Postoperative Analgesic Requirements in Children Undergoing Palatoplasty Using Nerve Block, Comparative Study

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Abstract

Background: Cleft Palate (CP) repair is associated with intense pain, which is difficult to assess and treat; different types of nerve blocks were described to control such pain.

Patients and Methods: 40 pediatric patients were divided into 2 groups: 20 patients received bilateral Greater Palatine Nerve block (GPN group) and 20 patients received bilateral Suprazygomatic Nerve block (SMN group). All regional block were received after general anesthesia. Intraoperative hemodynamics, number of fentanyl doses and complications were recorded. Postoperative analgesia (objective pain score), complications and parent satisfaction were also recorded.

Results: There were no significant differences between both groups in demographic data, hemodynamic parameters, intraoperative complications, postoperative complications and parent satisfaction. Intraoperative and postoperative analgesia were significantly less in GPN group than SMN group. Objective pain score was lower in GPN than SMN postoperative.

Conclusion: Bilateral GPN block in children undergoing palatoplasty was accompanied by superior levels of postoperative analgesia as compared to the use of bilateral SMN block in the same population.

Key Words: Cleft palate – Nerve block – Postoperative analgesia.

Introduction

THE use of regional nerve blocks for postoperative pain relief in infants and children has gained popularity in recent years as it provides a worthwhile pain-free period and avoids the complications of opioids and or Nonsteroidal Anti-inflammatory Drugs (NSAIDs) [1,2]. Postoperative pain is the major concern for morbidity particularly in children following palatoplasty, which results in poor oral intake leading to lassitude. Under treatment of pain in general results in serious physiological consequences and complications such as pulmonary dysfunction, delayed wound healing and delayed recovery [3].

Recently practitioners are more aware regarding the need for complete wellbeing of the pediatric patient in the postoperatively and not just a state of being pain free [4,5]. Local anesthesia with nerve blocks shows to be the solution in such situations. The aim of the work is to compare the postoperative analgesic effect and complications of both the bilateral greater palatine and suprazygomatic maxillary nerve blocks.

Patients and Methods

This study was performed at the Cairo University Specialized Children's Hospital from 2012 – 2014 after obtaining approval by the Hospital Ethics Committee, and a written informed consent from the parents. In this study 40 patients were randomly allocated by a computer-generated table into one of the 2 study groups; the randomization sequence was concealed in sealed envelopes.

Inclusion criteria were children from 6 months to 5 years old, ASA I-III, and scheduled to undergo palatoplasty. Exclusion criteria were bleeding disorders, skin lesions or wounds at site of proposed needle insertion, children with co-morbid conditions like congenital heart disease, respiratory pathology and central nervous system disorders, children posted for combined procedures like palatoplasty with cheiloplasty or submucosal alveolar bone grafting, known hypersensitivity to local anesthetics or opioids and lack of parental consent.

Study groups:
The two study groups were:
• Group GPN, 20 patients received bilateral greater palatine nerve block.
• Group SMN, 20 patients received bilateral suprazygomatic nerve block.

Preoperative assessment:
All patients were assessed clinically and investigated for exclusion of any of the above mentioned contraindications. Laboratory work needed was: Complete Blood Count (CBC); Prothrombin Time and Concentration (PT & PC); Partial Thromboplastin Time (PTT); Bleeding Time (BT); Clotting Time (CT) and liver function tests.

Methods:
Before cannulation by 30 minutes EMLA cream was applied to the site of venous puncture. Premedication in the form of oral midazolam 0.5mg/kg 30 minutes before procedure. Monitors included perioperatively were pulse oximetry, continuous ECG, non-invasive arterial blood pressure, and temperature monitoring.

General anesthesia induced using propofol with a dose of 1.5-2.5mg/kg over 20-30 seconds as tolerated by the patient, atracurium besilate 0.5mg/kg to facilitate endotracheal intubation and fentanyl 2µg/kg. Maintenance of anesthesia done using isoflurane 1.5% and atracurium intravenous infusion at a rate of 0.5mg/kg/hr.

Group GPN: Received bilateral greater palatine nerve block with levobupivacaine 0.25%.

