# Pudendal Nerve Block Versus Penile Nerve Block in Children Undergoing Circumcision

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**Purpose:** Penile nerve block is the most popular nerve block for the circumcision in pediatric patients. This study aimed to compare the analgesic efficiency of penile nerve block and the pudendal nerve block on postoperative pain and additional analgesic requirements in children undergoing circumcision.

**Material and Methods:** This prospective randomized double-blind study enrolled 85 children, aged 1 to10 years, undergoing circumcision. The patients were randomly divided into two groups either receiving dorsal penile block group (PNB-Group) or pudendal nerve block (PDB-Group). In the PNB-Group, 0.3 ml/kg 0.25 % bupivacaine was used; and, in the PDB-Group, 0.3 ml/kg bupivacaine was applied with nerve stimulator at a concentration of 0.25 %. In the postoperative period, the modified CHEOPS pain scale scoring and additional analgesic demand were evaluated at the 5th and 30th minutes and at the 1st and 2nd hours. The subsequent pain evaluations were made by the parents at home, at the postoperative 6th, 12th, 18th and 24th hours.

**Results:** Seven patients were excluded from the study, and seventy eight patients were evaluated for analysis. Patients in PDB-Group had significantly lower postoperative pain intensity and lower mCHEOPS scores (3.83 ± 0.98) when compared to the PNB-Group (6.47 ± 0.91) ($P < .01$) at all measurement times and none of patients in PDB-Group had additional analgesic requirements up to 24 hours. Patients in the PNB-Group had significantly more analgesic requirements at all measurements times except at the 1st, 2nd, 24th hours. 3.8%, 30.8%, 46.2% and 59% of the patients in the PNB group needed additional analgesia respectively at 5th, 6th, 12th and 18th hours.

**Conclusion:** Pudendal nerve block provided additional analgesic free period and had better analgesic efficiency compared to the penile nerve block lasting until 24 hours after operation.

**Keywords:** analgesia; circumcision; nerve block; pain; pediatric.

## INTRODUCTION

Circumcision is one of the most frequently performed penile surgeries, necessitated by cultural, religious and medical reasons. Although a minor same day surgery, circumcision is painful with postoperative pain being one of the significant problems. Topically or intravenously administered agents and caudal or penile nerve blocks constitute the routine modes of analgesia used. The analgesic method employed has to be reliable, effective and compatible with fast recovery and low incidence of complication in patients sent home shortly after the intervention. For postoperative analgesia the penile nerve block and caudal block have been using as common techniques.[1] While providing effective postoperative analgesia, the caudal block method can have adverse side effects such as subarachnoid, intraosseous and intravascular puncture, motor block and delayed postoperative micturition.[2]. Pudendal nerve block may be an alternative block to other blocks in circumcision. The pudendal nerve is a peripheral nerve with both motor and sensorial innervation of penis.[3] Some recent studies have reported that pudendal block provided better analgesia than caudal block in hypospadias surgery and also had shorter hospital discharge time which is an important topic for circumcision surgery.[4,5]

In this prospective, randomized double blind study, we aimed to compare the postoperative pain intensity and additional analgesic use after the application of dorsal penile nerve block and nerve stimulator guided pudendal nerve block in children undergoing circumcision.

## MATERIALS AND METHODS

### *Study population and inclusion criteria*

The study enrolled 85 children with ASA (American Society of Anesthesiologist Physical Status) I-II and in the age range of 1-10 years, planned to undergo circumcision, after obtaining the hospital ethical committee approval and the informed written consent of the parents. (Ethical approval no: 242893, Clinical trial no: NCT03258255)

### *Exclusion criteria*

Children with neurological or neuromuscular disorders, a history of hemorrhage or coagulation disorders were not included in the study.

