

Research Article

Pudendal Nerve Block Under Neurostimulation during a Urological Surgery Funfair at the University Hospital Center of Mother & Child Lagoon (UHC-MCL): Procedure and Effectiveness in Children

Akodjenou J*¹, Deguenon S¹, Noukpozoukou B², Biaou COA³, Gbenou S¹¹Faculty of Health Sciences (Cotonou - Benin)²University Hospital Center of Mother & Child Lagoon (Cotonou - Benin)³Regional Institute of Public Health (Ouidah - Benin)**Article History**

Received: 20.05.2020

Accepted: 09.06.2020

Published: 18.06.2020

Journal homepage:<https://www.easpublisher.com/easms>**Quick Response Code**

Abstract: Introduction: In children, the pudendal block has recently experienced a significant boom in ensuring quality perioperative analgesia for perineal surgeries. The purpose of this work is to describe the process and the effectiveness of the pudendal block performed under neurostimulation. **Patients and Method:** This is a prospective study carried out in the pediatric surgery department of the UHC-MCL, from November 17 to the 22nd of November 2019 and it included all the children aging from 0 to 15 years old who would not only have benefited from a program within the framework of the funfair mission for hypospadias surgery but also be eligible for the pudendal block itself. The pudendal block was found to be effective in the absence of pain using the scale of 6 faces modified every 2 hours until the 24th hour. The data were collected from a form designed for this purpose. They were analyzed using Stata Version 14 software. **Results:** A total of 42 children had benefited from a surgical consultation but 18 were eligible (42.85%) for the present study. The latter had an average age of $6-10 \pm 2.23$ years with extremes from 10 months of life to 14 years. Hypospadias (anterior and balanic) was the most widely used surgical indication (55.55%). The children were classified ASA1 (92%) and ASA2 (8%). The pain assessment score was between 0 - 3 after 24 hours in 100% of children subsequently explaining the efficacy of the pudendal block. The average stay during hospitalization was 1.12 ± 0.36 days; the perioperative morbidity and mortality was null. **Conclusion:** The Pudendal Block seems to provide pretty good analgesia and a certain post-operative comfort to children who had surgery done. Taking into account the quality of the surgeries done on patients, the cost, the efficiency of the procedure and the post-operative comfort hence the realization of the pudendal block constitutes an alternative for fairground care.

Keywords: Pudendal block, neurostimulation, fairground mission, child.

Copyright © 2020 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

INTRODUCTION

Locoregional anesthesia techniques have recently been applied in cases related to postoperative analgesia and the treatment of chronic pain; also in particular peripheral blocks including the pudendal block (Bolandard, F. *et al.*, 2004). Postoperative pain has been considered an excellent model of acute pain with their management being based on multimodal analgesia including locoregional analgesia (Melzack, R. 1993; Landau, R. 2006).

Almost 80% of pediatric anesthesia procedures combine general anesthesia (GA) and locoregional techniques (LRA). LRA offers effective analgesia without the need for morphine therapy (Lanchon, R. *et al.*, 2014).

In children, the pudendal block has recently experienced a major boom, guaranteeing quality perioperative analgesia for perineal surgery (De La

Arena, P. *et al.*, 2014). Despite a satisfactory success rate when performed using neurostimulation (Bolandard, F. *et al.*, 2004), the risks of a rectal and / or a vascular puncture persist.

To this date, there have not been any studies done on the pudendal block that have been reported in Benin. Because urological surgeries are one of the most frequent outpatient surgeries in children, we have decided to assess the feasibility and effectiveness of the pudendal block, as part of the urological fairground mission organized by the NGO Chain of Hope. The point of this work was to describe the technique and the effectiveness of the pudendal block performed under neurostimulation.

PATIENTS AND METHOD

A prospective study was conducted within the pediatric surgery department of the University Hospital

Center for Mother and Child - Lagoon (UHC-MCL), from November 17th to November 22nd 2019, a period during which the mission of urological surgery took place. Children were recruited a day before the surgical procedures through a free surgical consultation. All children that were kept for surgery underwent a pre-anesthetic assessment.

