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Case Report

Sensation and Phantom Limb Pain in Pediatric Oncology Patient: A Case Report

Sylvio Valença de Lemos Neto[1], Flávia C da Silva[1], Priscilla D Pimentel[1], Luiz Eduardo Imbelloni[2*]

[1]INCA Anesthesiologist, Responsible for the CET-SBA of the National Cancer Institute, Rio de Janeiro, RJ – Brazil

[2]Co-responsible for CET-SBA, Anesthesiologist Hospital Clínicas Municipal de São Bernardo do Campo, SP – Brazil

ABSTRACT

Although the nature of pain following amputations has been well documented for adults, little research has been conducted to determine the incidence, prevalence, and nature of phantom limb sensations and pain in children and adolescents. This case study documents the nature of phantom limb sensation (intensity, quality, location, duration, and frequency) for a 4 yr-old children after leg amputation. In PACU after extubation, she was agitated and with severe pain. The quality of sensations remained relatively constant and was described as itching and tingling. Both the duration and frequency of these episodes decreased throughout the 15 days. On the 16th day, she was discharged to residency, being followed up at the children's pain clinic at the hospital, and the intensity of her phantom sensations decreased gradually throughout this period. Regular follow-up was maintained by a multidisciplinary team. This case report with a 4-year-old child showed that the memory about his amputated limb occurs.

Keywords: Phantom Limb; Children; Cancer; Amputation; Epidural Infusions; Pain Management; Treatment

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***Corresponding author:** Luiz Eduardo Imbelloni**,** Co-responsible for CET-SBA, Anesthesiologist Hospital Clínicas Municipal de São Bernardo do Campo, SP – Brazil, E-mail: dr.luiz.imbelloni@gmail.com

INTRODUCTION

Literary material related to pain and sensation of the phantom limb pain in adult amputees is plentiful. In a retrospective study in children and adolescent amputees showed that less than half of the 60 patients experienced phantom sensations and phantom pain.[1] However, the loss of a limb due to surgery is associated with an increased probability of experiencing these phenomena.[1]

The pain and sensation of the phantom limb are quite complex entities for the understanding of adult patients. In the pediatric area, especially among young children, this approach becomes a great challenge, being essential the presence of a specialist in Pain Medication and a multidisciplinary team for the diagnosis and the appropriate treatment. Malignant bone tumors, according to the International Classification of Childhood Cancer (ICCC), are osteosarcomas, chondrosarcomas, Ewing's sarcomas, other specific malignancies, and non-specific bone tumors. These represent 5% of the tumors that occur during the childhood and adolescence, worldwide, with osteosarcoma being the most common bone tumor in the age group 0-19 years.[2]

In Brazil, Population-Based Cancer Registries (RCBP) have shown that the average incidence rates for malignant bone tumors was 5.32 per million for the age group 0-14, and 7.19 million for the 0-19 age group. Regarding osteosarcoma, there was a progressive increase in the incidence rate regarding age. However, it is noteworthy that three RCBPs provided incidence information in children younger than 5 years old.[2] Written consent has been obtained from patient's parents. The purpose of this case report is to report the presence of a phantom limb in a pediatric patient with bone cancer.

CASE REPORT

A girl, 4 years old, 17.5 kg, 112 cm, diagnosed with osteosarcoma in the right distal femur (Figure 1), using the following oral medications (PO): morphine 5 mg 4/4 hours, dypirone 500 mg until 6/6 hours if in strong pain and amitriptyline 12.5 mg at night. Computed Tomography (CT) of the chest highlighting images in lungs compatible with secondary implants (Figure 2) and laboratory tests without alterations. Scheduled right hip-femoral disarticulation.

Figure 1: Osteosarcoma in the right distal femur.