After premedication with midazolam, the patients were taken into the operating room, for application of the appropriate monitoring and anesthesia induction achieved with propofol (2-3mg/kg), fentanyl (0.5 mcg/kg) and 2% sevoflurane. Laryngeal mask airway of the appropriate number was inserted without neuromuscular blocker administration and maintenance of anesthesia

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**Table 1.** Demographic data.

| | Pudendal Block (n=39) Mean ± SD | Min-Max | Penile Block (n=39) Mean ± SD | Min-Max | *p*-value |
|---|---|---|---|---|---|
| Age (month) | 44.1 ± 23.9 | 6-96 | 46.2 ± 32.7 | 9-120 | .714 |
| Weight (kg) | 17.0 ± 7.6 | 6.5-39 | 17.7 ± 7.5 | 8-35 | .779 |

was provided with 2% sevoflurane.
The patients' randomization was performed with sealed enveloped techniques (based on computer-generated random numbers), and they were randomly divided into two groups, as the penile nerve block group (PNB-Group) or the nerve stimulator guided pudendal nerve block group (PDB-Group).

### *Procedure*

In penile nerve block group (PNB group), dorsal penile block was achieved by two surgeons in the supine position, after skin sterilization, by palpating the symphysis pubis and perforating the Scarpa's fascia with a pop feeling by 25 G needle and injecting 0.25 % bupivacaine mixture of 0.3 ml/kg volume on the midline into the dorsal base of penis, between the pubis and the penis under Scarpa's fascia.
In pudendal nerve block group (PDB group ) Pudendal nerve block was performed by same two anesthesiologists a in the lithotomy position, after the appropriate skin sterilization. The nerve stimulator was adjusted to 3mA and 2Hz, and the stimulator needle (22-24 G Stimuplex A, 50-100mm, B. Braun, Melsungen, Germany) was inserted from the inferomedial of ischial tuberosities while palpating the tuberosities located at position of 3 and 9 o'clock of the anus (**Figure 1**). Bupivacaine administered as a 0.25 % mixture at 0.3 ml/kg volume. Injection was performed bilaterally after the perineal muscle contraction and the up-down penile movements. Dorsal penile nerve blocks were performed by two experienced pediatric surgeons and the pudendal nerve blocks were performed by two experienced anesthetists.

### *Pain Evaluation*

The primary outcome was the assessment of postoperative pain intensity and analgesic usage in the postoperative period. All patients were evaluated in the pediatric recovery room by two different anesthesiologists who did not know which technique was performed for analgesia during the surgery. The secondary outcome was to evaluate the hemodynamic response of the blocks during surgery.
Surgical incision was made minimally 15 minutes after the block. Before and after the block, the heart rate and the noninvasive arterial blood pressure were recorded first 5th minutes then every ten minutes during the surgery by anesthetists who performed the block and cared the patient during surgery. If any increase over 20% was seen, remifentanil infusion (0.1 mcg/kg/min) was started and the dose was increased if necessitated. In the postoperative period, after the patient was transferred to the recovery unit, the modified Children Hospital of Eastern Ontario Pain Scale (m CHEOPS) was used. The modified CHEOPS is an observational scale including five parameters of pain behavior which is scaling crying, facial expression, verbal response and body posture to assess the pain intensity of children aged between 1- 5-year-old, (mCHEOPS: 0 = no pain; 10 = severe pain) In this study the pain score which needs treatment was described as mCHEOPS 5 or higher score (**Figure 2**). The pain evaluation was performed at the postoperative 5th and the 30th minutes and the first and second hours. When mCHEOPS score was above 5, tramadol (1 mg/kg) was used. The postoperative pain evaluation and the analgesic applications were carried out by the recovery unit anaesthetists who were blinded to the type of nerve block technique. All patients were sent home after an average of 2 hours after the operation, when the control of pain, consciousness, nausea, vomiting and surgical complications were completed and the first nourishment had been provided. At home, pain evaluations were made at the postoperative 6th, 12th, 18th and the 24th hours by the patients' families using the Faces Pain Scale. The families, blind to the type of nerve block performed on the patient, were previously instructed on the postoperative pain evaluation which was made easy by the selective use of the Faces Pain Scale forms illustrated with faces expressing different degrees of pain. Use of ibuprofen (10mg/kg-orally) was recommended when the pain score of the patient was above 4.

### *Sample size*

The sample size was estimated on the basis of the number of patients per group. It has been suggested to be 35 with at least 40 % difference in pain scores between two groups with a power of 95 % at the 5 % significance level.