This study included all children aged from 0 to 15 years enlisted specifically for the surgery of hypospadias (congenital malformation characterized by the opening of the urethra in the underside of the penis instead of just being at the tip). Children in need of other urological surgeries were excluded. We have studied the effectiveness of the unilateral or bilateral pudendal block in all children including the ones who

did not have any contraindications and the ones who have benefited from a program as part of this fairground mission.

The neurostimulator of type Stimuplex from B. BRUN (Figure 1) was used for stimulation on the pudendal nerve area. Short bevel needles of 50mm long were used in addition to the local anesthetic levobupivacaine 0.25% at a dosage of 0.3ml / kg for the block to work. General anesthesia was performed to control the upper airway. In order for the block to work, the child was installed in supine position, thighs in abduction, knees bent with the soles of the feet resting on one another and the ischial tuberosity was identified by palpation (Figure 2).

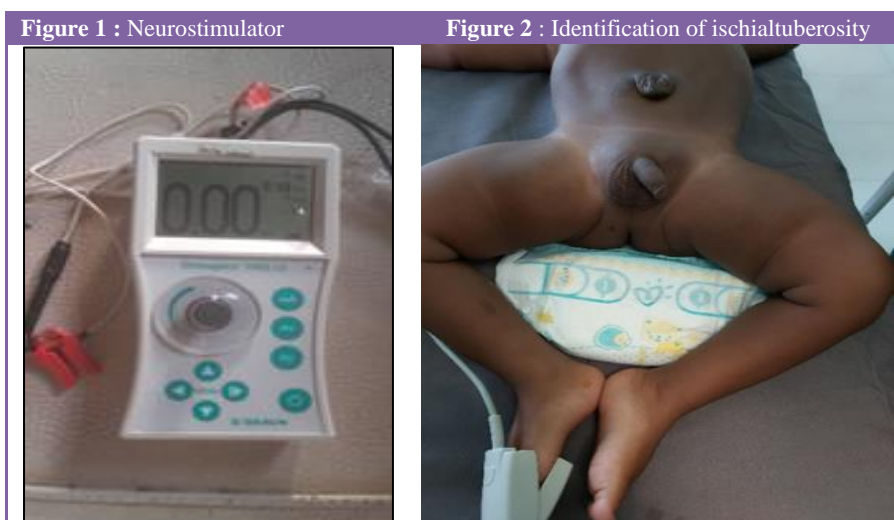


Figure 1 : Neurostimulator

Figure 2 : Identification of ischial tuberosity

The puncture point is located in the middle of the segment joining the anus to the cutaneous projection of the ischial tuberosity. The needle was then inserted perpendicular to the skin at the medial edge of the ischial tuberosity in a horizontal and sagittal plane. The neurostimulator was then turned on with an intensity of 1 milliamp (mA) to check for the presence of an adequate motor response. The motor response sought is the contraction of the external sphincter of the anus (anal blink) with lifting or not of the penis.

An amount of 0.3 ml / kg of levobupivacaine 0.25% was injected after an aspiration test and in the absence of a vascular puncture. Postoperatively, pain was assessed by the scale of 6 faces changing every 2 hours until the 24th hour in the department. Pain between 0 – 3 was considered mild, pain of 4 and 5 was considered to be as moderate and greater than 6 as severe pain. Post-operative analgesia was prescribed according to the intensity of the pain.

The variables studied were: age, surgical indications, anesthetic techniques, preoperative ASA status, presence of a motor response, pain experienced postoperatively, and complications related to the technique and death. Data was collected from a folder designed for each patient. They were analyzed using the Stata Version 14 software. The quantitative data were expressed as means followed by their standard deviations and the qualitative data were described by their frequencies. The parents of the children included were informed of the proposed protocol and their informed consent was obtained by signing the consent form established for this purpose.