Greater palatine nerve forms major part of the sensory supply to the hard palate. The nerve leaves through the greater palatine foramen. The nerve was blocked bilaterally as it exits through the foramen on palatal side opposite the anterior part of the 3rd molar or posterior part of the 2nd molar tooth. The foramen can be located by pressing a small cotton swab opposite first molar tooth and proceeding posteriorly till it ‘falls’ into a depression created by the foramen. A thin, short beveled (23 gauge, 30mm, Sung Shim Medical Co., Korea) needle was inserted from opposite side of the mouth at right angles into this depression and 1ml of 0.25% levobupivacaine (Chirocaine®; Nycomed Pharma AS, Solbarvegen, Norway) was injected after ensuring negative blood aspiration.

Group SMN: Received bilateral suprazygomatic nerve block with levobupivacaine 0.25%.

After general anesthesia and before start of surgery, blocks were performed aseptically with a 25-Gauge needle (90mm, 25gauge, GMS-S.N., Ghatwary, Egypt). The patient head was put in a neutral position. The entry point of the needle was situated at the angle formed by the superior edge of the zygomatic arch below and the posterior orbital rim forward. The needle was inserted perpendicular to the skin and advanced approximately 20mm depth to reach the greater wing of the sphenoid. The needle was then reoriented in a 20° anterior and 10° caudal direction toward the pterygopalatine fossa. Injection of 1ml of 0.25% levobupivacaine (Chirocaine®; Nycomed Pharma AS, Solbarvegen, Norway) was done over 20 seconds after ensuring negative blood aspiration.

In both groups there was no additional perincisional or palatine submucosa infiltration of local anesthetic by the surgeon. Intra-operatively, Mean Arterial Blood Pressure (MAP), Heart Rate (HR) and oxygen saturation was recorded before surgery, immediately after skin incision and every 10 minutes thereafter. When more than 15% increase in the pre-operative MAP or HR were noted, Fentanyl 0.5mcg/kg was injected intravenously. The demographic characteristics of the patients, duration of the surgery, and intra-operative doses of opiates were recorded.

After completion of surgery, reversal of muscle relaxant (atropine 0.02mg/kg and neostigmine 0.05mg/kg) and emergence from anesthesia the patients were transferred to Post-Anesthesia Care Unit (PACU). All patients received postoperative diclofenac sodium suppositories 1mg/kg every 12 hours. Paracetamol (perfalgan) at a dose of 10mg/kg I.V. was also given as rescue analgesia for patients in both study groups if the objective pain scores exceeded the score of 4.

Measured parameters:
1- Primary outcome:
   Pain assessment was done immediately postoperative and then hourly for the first 6 hours, then every 2 hours for the next 6 hours using Objective Behavioral Pain Score (OPS) [6] which is based on 5 criteria:
   • Arterial blood pressure.
   • Crying.
   • Movement.
   • Agitation.
   • Verbal evaluation (localization of pain).

Each criterion is given a score of 0-2, with 2 being the worst, making the total worst possible score of 10. A total score <4 was regarded as an indication of adequate analgesia.

Paracetamol 10mg/kg I.V. was given as rescue analgesia if objective pain score >4.
II. Secondary outcome:
1- Number of patients in each group who required rescue analgesia and number of doses required in the first 12 hours postoperative.
2- Incidence of postoperative complications in the form of postoperative nausea and vomiting, infection or hematoma formation.
3- The general satisfaction of the patients and/or their parents were also considered and recorded. Measures of satisfaction were measured on a 5 point scale of "extremely dissatisfied" to "extremely satisfied" as follows:
1- Completely dissatisfied.
2- Dissatisfied.
3- Not satisfied, nor dissatisfied.
4- Satisfied.
5- Completely satisfied.

Statistical analysis:
Hemodynamic parameters were expressed as mean ± SD and were analyzed using repeated measure Anova, if statistical significance was reached a tukey post hoc was performed.

Number of patients who needed analgesia, occurrence of complications and general satisfaction were expressed as absolute number (%) and analyzed using chi square (\( \chi^2 \)) or fisher's exact test, \( p \)-value <0.05 was considered as statistically significant, while \( p \) >0.05 was considered as statistically insignificant.

Sample size estimation:
Based on two-tailed \( \alpha \) error probability of 0.05 and \( \beta \) error probability of 0.2 (power of 80%), a total sample size of 34 patients randomly allocated into two equal groups (17 patients in each group) was required to detect a minimum clinically significant difference of 10% (effect size \( d=1 \)) in systolic blood pressure. Statistical power calculations was performed using computer program G*Power 3 for Windows. (Franz Faul, Universität Kiel, Germany). We enrolled 40 patients in the study (20 in each group) for the possible drop out.