### *Statistical analysis*

The statistical analyses were carried out using the SPSS 15.0 package program for Windows. For the numerical data, descriptive analyses with the mean, the standard deviation and the median were employed. Percentages were used for the categorical data. The Student t-test was used for the normally distributed numerical variables in two independent groups. When normal distri-

**Table 2.** Comparison of mCHEOPS scores between Pudendal block and Penile block.

| | | Pudendal Block (n=39) Mean ± SD | Median | Penile Block (n=39) Mean ± SD | Median | Mean Difference | *p*-value |
|---|---|---|---|---|---|---|---|
| mCHEOPS | 5.min | 3.79 ± 0.80 | 4 (3-4) | 8.95 ± 2.24 | 10 (6-11) | -5.16 | < 0.001 |
| | 30.min | 3.69 ± 0.77 | 4 (3-4) | 5.74 ± 1.02 | 6 (5-6) | -2.05 | < 0.001 |
| | 1.h | 3.62 ± 0.92 | 4 (3-4) | 5.23 ± 0.43 | 5 (5-5) | -1.61 | < 0.001 |
| | 2.h | 3.84 ± 1.12 | 4 (3-5) | 5.21 ± 0.41 | 5 (5-5) | -1.37 | < 0.001 |
| | 6.h | 3.65 ± 1.01 | 4 (3-4) | 5.85 ± 1.16 | 6 (5-6) | -2.20 | < 0.001 |
| | 12.h | 3.81 ± 1.05 | 4 (3,5-4) | 6.59 ± 0.99 | 6 (6-8) | -2.78 | < 0.001 |
| | 18.h | 3.81 ± 0.97 | 4 (4-4) | 7.13 ± 0.73 | 7 (7-8) | -3.32 | < 0.001 |
| | 24.h | 4.46 ± 1.24 | 5 (4-5) | 7.10 ± 0.31 | 7 (7-7) | -2.64 | < 0.001 |

**Table 3.** Comparison of mCHEOPS scores within groups

| | Pudendal Block *p* value | Penile Block *p* value |
|---|---|---|
| CHEOPS 30.min - CHEOPS 5.min | .285 | < 0.001 |
| CHEOPS 1.h - CHEOPS 30.min | .564 | .002 |
| CHEOPS 2.h - CHEOPS 1.h | .088 | .564 |
| CHEOPS 6.h - CHEOPS 2.h | .200 | .003 |
| CHEOPS 12.h - CHEOPS 6.h | .201 | .009 |
| CHEOPS 18.h - CHEOPS 12.h | 1.000 | .026 |
| CHEOPS 24.h - CHEOPS 18.h | < .001 | .835 |
| CHEOPS 24 h - CHEOPS 5.min | .001 | < 0.001 |

bution was not observed, the Mann-Whitney U test was employed.

Ratio comparisons between the data on the two groups of patients were carried out by the Chi-Square analysis, the alpha significance level was rated by the $P < .05$ value.

## RESULTS

Although 85 children were included the study, seventy-eight children were eligible for analysis, thirty-nine patients were evaluated for each group; accurately seven patients had to be excluded from the study; at beginning of the study, one of them had a neurological disorder, two of patients had hematological disease, and four of patients had incomplete pain evaluation expected to be made at home (**Figure 3**). There were not significant differences between groups with respect to age and body weight (**Table 1**).

For the primary outcome, the postoperative pain evaluation by mCHEOPS scores were significantly higher in the PNB-Group than in the PDB-Group at each measurement time (**Table 2**). Statistically significant differences in the mCHEOPS levels of the patient groups were determined in follow up ($P < .001$, for both groups). In the PDB-Group, significant change did not occur in the mCHEOPS level until the postoperative 18th hour. The increase at the 24th hour was significant as compared to the levels at the postoperative 5th minute and the 18th hour ($P < .001$ and $P = .001$, respectively). In the PNB-Group significant falls were observed at the postoperative 30th minute vs the 5th minute and at the postoperative 1st hour vs the level at the 30th minute; with a significant elevation at the postoperative 6th hour vs the 2nd hour ($P = .003$). At the postoperative 24th hour the mean mCHEOPS score was significantly lower than that at the postoperative 5th minute ($P < .001$) (**Table 3**).