RESULTS

A total of 42 children had benefited from the surgical consultation but 18 (42.85%) were selected for the present study (Figure 3).

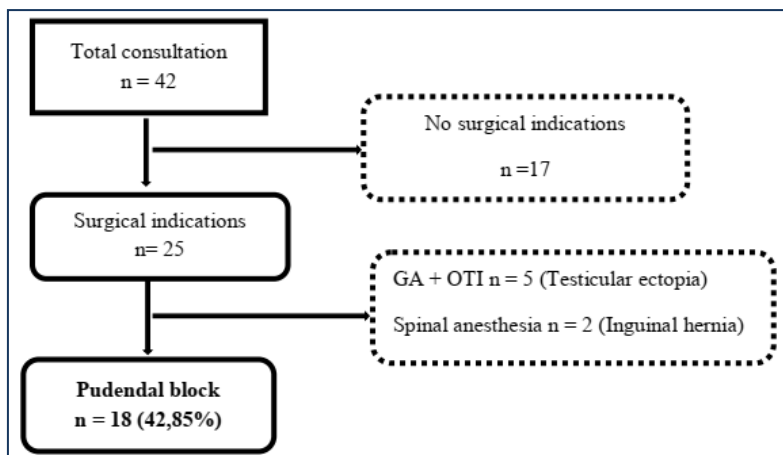


Figure 3: Study flow diagram

The average age of 6.10 ± 2.23 years with extremes from 10 months of life to 14 years in Table I shows the distribution of children by age group.

Table I: Distribution of children by age group

Age (years)	Data	Frequency (%)
< 1	2	11.11
2 - 5	6	33.33
6 - 9	8	44.44
> 10	2	11.11
Total	18	100.00

Hypospadias (anterior and balanic) were the most represented (55.55%). The surgical indications are listed in Table II.

Table II: Distribution of children according to indications

Conditions operated on	Data	Frequency (%)
Anterior hypospadias	6	33.33
Balanic hypospadias	4	22.22
Medium hypospadias	2	11.11
Peno-scrotal hypospadias	2	11.11
Epispadias	1	5.55
Buried micro penis	1	5.55
Section of the urethra post-circumcision	1	5.55
Post-hypospadias fistula cure	1	5.55
Total	18	100.00

An amount of 33.33% (n = 6/18) had a minimum checkup made of the blood count and 100% had benefited from blood grouping. All the operated children were of the class ASA1 (92%) and ASA2 (8%) and general anesthesia has been used associated with the pudental block +/- penile block. Table III shows the Anesthesia technique used.

Table III: Distribution according to the anesthesia techniques used

Anesthesia Procedure used	Data	Frequency (%)
Laryngeal mask + Pudental block	6	33.33
Laryngeal mask + Pudental + penile Blocks	8	44.44
GA + OTI + Pudental block	2	11.11
GA + OTI + Pudental + penile Blocks	2	11.11
Total	18	100.00

There has been no premedication prescribed and none of the children had any contraindication to these anesthetic techniques.

The prevention of Post-Operative Vomiting and Nausea (POVN) was systematic in all children by

the use of 0.15 mg / kg of dexamethasone for induction and prophylactic antibiotics were used in all operated patients. The contraction of the external sphincter of the anus was observed in all children before the injection of the local anesthetic.

Assessed using the 6-face scale the postoperative pain was between 0 - 3 in 16/18 children at the 6th hour and 4 - 5 in 2/18 children. But at the 12th and 24th hour, the pain remained low about 0 - 3 according to the rating scale for all children.

There has not been any complications noted and the average length of hospital stay was 1.12 +/- 0.36 days; also there has not been any deaths recorded.

DISCUSSION

The objective of this work was to describe the procedure and the effectiveness of the pudendal block performed under neurostimulation in the context of fairground activities.

Surgery for hypospadias appears to be painful but minor. Children turn out to be perfect candidates for this type of surgery, because they are more often healthy and most of the surgical procedures done to children are minor interventions (Baujard, C., & Roulleau, P. 2005).