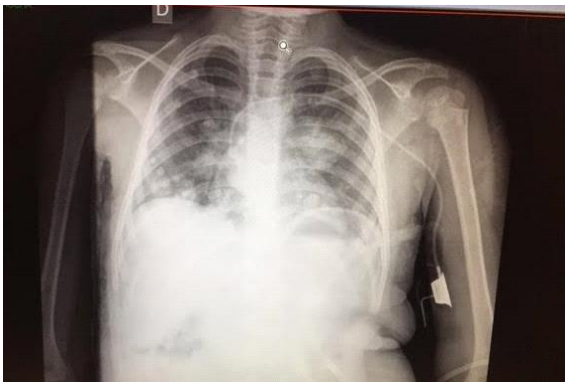

Figure 2: Computed tomography (CT) of the chest highlighting images in lungs compatible with secondary implants.

After entering the operating room (OR) with her mother, the patient was monitored with cardioscope, pulse oximeter and noninvasive blood pressure. A central venous catheter was completely introduced into the left upper limb with intravenous administration (IV) of midazolam 1 mg plus clonidine 20 µg, dexamethasone 2 mg, ranitidine 20 mg and cefazolin 550 mg in 0.9% physiological solution. Pre-oxygenation was initiated under facial mask, with subsequent anesthetic induction containing lidocaine 20 mg, propofol 40 mg, fentanyl 20 µg, esmolol 10 mg, rocuronium 10 mg and orotracheal intubation with a 5.5 mm tracheal tube, without a cuff. Continuous epidural block (L3-L4) was performed with 0.5% ropivacaine 3 ml and 1% lidocaine 5 ml. At the end of the procedure, which lasted 1:45 hours, dypirone 600 mg and ondansetron 3 mg IV and morphine 1 mg by epidural catheter (ECA) were administered. Neuromuscular blockade was reversed using neostigmine 0.5 mg and atropine 0.25 mg IV. After aspiration of the upper airways, orotracheal extubation was performed, without intercurrences. The patient was referred to the post-anesthetic recovery room (PACU), with Aldrete 9 (drowsy, but easily awaken when called).

After about 10 minutes of admission to PACU, the patient was very agitated, crying and screaming, requesting that the amputated limb to be modified, as well as reporting severe pain (CHIPPS = 9), being difficult to make an appropriate approach to pain complaint, being administered IV clonidine 50 µg diluted in 50 ml of 0.9% saline solution, and ropivacaine 0.2% 5 ml by ECA were administered. The patient was still agitated and complained of pain after 30 minutes of analgesic administration. After a new evaluation, midazolam 1 mg IV was administered. After 20 minutes, the patient was calm, without complaints and fell asleep. He was discharged from the PACU after 1 hour of observation. A few hours later, the patient got very agitated again, complaining of phantom limb pain (CHIPPS = 9), and receiving continuous infusion of 0.1% ropivacaine 2 ml/h by ECA. At this time, consultation with the Psychology Department was requested. At night, the infusion was increased to 0.1% ropivacaine 4ml/h, as the patient reported severe pain (CHIPPS = 9).

On the 1st postoperative day (PO), the child remained in pain, itching, and tingling and gabapentin 150 mg 12/12h orally was introduced. At the end of the day, she was calm and painless (CHIPPS = 0), allowing for mobility in the

bed, with the aid of physiotherapy. The family and the patient were more relaxed, as assessed by the multidisciplinary team.

On the 2nd PO Day, the patient still reported sporadic episodes of phantom limb pain (CHIPPS = 4), and gabapentin 300 mg 8/8h orally was prescribed. In the afternoon, she sat on the edge of the bed, with the aid of physiotherapist. On the 3rd day of PO, the minor reported CHIPPS = 2, being reduced the infusion of 0,1% ropivacaine by ECA to 1 ml/h. On the 4th PO, ECA was withdrawn, as the patient remained painless (CHIPPS = 0) for 24 hours. On the 6th day of PO, a walking program was initiated with physical therapy (Figure 3). The patient was discharged on the 7th PO Day, using the same doses of morphine and amitriptyline, as well as gabapentin (which she used for 15 days). Regular follow-up was maintained by a multidisciplinary team.

