetics. It is imperative to carry out an aspiration test before injecting the anesthetic solution but it is only of value if it is positive (during an intraosseous injection, at risk of systemic passage, the aspiration tests are negative). The injection of an adrenaline test dose (0.5_g kg^{-1}) is specific and sensitive, especially in children with whom verbal contact is impossible. The occurrence of an increase in heart rate of more than ten beats per minute and / or an increase in blood pressure of 15 mmHg and/or the appearance of ample T waves, ventricular extrasystoles, changes in blood pressure ST segment, big eminism on the Electrocardiogram (ECG), must then suggest a vascular passage and stop injection [5].

In our BC group three patients presented with post operative vomiting POV, one with urinary retention, another with vascular puncture and no patient presented convulsions, cardiac arrhythmias, nerve damage or infection at the puncture site.

Conclusion

Inguinal hernia surgery is the most frequent ambulatory surgery performed for child. The use of loco regional anesthesia seems to be the most appropriated for this situation because it allows for intra-operative saving of opioids and prolonged post-operative analgesia. This has been proven in our case series, providing comfort to the patient in the post-operative period and also to the surgeon.

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