According to the literature, the frequency of hypospadias is 1 in 300 male births and 1 in 80 to 100 in case of a family history of hypospadias. It has been found that there are 75% of anterior hypospadias including 15% of balanictypes and 50% of balanopreputialtypes. About 10% of the cases correspond to the average of penile hypospadias. Posterior hypospadias are rarer and correspond to 15-20% of the cases (Baskin, L. S., & Ebbers, M. B. 2006; Grapin, C.h. 2003; Mouriquand, P., & Mure, P.Y. 2003). The high rate of anterior and balanic hypospadias (more than half (55.55%)) found in our study can be likely comparable to the data from the literature.

There is a relationship between the American Society Anesthesiologist (ASA) categories and post-operative mortality and / or morbidity (Nouvellon, E., & Ripart, J. 2007). In the case of fairground surgery, the intervention is intended more so towards ASA1 (normal healthy patient) and ASA2 (patient suffering from a mild systemic disease) (Baujard, C., & Roulleau, P. 2005; Nouvellon, E., & Ripart, J. 2007), in order to minimize both morbidity and mortality. This procedure was followed in our study: 92% of the children were ASA1 and 8% ASA2. This could probably explain the 0% death rate obtained in our study.

The request for an overview is subject to a clinical assessment of the quality of the hemostasis and the study of family history. The low rate of complete Blood count (6/18) found is explained by the large number of normal healthy patients (ASA1) operated during the mission. Akodjenou *et al.* (2019) showed that in there is no systematic assessment in the absence of regular call signs in pediatrics.

General Anesthesia was associated with the realization of the pudendal block +/- penile block in all children to ensure post-operative analgesia and demonstrate the effectiveness of this block in the context of fairground care. The pudendal block would be better compare to the penile block or the caudal block in terms of analgesia after hypospadias surgeries (Naja, Z. M. *et al.*, 2013; Naja, Z. *et al.*, 2011; Kendigelen, P. *et al.*, 2016). Likewise during hypospadias surgery, Naja *et al.* showed a significant decrease in the number of children requiring post-operative analgesic in the pudendal group compared to the caudal group, as well as a decrease in the consumption of postoperative analgesic (Naja, Z. M. *et al.*, 2013). The authors found significantly different postoperative pain scores from the 12th postoperative hour. In the same way, these same authors demonstrated that the pudendal nerve block had lower pain scores and a longer duration of analgesia than the penile block when it came to circumcision surgeries (Naja, Z. *et al.*, 2011). In our study, the postoperative pain assessed by the 6-face scale was between 0 - 3 in 16/18 children at the 6th hour and 4 - 5 in 2/18 children. But at both the 12th and the 24th hour, the pain remained low on the value of 0 - 3 according to the rating scale thus showing the effectiveness of the pudendal block performed associated with general anesthesia. Our results are therefore consistent with those found by various authors (Naja, Z. M. *et al.*, 2013; Naja, Z. *et al.*, 2011; Kendigelen, P. *et al.*, 2016).

The use of 0.15 mg / kg of dexamethasone for induction is used to prevent nausea - post-operative vomiting and the prolongation of the analgesic effect of the local anesthetics used for Pudendal Block (Akodjenou, J. *et al.*, 2019). Antibiotic prophylaxis was systematically performed in all the patients. Its interest could be justified by the working conditions in the context of fairground surgery where the interventions are affected by an infectious risk which can range from 1 to 2% (Waddell, T. K., & Rotstein, O. D. 1994).

It is important to emphasize that the number of children included in this study is not sufficient to draw definitive conclusions on the effectiveness of the pudendal block technique in our context. Hence the need to conduct additional studies on a larger data to demonstrate a better effectiveness of the pudendal blocks in fairground care.

CONCLUSION

The Pudendal Block technique seems to provide pretty good analgesia and a certain post-operative comfort for the operated children. The realization of this gesture is fast, morbidity is very low and the cost of this technique remains also low.