Figure 3: On the 6th day of the PO, a walking program was initiated.

DISCUSSION

This case report showed that memory about the amputated limb and phantom pain occurs in children, and the difficulty of treating this child in need of multidisciplinary support. Implantation of infusion systems for administration of continuous epidural analgesia with ropivacaine and morphine, amitriptyline and gabapentin, having been discharged to residency on the 7th day of postoperative.

Phantom pain is a painful sensation about the missing limb (or part of it) that can be present in various forms, such as burning, tightening, tingling, compression, or even intense and frequent pain. Such complaint may be present in the first week after amputation or appear months or even several years later, being located primarily in the distal part of the phantom limb.[2] The experience of phantom pain is the result of the interaction of several neuronal effects, seeing that several internal and external stimuli are present in its modulation. Attention, emotion, touching the stump or pressure, temperature change, autonomic reflexes, pain from another source, placement of a prosthesis are aggravating factors. Rest, distraction, stump movements, on the other hand, relieve pain.[2]

In a retrospective study with children and adolescents aged between 5 and 19 years, who underwent amputation of a limb in the last 10 years, it showed that 75% of children and adolescents reported phantom pain also had preoperative limb pain.[3] The sensation of a phantom limb and phantom pain occurs with a high incidence and lasts for weeks, months and years.[3] The 4-year-old child was discharged after 15 days with improvement of symptoms, being regularly monitored at the children's clinic.

In another study, in 25 children and young adults with cancer-related amputation, 76% of patients had experienced phantom limb pain.[4] After 1 year, though, only 10% still had phantom limb pain. The authors concluded that phantom limb pain following cancer related amputation in children and young adults appear to be common but generally short lived in most patients.

Parental reports tended to underestimated children's pain, especially acute pain. The gender, the age and the marital status affect the perceptions of both children and their parents about pain. The parental quality of life is affected especially when the pain is caused by life-threatening diseases such as cancer.[5]

Multiple drugs have been described in the treatment of complex pain cases, including local anesthetics, opioids, ziconotide, baclofen, clonidine, and midazolam.[6] The child received the following medications: morphine, clonidine, midazolam, amitriptyline, gababentin and epidural continuous ropivacaine. Aiming at an interdisciplinary hospital pain rehabilitation program for children and adolescents with chronic pain and functional disability, suggest that interdisciplinary pain rehabilitation is a promising approach to chronic pain and associated disability in children, with enduring improvements found 24-42 months following program completion.[7]

CONCLUSION

In a recent clinical narrative review the authors conclude that the literature does not support any single technique or drug to be superior to another.[8] However, optimized epidural analgesia and opioid patient control analgesia are acceptable as preventive strategies for the prevention of phantom limb pain. However, there is now a growing body of evidence supporting the use of gabapentinoids during the perioperative period to decrease postoperative pain and opioid use. The gabapentinoids decrease the hyperexcitability of dorsal horn neurons caused by tissue damage.[9] Likewise, because the gabapentinoids can prevent the establishment of surgery-induced central sensitization, these drugs may play a role in preventing the transition from acute pain to chronic pain.[10] To reach peak cerebrospinal fluid levels dosing of the gabapentin the evening prior to surgery may ultimately prove to be the most beneficial method of administration.[11] We think that patient could have been benefited with use of gabapentin prior to the surgery.

This case report with a 4-year-old child showed that the memory about his amputated limb occurs. Thus, the sensation of the presence of the amputated limb and phantom pain occur in children and deserve further investigation, especially in determining how to prevent and treat these children. Since the sensation and pain in the phantom limb may occur in amputees and children, this population deserves additional investigations, especially in

determining how to prevent and treat these phenomena in the most appropriate way, providing a better quality of life for such children.

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