Results
Forty pediatric patients were recruited to undergo cleft palate repair surgeries, these patients were divided into two groups randomly using closed envelop method of randomization. Group GPN received bilateral greater palatine nerve block, and Group SMN received bilateral suprazygomatic maxillary nerve block.

The demographic data of the patients including age, weight and gender did not show statistical significance between the two groups. Duration of surgery was comparable in the two groups. Values are Mean ± standard deviation (Table 1).

The Mean Arterial Pressure (MAP) and the mean heart rate preoperatively and intraoperatively showed no significant differences between the two groups and within each group.

As regard to the need for postoperative rescue analgesia which was in the form of Paracetamol 10mg/kg I.V., in Group GPN only 4 patients required rescue analgesia (1 patient required single dose, and 3 patients required 2 doses), while in group SMN 10 patients required rescue analgesia (1 patient required single dose and 9 patients required 2 doses), which was significantly more than those in Group GPN (\( p \)-value 0.024) (Table 2).

By comparing the Objective Pain Score (OPS) [6] of the two groups immediately postoperative and then at 1, 2, 3, 4, 5, 6, 8, 10 and 12 hours postoperatively revealed that there was significant difference between GPN Group, and SMN Group on PACU admission, 1, 2, 3, 4, 5, 6, and 8 hours. There was no significant difference between the two groups at 10 and 12 hours (Table 3).

There were no recorded complications in both groups either intra or postoperatively in the form of hemodynamic instability, injury to underlying structures, hematoma formation, infection or postoperative nausea and vomiting.

Parents' satisfaction showed no significant difference between the two groups (\( p \)-value 0.054) (Table 4).

Table (1): Demographic data, and duration of surgery; data is presented as mean ± SD or n (%).

<table>
<thead>
<tr>
<th></th>
<th>Group GPN (n=20)</th>
<th>Group SMN (n=20)</th>
<th>( p )-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (months)</td>
<td>15.6±4.1</td>
<td>16.4±3.7</td>
<td>0.553</td>
</tr>
<tr>
<td>Weight (Kg)</td>
<td>12.2±2</td>
<td>12.4±1.5</td>
<td>0.728</td>
</tr>
<tr>
<td>Gender:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>8 (40%)</td>
<td>11 (55%)</td>
<td>0.564</td>
</tr>
<tr>
<td>Female</td>
<td>12 (60%)</td>
<td>9 (45%)</td>
<td></td>
</tr>
<tr>
<td>Duration of surgery</td>
<td>63.8±5.8</td>
<td>64.6±6.4</td>
<td>0.661</td>
</tr>
</tbody>
</table>
Table (2): Number of rescue doses among the two groups, data is presented as n (%).

<table>
<thead>
<tr>
<th>No. of doses</th>
<th>Group GPN (n=20)</th>
<th>Group SMN (n=20)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>16 (80%)</td>
<td>10 (50%)</td>
<td>0.024*</td>
</tr>
<tr>
<td>1</td>
<td>1 (5%)</td>
<td>1 (5%)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3 (15%)</td>
<td>9 (45%)</td>
<td></td>
</tr>
</tbody>
</table>

*: p-value <0.05.

Table (3): Median and range of OPS for the two groups.

<table>
<thead>
<tr>
<th>Time</th>
<th>Group GPN (n=20) median/range</th>
<th>Group SMN (n=20) median/range</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>On PACU adm.</td>
<td>0/(0-4)</td>
<td>2/(0-4)</td>
<td>0.04*</td>
</tr>
<tr>
<td>1h</td>
<td>1/(0-4)</td>
<td>3/(0-5)</td>
<td>0.002*</td>
</tr>
<tr>
<td>2h</td>
<td>1/(0-6)</td>
<td>3/(0-6)</td>
<td>0.009*</td>
</tr>
<tr>
<td>3h</td>
<td>0/(0-4)</td>
<td>3/(0-8)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>4h</td>
<td>1/(0-8)</td>
<td>3/(0-8)</td>
<td>0.013*</td>
</tr>
<tr>
<td>5h</td>
<td>1/(0-9)</td>
<td>4/(0-9)</td>
<td>0.021*</td>
</tr>
<tr>
<td>6h</td>
<td>2/(0-5)</td>
<td>5/(0-9)</td>
<td>0.001*</td>
</tr>
<tr>
<td>8h</td>
<td>2/(0-9)</td>
<td>3/(0-8)</td>
<td>0.025*</td>
</tr>
<tr>
<td>10h</td>
<td>3/(1-10)</td>
<td>4/(0-10)</td>
<td>0.0827</td>
</tr>
<tr>
<td>12h</td>
<td>4/(2-10)</td>
<td>5/(0-8)</td>
<td>0.989</td>
</tr>
</tbody>
</table>

*: p-value <0.05.