Taking into account the quality of the results from patients that have been operated on, the cost, the efficiency of the technique and the post-operative

comfort, it can then be infer that the realization of the pudendal block constitutes a solution for fairground care.

REFERENCES

1. Bolandard, F., Bonnin, M., Mission, J., Duband, P., & Bazin, J. (2004, January). Bloc du nerf pudendal avec neurostimulation: type et frequence des reponses motrices. In *ANNALES FRANCAISES D ANESTHESIE ET DE REANIMATION* 23 (3), pp. R130-R130). Elsevier.
2. Melzack, R. (1993). Labour pain as a model of acute pain. *Pain*, 53(2), 117-120.
3. Landau, R. (2006). Anesthésie-analgésie pour le travail obstétrical. In *Congrès national d'anesthésie réanimation* (pp. 265-78).
4. Lanchon, R., Dubreuil, M., & Nouette-Gaulain, K. (2014, September). ALR en chirurgie pédiatrique: une technique fiable et efficace. In *Annales Françaises d'Anesthésie et de Réanimation* 33, (A398). Elsevier Masson.
5. De La Arena, P., Gaudet-Ferrand, I., Sola, C., Macq, C., Capdevila, X., & Dadure, C. (2014, September). Bloc pudendal sous échographie: faisabilité et efficacité peropératoire chez l'enfant. In *Annales Françaises d'Anesthésie et de Réanimation* (Vol. 33, p. A399). Elsevier Masson.
6. Baujard, C., & Roulleau, P. (2005). Anesthésie pour chirurgie ambulatoire en pédiatrie. *Le Praticien en Anesthésie Réanimation*, 9(3), 209-215.
7. Baskin, L. S., & Ebberts, M. B. (2006). Hypospadias: anatomy, etiology, and technique. *Journal of pediatric surgery*, 41(3), 463-472.
8. Grapin, C.h. (2003). Organogénèse et anatomie chirurgicale de la verge. Monographie du Collège Nationale de Chirurgie Pédiatrique. Hypospadias. SaurampsMedicaled.
9. Mouriquand, P., & Mure, P.Y. (2003). Chirurgie des hypospades. *Encycl. Med. Chir. Elsevier. Techniques chirurgicales-Urologie*. 41-340, 12 p. 2012.
10. Nouvellon, E., & Ripart, J. (2007). Faut-il encore croire au score ASA?.
11. Baujard, C., & Roulleau, P. (2005). Anesthésie pour chirurgie ambulatoire en pédiatrie. *Le Praticien en Anesthésie Réanimation*, 9(3), 209-215.
12. Akodjenou, J., Ahounou, E., Biauou, C.O.A., *et al.* (2019). Chirurgie foraine pédiatrique : organisation et prise en charge anesthésique. *Journal de la Société de Biologie Clinique du Bénin*, N° 031 ; 20-24
13. Naja, Z. M., Ziade, F. M., Kamel, R., El-Kayali, S., Daoud, N., & El-Rajab, M. A. (2013). The effectiveness of pudendal nerve block versus caudal block anesthesia for hypospadias in children. *Anesthesia & Analgesia*, 117(6), 1401-1407.
14. Naja, Z., Al-Tannir, M. A., Faysal, W., Daoud, N., Ziade, F., & El-Rajab, M. (2011). A comparison of pudendal block vs dorsal penile nerve block for circumcision in children: a randomised controlled trial. *Anaesthesia*, 66(9), 802-807.
15. Kendigelen, P., Tutuncu, A. C., Emre, S., Altindas, F., & Kaya, G. (2016). Pudendal versus caudal block in children undergoing hypospadias surgery: a randomized controlled trial. *Regional Anesthesia & Pain Medicine*, 41(5), 610-615.
16. Waddell, T. K., & Rotstein, O. D. (1994). Antimicrobial prophylaxis in surgery. Committee on Antimicrobial Agents, Canadian Infectious Disease Society. *CMAJ: Canadian Medical Association Journal*, 151(7), 925.