At the postoperative 5th minute a 38.4% additional analgesia requirement was observed in the PNB-Group. At follow up, the needs for additional analgesia were 0%, 7.7%, 30.8%, 46.2%, 59% and 59% at, respectively, the postoperative 30th minute, 1st, 2nd, 6th,12th, 18th and 24th hours. In the PDB-Group none of the patients needed additional analgesia until the postoperative 24th hour, when 75.7% of the patients had to receive additional analgesia. The requirement for extra analgesia at the postoperative 24th hour of the two groups did not differ significantly ($P = .121$) (**Table 4**).

In the perioperative period only two patients of the PDB-Group required remifentanil use during the first 10 minutes, while 18 patients in the PNB-Group required remifentanil use (**Table 5**). The initial mean systolic blood pressure (SBP) of the two groups did not differ significantly ($P = .871$). The mean SBP levels of the PDB-Group were significantly lower as compared to those of the PNB-Group between the 5th minute and the 20th minute after the incision (respectively, $P < .001$, $P = .037$, $P = .018$, $P < .001$, $P = .001$, and $P < .001$). However, the mean SBP of the groups did not differ significantly at the 20th minute ($P = .058$). Intragroup SBP levels of both groups did not differ significantly ($P < .001$, for both groups) (**Table 6**).

The initial mean diastolic blood pressure (DBP) of the two groups did not differ significantly ($P = .308$). The 5th minute mean DPB of the PDB-Group was significantly lower as compared to that of the PNB-Group ($P = .006$). The mean DBP of the two groups did not differ significantly at the 10th minute and before the incision ($P = .100$ and $P = .308$). After the incision, the mean DBP of the PDB-Group was statistically lower than those of the PNB-Group. While significant fall in the DBP as compared to the initial levels was observed in the PDB-Group ($P < .001$), in the PNB-Group significant fall was observed at all timings except at the perioperative 20th minute ($P < .001$).

The initial mean heart rate (HR) of the two groups did not differ significantly ($P = .197$). At the 5th minute after incision, the mean HR of the PDB-Group was significantly lower than that of the PNB-Group ($P < .001$). However, statistically significant intergroup differences were not observed in the mean HR at other timings.

No surgical complications were detected in the studied patients.

## DISCUSSION

Circumcision is one the most painful surgical proce-

**Table 4.** Comparison of additional analgesic requirements

| | | Pudendal Block n | % | Penile Block n | % | *P* |
|---|---|---|---|---|---|---|
| **Additional analgesic** | 5.min | 0 | 0.0 | 15 | 38.4 | < 0.001 |
| | 30.min | 0 | 0.0 | 0 | 0.0 | - |
| | 1.h | 0 | 0.0 | 3 | 7.7 | .241 |
| | 2.h | 0 | 0.0 | 3 | 7.7 | .241 |
| | 6.h | 0 | 0.0 | 12 | 30.8 | < 0.001 |
| | 12.h | 0 | 0.0 | 18 | 46.2 | < 0.001 |
| | 18.h | 0 | 0.0 | 23 | 59.0 | < 0.001 |
| | 24.h | 28 | 75.7 | 23 | 59.0 | .121 |

**Table 5.** Comparison of remifentanil (RF) usage percentage and dosage in perioperative period

| | | Pudendal Block n | % | Penile Block n | % | *p* |
|---|---|---|---|---|---|---|
| RF (%) | Beginning | 0 | 0.0 | 1 | 2.6 | 1.000 |
| | 1.min | 0 | 0.0 | 0 | 0.0 | - |
| | 5.min | 0 | 0.0 | 0 | 0.0 | - |
| | 10.min | 0 | 0.0 | 0 | 0.0 | - |
| | Before incision | 0 | 0.0 | 1 | 2.6 | 1.000 |
| | Incision 1. min | 0 | 0.0 | 26 | 66.7 | <0.001 |
| | □ncision 5. min | 2 | 5.1 | 23 | 84.6 | <0.001 |
| | □ncision 10.min | 2 | 5.1 | 23 | 84.6 | < 0.001 |
| | □ncision 20.min | 0 | 0.0 | 33 | 84.6 | < 0.001 |
| | | **Pudendal Block Mean ± SD** | **Median** | **Penile Block Mean± SD** | **Median** | ***p**** |
| RF mcg/kg/min | | | | | | |
| | Before incision | | | 0.05 | | |
| | Incision 1. Min | | | 0.13 ± 0.06 | 0.1 | |
| | Incision 5. min | 0.05 ± 0.00 | 0.05 | 0.16 ± 0.05 | 0.2 | - |
| | Incision 10. Min | 0.05 ± 0.00 | 0.05 | 0.17 ± 0.05 | 0.2 | - |
| | Incision 20. Min | | | 0.14 ± 0.05 | 0.1 | |