Table (4): General parents’ satisfaction, data is presented as n (%).

<table>
<thead>
<tr>
<th></th>
<th>Group GPN (n=20)</th>
<th>Group SMN (n=20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely satisfied</td>
<td>9 (45%)</td>
<td>7 (35%)</td>
</tr>
<tr>
<td>Satisfied</td>
<td>8 (40%)</td>
<td>4 (20%)</td>
</tr>
<tr>
<td>Neutral</td>
<td>0</td>
<td>4 (20%)</td>
</tr>
<tr>
<td>Dissatisfied</td>
<td>3 (15%)</td>
<td>5 (25%)</td>
</tr>
<tr>
<td>Completely dissatisfied</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Discussion

Recently there is an increasing awareness regarding the need for complete well being of the child in the postoperative period and not just a pain free state.

Sedation and other adverse events produced by opioids do not help in achieving such a goal. Local anesthesia with nerve blocks appears to be the answer in such circumstances. Moreover, regional and general anesthesia techniques are no longer considered as alternative but instead, as complementary. This is especially true in pediatrics where regional anesthesia is essentially performed under general anesthesia. The association of the two techniques has dramatically cut down the risks of both procedures. Steven C. Hodges and Andrew M. Hodges [7] while reviewing anesthesia for cleft surgeries stated that opioids are better avoided, and intraoperative and postoperative analgesia can be achieved by local infiltration with local anesthetics or by nerve block.


Kamath et al., [10] compared between greater palatine nerve block and intravenous pethidine for postoperative analgesia in children undergoing palatoplasty. Obayah et al., [11] stated that addition of dexmedetomidine to bupivacaine for greater palatine nerve block prolonged postoperative analgesia after cleft palate repair. Palatal block, as described by Jonnavithula et al., [12], comprises blocking the greater (anterior) palatine, lesser (posterior) palatine and nasopalatine nerves on either side of the palate.

Bilateral suprazygomatic maxillary nerve block for cleft palate surgery was described by Mesnil et al., [13] who depended on three-dimensional study using computed tomography for identification of landmarks and measurements of the block. Sola et al., [14] used ultrasound guidance for suprazygomatic maxillary nerve block in infants.

Our study demonstrated that the use of bilateral GPN block in children undergoing palatoplasty was accompanied by superior levels of postoperative analgesia as compared to the use of bilateral SMN block in the same population.

As regard to the need for postoperative rescue analgesia, our results were consistent with the prospective, double blind, randomized trial of Kamath et al., [10] who enrolled children scheduled for palatoplasty and were alternatively allocated to two groups. Group A was given pethidine intravenously, whereas Group B, was given bilateral greater palatine nerve block with bupivacaine 0.25%, before the surgical stimulation. Whenever the pain score is more than 8, rescue analgesia with pethidine intravenously was given. The need for rescue analgesia was more in Group A. Our results were also similar to the prospective randomized controlled study performed by Jonnavithula et al., [12], who studied the efficacy of palatal block i.e. blocking of nasopalatine, greater and also lesser palatine nerves in children with cleft
palate undergoing palatoplasty; he enrolled pediatric patients undergoing cleft palate repair who were randomly allocated to three groups. No block was performed on Group NB for control, while Group S received volume of 0.5ml of normal saline and Group B received volume of 0.5ml of 0.25% bupivacaine for palatal block. The composition of rescue analgesia was a mixture of paracetamol and ibuprofen syrup. The number of demands or the analgesic requirement was significantly greater in NB compared to the Group B and Group S.