*sample size was not sufficient enough to create a *p* value

dures performed on the pediatric patient. It is obligatory to reduce postoperative pain of this outpatient surgery. Application of different anaesthetic and analgesic methods have been reported in the literature.[6] The most frequently reported methods are topical analgesia, and caudal and penile nerve blocks with each method resulting in different requirements of analgesia and incidences of side effects.

In caudal nerve block, complications specific to central block can be seen. Penile nerve block is simpler to perform than the caudal block and does not involve complications such as delayed mobilization and urinary retention which delay discharge from hospital.[7] However, complications including hematoma and edema development and anesthetic toxicity have been reported with penile nerve block which can be applied by differing approaches such as the dorsal penile nerve block or subcutaneous ring infiltration.[8] In this study, we have used the dorsal penile nerve block method. The dorsal penile nerve is a branch of the pudendal nerve and innervates the penile shaft, the urethra and the glans penis.[9] The results of this study have indicated an achievement of better analgesic effect with pudendal nerve block as compared to the dorsal penile nerve block which also resulted in reduced postoperative analgesic use. Less effective analgesia was observed after dorsal penile nerve block.

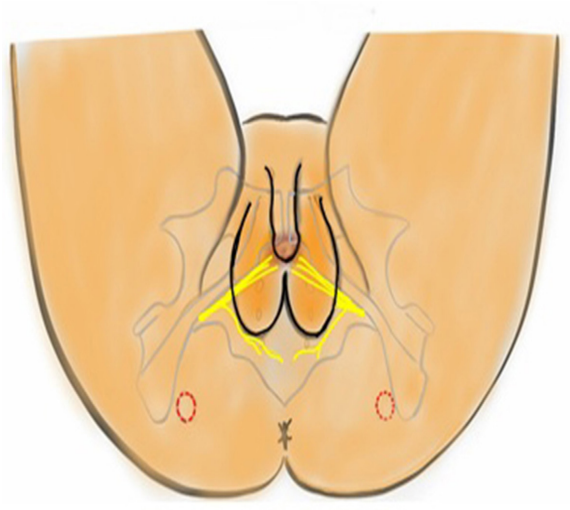

**Figure 1.** Pudendal block application area.

Faraoini et al. performed penile nerve block guided by ultrasonography (USG) or by using anatomical landmarks for circumcision of 40 children. Although there were no differences in the block failure in the two approaches, the USG-guided approach was observed to provide more effective analgesia and less use of analgesics. They reported that visualization of the dorsal penile nerve and the spread of the local anaesthetic during the application of the block increased the effectiveness of the penile nerve block.[10]

Sademan et al., using a similar approach with the assistance of USG or by use of anatomical indicators for penile nerve block, also reported that the use of perioperative opioids were reduced and better analgesia was provided by the USG-guided procedure. They reported that the one sided spread of the local anaesthic visualized by the USG aided nerve block, reduced the effectiveness of the nerve block.[11] It has been reported in the literature that the mean failure incidence of penile nerve block is 3-10% and that 30% of the patients require perioperative and postoperative additional analgesia.[11,12] In our study, as high as 38.4% of the patients operated with dorsal penile nerve block have required extra analgesic administration, and the possibility of not having blocked the scrotal branch of the pudendal nerve as well as the penile nerve may be considered to have contributed to this result. Studies on circumcisions performed by blocking the scrotal nerve and the dorsal penile nerve, which is not the routine method of penile block for circumcision, have reported increased analgesic effectiveness. In this respect, the routine pudendal nerve block is a better choice of analgesia as compared to the routine approach of penile nerve block.[13,14]