However, our results did not agree with the prospective randomized controlled study performed by Obayah et al. [11] who enrolled children who were scheduled for repair of a complete cleft palate using a combination of general anesthesia and greater palatine nerve block and were allocated randomly into one of two equal groups. In both groups, the greater palatine nerve block was performed using 0.5ml of solution bilaterally. The B Group received bupivacaine 0.25%, whereas the BD group received bupivacaine 0.25% with 1mg/kg dexmedetomidine. The rescue analgesia used was paracetamol 20mg/kg suppository. The study showed that all patients in the B Group required postoperative pain medication during the first 24h compared to 10 patients only (66.6%) in the BD group (p < 0.04). A possible explanation for the higher postoperative analgesic requirements in this study as compared to our work is that Obayah et al. [11] used 0.5ml of local anesthetic on each side while in our study 1ml of local anesthetic was used. Moreover, addition of dexmedetomidine to the local anesthetic in the BD group provided additional benefit to the local anesthetic.

As regard SMN block group results were consistent with the prospective descriptive study of Sola et al. [14], who inducted children scheduled for surgical cleft palate repair, and performed ultrasound guided bilateral suprasygomatic maxillary nerve block. Rescue analgesia was in the form of nalbuphine 0.2mg/kg administered intravenously up to a maximum of four times a day. In the case of breakthrough pain episodes after two consecutive boluses of nalbuphine, a continuous infusion of nalbuphine was administered for 24 hours. Sixteen patients (64%) required one bolus of nalbuphine within the first 48 hours, mainly in the recovery room, and five patients (20%) required a continuous nalbuphine infusion. The prospective descriptive study of Mesnil [13] enrolled children undergoing palatoplasty and received bilateral suprasygomatic maxillary nerve block of which none needed morphine in the postoperative period, and only six children (18%) required intravenous nalbuphine.

Our results concerning pain assessment using OPS [6] agreed with those of the prospective randomized controlled study of Jonnavithula et al. [12] who assessed postoperative pain using FLACC scale (Face, Legs, Activity, Cry, and Consolability) [18] by the postoperative nurses who were unaware of the study group. The mean FLACC scores in group NB were higher than those in Groups S and B. FLACC scores of Group NB were significantly greater than Group B and S but there was no difference between Group B and Group S. However, our results were not consistent with the prospective, double-blind, randomized trial performed by Kamath et al. [10] who used Children’s Hospital Eastern Ontario Pain Scale (CHEOPS) [18] for assessment of the quality of analgesia. Average pain scores were almost similar and not statistically different between the two groups except in the immediate postoperative period where 44% of Group A patients had pain score more than 8, whereas in Group B, it was only 12% which was statistically significant, after that the pain scores were comparable till 10 hours postoperative. A possible explanation for the comparable pain scores between the two groups in this study as compared to our work is that Kamath et al. [10] used pethidine 0.5ml/kg as rescue analgesia, while we used paracetamol 10mg/kg I.V.

The prospective, single-site, randomized, double-blind, and parallel-arm controlled study done by Chiono et al. [17] who enrolled 60 children who were assigned to undergo bilateral SMN block with general anesthesia using either ropivacaine (Ropi group) or isotonic saline (Saline group) on each side. During the first postoperative 48 hours, pain was assessed using the Children and Infants Postoperative Pain Scale (CHIPPS) score [18] every 10 min. in the Post Anesthesia Care Unit (PACU) and every 2 hours in the surgical ward. The Pain control was considered insufficient when CHIPPS score exceeded 3/10. There was no statistically significant difference in Pain scores (CHIPPS) in the immediate postoperative period 0 to 4 hours. After 4 hours, CHIPPS score still did not differ and median values were always equal to zero.

Our study showed that there were no recorded complications in both groups either intra or postoperatively in the form of hemodynamic instability, injury to underlying structures, hematoma formation, infection or postoperative nausea and vomiting.

The prospective, double-blind, single-site, randomized, and parallel-arm controlled performed
by Chiono et al., [17] who studied bilateral suprazygomatic maxillary nerve block for cleft palate repair in children showed two minor occurrences of bleeding related to the nerve block procedure. There were immediate venous bleeding at the site of puncture, which stopped following external compression for less than a minute. On the second postoperatively, one patient in the Ropi group experienced cheek hematoma in the infrrazygomatic area. Its size was 1 cm diameter approximately, palpable intra-and extraorally. No mouth opening restriction and no dysphagia were experienced. By day 5 visit, this hematoma was spontaneously resolved. No complications related to SMN block were noted at 5 days and 3 months postoperatively.

As regarding parental satisfaction, our results showed no significant difference between the two groups with the contrary to that of Jonnavithula et al., [12] who showed that the parental satisfaction of children who received block in the Group S was good in 66.6% of parents and 93% in Group B but in Group NB all the parents (100%) were poorly satisfied with postoperative pain management. The parental satisfaction was good in Group B and S (p < 0.000).