Pudendal nerve originates from the sacral nerve roots 2, 3 and 4; passes between the sacrospinous and sacrotuberous ligaments in the pelvis, passes through the pudendal canal and supplies the dorsal penile nerve, the inferior anal nerve and the scrotal skin innervation.[15] The ischial tuberosity, that the sacrotuberous ligament is attached to, is used as an anatomical indicator for determining the location of the pudendal nerve in our study.[3] This involves a more lateral entry point as compared to the method of Naja[14] comparing the pu-

| Score | 0 | 1 | 2 |
|---|---|---|---|
| Cry | No cry | Crying, moaning | scream |
| Facial | smiling | Composed | grimace |
| Verbal | positive | none or other complaint | pain complaint |
| Torso | neutral | Shifting, tende, upright | restrained |
| Legs | neutral | kick, squirm, drawn-up | restrained |

**Figure 2.** Modified Cheops Score.

dendal and penile nerve block methods in circumcision. Schmidt, on the other hand, has argued for the use of the ischial tuberosity for determining the ischial spine as the most suitable point for perineal approach to pudendal innervation.[16] In our study, 0.3 ml/kg, 0.25% bupivacaine was used for both the penile and the pudendal nerve blocks. Sfez et al. used 0.25 and 0.5 mg/kg bupivacaine for penile nerve block, achieving equivalent analgesic effectiveness with both doses, without differences in the time for peaking although the serum bupivacaine concentration was higher with the 0.5 mg/kg dosage but remained below the 4 mcg/ml limit of toxicity. In our study 0.75 mg/kg bupivacaine was used but the serum concentration was not determined. However, indications of local anaesthetic toxicity were not observed.[17] In another study on comparison of penile nerve and pudendal nerve block for circumcision,[14] lidocaine, fentanyl and clonidine were used. In this study, the time of discharge from hospital was given to vary between 2 and 6 hours. There were no differences in the arterial blood pressure and heart rate data in the two procedures. The better analgesia and less analgesic use achieved by this study in comparison to the outcomes in our PNB-group is attributed to the additional use of opioids and clonidine. In our routine surgery procedure, the mean time of discharge is 2 hours in the absence of complications which was achieved with all patients of our study. Also, in our study the mean systolic blood pressure of the PDB-Group of patients was significantly lower in comparison to the PNB-Group of patients and this was attributed to the effective and profound analgesia provided by the pudendal nerve block method.

One of the limitations of ours study is not recording the exact time of the initial use of rescue analgesics. Another limitation is having relied on parents to evaluate the postoperative pain severity.

The single disadvantage of the pudendal nerve block is placing the patient in the lithotomy position and the prolonging of the preoperative procedures by the preparative and application procedures of the pudendal nerve block. These details, however, have been overlooked in

**Table 6.** Comparison of hemodynamic parameters between groups

| | | Penile Block Mean ±SD | Median | Pudendal Block Mean ± SD | Median | *p* value |
|---|---|---|---|---|---|---|
| Systolic BP | Beginning | 96.3 ± 22.3 | 98 | 96.9 ± 10.1 | 96 | .871 |
| | 5.min | 81.3 ± 9.1 | 79 | 91.7 ± 13.5 | 92 | <0 .001 |
| | 10.min | 84.5 ± 9.5 | 85 | 89.7 ± 12.2 | 90 | .037 |
| | Before incision | 82.8 ± 10.1 | 83 | 88.9 ± 11.9 | 90 | .018 |
| | Incision 5.min | 83.4 ± 8.3 | 82 | 93.0 ± 16.8 | 89 | .001 |
| | Incision 10.min | 80.5 ± 8.4 | 79 | 91.7 ± 15.1 | 88 | < 0.001 |
| | Incision 20.min | 80.7 ± 9.6 | 79 | 86.3 ± 14.9 | 84 | .058 |
| | | **Penile Block Mean.±SD** | **Median** | **Pudendal Block Mean.±SD** | **Median** | ***p* value** |
| Diastolic KB | Beginning | 61.2 ± 16.1 | 60 | 57.3 ± 8.7 | 56 | .308 |
| | 5.min | 48.9 ± 9.0 | 45 | 53.9 ± 10.9 | 52 | .006 |
| | 10.min | 47.8 ± 8.8 | 46 | 52.3 ± 9.0 | 52 | .100 |
| | Before incision | 48.8 ± 9.2 | 46 | 51.2 ± 8.6 | 52 | .308 |
| | Incision 5.min | 48.1 ± 8.6 | 45 | 55.3 ± 10.8 | 53 | < 0.001 |
| | Incision 10.min | 46.9 ± 6.7 | 45 | 55.7 ± 14.8 | 52 | < 0.001 |
| | Incision 20.min | 46.5 ± 7.4 | 45 | 57.6 ± 18.1 | 52 | < 0.001 |
| | | **Penile Block Mean ±SD** | **Median** | **Pudendal Block Mean ± SD** | **Median** | ***p* value** |
| HR | Beginning | 112.4±30.3 | 114 | 121.6±20.9 | 122 | .197 |
| | 5.min | 109.2±15.5 | 104 | 115.3±20.5 | 120 | .086 |
| | 10.min | 104.8±16.0 | 98 | 111.8±19.6 | 114 | .057 |
| | Before incision | 104.6±15.1 | 104 | 110.3±18.4 | 110 | .068 |
| | Incision 5. min | 103.9±14.2 | 102 | 117.4±18.0 | 121 | < 0.001 |
| | Incision 10. min | 100.7±13.2 | 99 | 107.9±15.0 | 110 | .060 |
| | Incision 20. min | 98.0±9.9 | 96 | 96.7±15.0 | 96 | .657 |

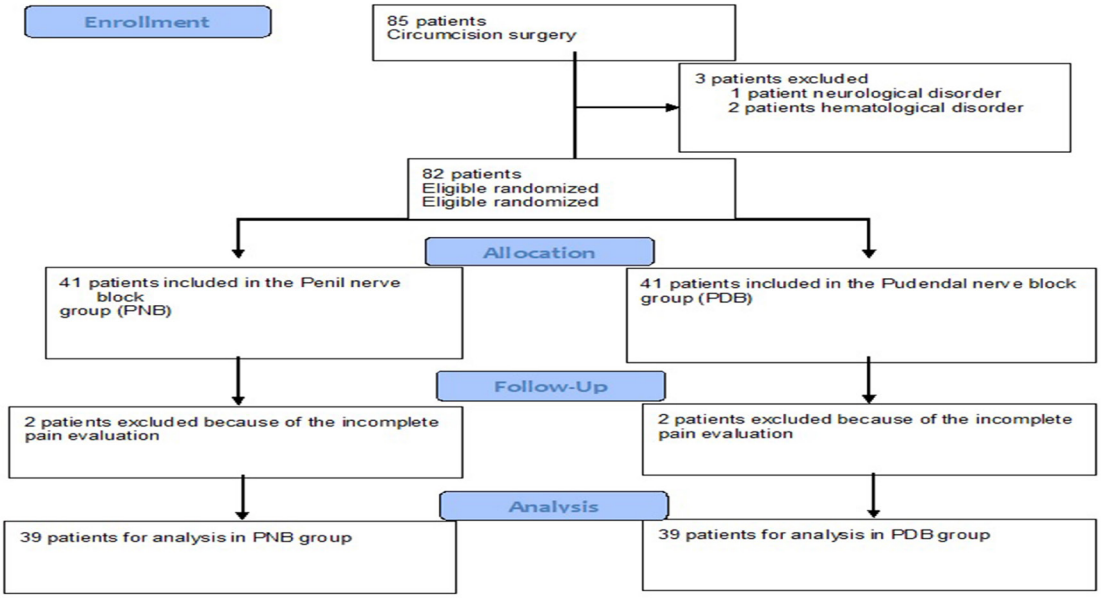


**Figure 3.** Flowchart of Consort diagram of patients' selection

view of the better analgesic effectiveness and patient comfort achieved by pudendal nerve block approach.

## CONCLUSIONS

In conclusion, we observed that the pudendal nerve block has provided a better analgesic effect and less use of postoperative analgesics as compared the dorsal penile nerve block. Pudendal block provided very comfortable and painless postoperative period in circumcision surgery, and seems to be a more favorable option relative to penile block.

## CONFLICT OF INTEREST

Authors declare that they have no conflict of interest.

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