Conclusion and recommendations:

According to our results we can conclude that the use of bilateral GPN block in children undergoing cleft palate repair was accompanied by better postoperative analgesia as compared to the use of bilateral SMN block in the same population, as evidenced by significantly less need for postoperative pain management. The SMN block was done by a blind technique according to landmarks; this may explain the decreased efficacy compared to the GPN block. Safety and feasibility of the block can be increased by stimulating the temporal muscle using the nerve stimulator. The pterygopalatine fossa position is just behind the muscle; disappearance of the muscular response to direct stimulation with the block needle indicates its tip is in the infratemporal fossa. The pterygopalatine fossa could also be localized with ultrasound guidance. Moreover, the use of ultrasound imaging may be useful if the distance between skin and pterygomaxillary fossa were slightly modified by the presence of the cleft palate.

References


الملخص العربي

تسكن الألم بعد العملية الجراحية له تأثير إيجابي على المريض فيما يتعلق بحالته العامة، والتفاعل، والنمو، والخروج المبكر من المستشفى.

تسكن الألم يمكن من طرق التخدير الموضعي أو التخدير أو الأدوية المألوفة خاصة المخدرات ولكن مع فوق التخدير الناحي ظوا تجنبا للآثار الجانبية المميتة.

تقييم الألم في طب الأطفال من الصعب لأن الأطفال عادة لا يشككون القدرة على وصف الألم. ويمكن تصنيف تقييمات تقييم الألم إلى الملاحظات السلوكية وسببية والمؤشرات الأخرى. تقديم في ولاية محددة (السلوكية والسببية) والتي تقيم جوانب مختلفة من سلوك الأطفال (مثل قوة، ومكانية) قد يؤدي إلى تقييم أقل دقة للألم في الأطفال.

الأطفال الذين يخضعون لإجراءات تجميلية يشعرهم الانتظار من الفتق العصبي للأعصاب الفنية لتسقط الحلق، فقد تم وصف العديد من الطرق لتقشير تلك الأعصاب مثل الفتق العصبي الأولي على الجانبيين، الفتق الفوق وجنين لعصبي الفتق العلوي على الجانبين، الفتق العصبي الفني لمساحات الفتق، وتقييم الفتق المشمس يمكنfactor الاسءة للاجراء الجراحية.

وفي هذه الدراسة، نحن نقارن بين عصبي الفتق العصبي على الجانبين، الفتق الفوق وجنين لعصبي الفتق العلوي على الجانبين في الأطفال الذين يخضعون لإجراءات تجميلية في الحركة، فيما يتعلق بجراحات الفتق، وتأثر على استقرار النزول الدموية وحيدن مضغوطات، وكذلك درجة من المريض ورضا الوالدين. كانت مجموعات الدراسة إثنان:

• المجموعة الأولى: الفتق العصبي الكبير على الجانبين (عدد 20).
• المجموعة الثانية: SMN الفتق الفوق وجنين لعصبي الفتق العلوي (عدد 20).

تم اتباع اربعين طفل من المرضى الذين سيتم إجراء عصبيات تجميل الحركة في هذه الدراسة في مستشفى الأطفال جامعة القاهرة (إيبر). النسخة العصبية للمرضى من 18 شهرا إلى 5 سنوات، وتم توزيعهم إلى مجموعتين بشكل عشوائي عن طريق الحاسوب، تلقى جميع الأطفال في المجموعتين التجاير العام. ثم، بدأ التخدير الناحي عن طريق عصبي الفتق العلوي في المجموعتين بعد بدأ التخدير في الأخرى. اظهرت دراستنا أن عصبي الفتق العصبي الكبير على الجانبين في الأطفال الذين يخضعون لإجراءات تجميل الحركة كان يحقق مستويات متفقة من تسيك الألم بعد العملية الجراحية بالمقارنة مع الفتق الفوق وجنين لعصبي الفتق العلوي في نفس الفرق العصبي. وهم يفضل على هذا الفرق أن الحالة لمسكات الألم بعد العملية الجراحية كانت أقل في المجموعة GPN، وكذلك انخفاض درجات الألم تصل إلى 8 ساعات بعد العملية الجراحية في المجموعة GPN.

Michael Botros, et al.