

SURGICAL POSITIONING IN PEDIATRIC ROBOTIC SURGERY: EXPERIENCE REPORT

Posicionamento cirúrgico em cirurgia robótica pediátrica: relato de experiência

Posicionamiento quirúrgico en cirugía robótica pediátrica: relato de experiencia

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ABSTRACT: Objective: To report the experience of the first six cases of pediatric robotic surgery and the role of nurses who are specialists in robotic surgery in an oncology institution. **Method:** This is an account of experience report in clinical practice which encouraged the discussion about the first six cases of pediatric robotic surgery, which occurred between 2017 and 2019. **Results:** The process of implantation of pediatric robotic surgery started in 2017, with two initial cases (adrenalectomy and nephrectomy). All cases were followed up and performed in the presence of the proctor urologist surgeon to assist the pediatric oncology surgeon. Surgical positioning depends on the location to be approached and the robotic procedure that will be performed. **Conclusion:** The need for a realistic simulations with the participation of all team members to improve the care processes and permanent education in team formation was identified.

Keywords: Perioperative nursing. Robotics. Pediatrics.

RESUMO: Objetivo: Relatar a experiência dos primeiros seis casos de cirurgia robótica pediátrica e a atuação dos enfermeiros especialistas em cirurgia robótica em uma instituição oncológica. **Método:** Trata-se de um relato de experiência vivenciada na prática clínica que fomentou a discussão acerca dos primeiros seis casos de cirurgia robótica pediátrica, ocorridos entre 2017 e 2019. **Resultados:** O processo de implantação da cirurgia robótica pediátrica começou em 2017, com dois casos iniciais (adrenalectomia e nefrectomia). Todos os casos foram acompanhados e executados na presença do cirurgião urologista *proctor* para auxiliar a cirurgiã oncológica pediátrica. O posicionamento cirúrgico depende do local a ser abordado e do procedimento robótico que será realizado. **Conclusão:** Identificou-se a necessidade de uma simulação realística com a participação de todos os membros da equipe para melhoria dos processos assistenciais e da educação permanente na formação da equipe.

Palavras-chave: Enfermagem perioperatória. Robótica. Pediatria.

RESUMEN: Objetivo: informar la experiencia de los primeros seis casos de cirugía robótica pediátrica y el papel de las enfermeras especialistas en cirugía robótica en una institución de oncología. **Método:** Este es un relato de la experiencia en la práctica clínica, que fomentó la discusión sobre los primeros seis casos de cirugía robótica pediátrica, que ocurrieron entre 2017 y 2019. **Resultados:** El proceso de implantación de cirugía robótica pediátrica comenzó en 2017, con dos casos iniciales (adrenalectomía y nefrectomía). Todos los casos fueron seguidos y realizados en presencia del cirujano urólogo supervisor para ayudar al cirujano oncólogo pediátrico. El posicionamiento quirúrgico depende de la ubicación a abordar y del procedimiento robótico que se realizará. **Conclusión:** Se identificó la necesidad de una simulación realista con la participación de todos los miembros del equipo para mejorar los procesos de atención y la educación permanente en la formación del equipo.

Palabras clave: Enfermería perioperatoria. Robótica. Pediatría.

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Received: 12/04/2019 – Approved: 03/31/2020

DOI: 10.5327/Z1414-4425202000020009

INTRODUCTION

The treatment of childhood and juvenile cancer has advanced in recent decades due to the techniques of early diagnosis and the evolution of therapeutic methods. Each therapeutic planning determines the patient's chances of cure and has its particularities, recommendations, limits, and benefits, in addition to possible complications¹.

Surgical technology advances rapidly, becoming a common practice. The Da Vinci Surgical System® robotic surgical system, for example, is ideal for small spaces, so that robot-assisted surgery is extending into the pediatric specialty. The documented benefits of robotic surgery in pediatrics, since the first case in 2000, are basically the same as minimally invasive surgery through laparoscopy, with a shorter hospital stay, less bleeding, less incidence of pain, faster recovery, and better aesthetic result^{2,3}.

Surgical positioning in pediatric robotic surgery is similar to that of adult patients. However, the multidisciplinary team must take into account the size of the patient and understand the context of the robotic platform. Each robotic procedure requires different positions and the use of appropriate devices to assist in the patient positioning. It is important for the perioperative nurses understand the safest instructions for positioning the patients in robotic surgeries⁴.

Patient safety and the efficiency of the procedure can be compromised if the perioperative nurses is not trained in the care for patients undergoing robotic procedures or who do not have technical/scientific knowledge about the technology. Studies have shown some concern about the training and education of the nursing team in robotic surgery. Thus, institutions offered a training program for perioperative nurses involved in robotic surgery, providing skills to the practice of these professionals, reducing complications, promoting positive results for nursing care, and improving their quality indicators⁵⁻⁷.

The present study aims to report the experience of the first six cases of pediatric robotic surgery and the performance of nurses specialized in robotic surgery in an oncology institution.

Minimally invasive surgery has been a great challenge for nursing professionals who works with high-tech equipment and innovations in surgical techniques with exponential improvements. Thus, the engagement and empowerment of this professional with the multidisciplinary team are essential for assertive assistance, with quality and guarantee

of credibility in their theoretical and practical knowledge. The minimally invasive surgical technology by robotic modality increasingly makes the nursing professional updated and approach the specialists in this area, strengthening this type of study and encouraging professionals in the search for continuous improvement.

OBJECTIVE

To report the experience of the first six cases of pediatric robotic surgery and the role of nurses specialized in robotic surgery in an oncology institution.

METHOD

It is an account of experience in clinical practice that fostered the discussion about the first six cases of pediatric robotic surgery and the role of nurses who are specialists in robotic surgery in an oncology institution, between the years 2017 and 2019.

The scenario used is inserted in a large, philanthropic oncology institution, located in the city of São Paulo (SP). The surgical center (SC) has 14 surgical rooms, and 1,000 surgeries/month are performed there, on average. Out of these 1,000 procedures, about 40 are performed with robotic technology.

The process of implanting pediatric robotic surgery began in 2017, with two initial cases, an adrenalectomy and a nephrectomy. The other four subsequent cases performed were: nephrectomy, cystoprostatectomy, hysterectomy, and cystectomy. All were followed up and executed in the presence of the proctor urologist surgeon to assist the pediatric oncology surgeon.

The process of implanting pediatric robotic surgery is challenging. Initially, specific, well-designed, and multidisciplinary protocols were adopted, which guide professionals to perform their function safely.

RESULTS

On the eve of the surgery, the nurses in the robotic program gathered the materials and equipment to meet this surgical modality. Also, there was a realistic simulation with the participation of the surgical team, composed of:

DISCUSSION

nurse, nursing technician (circulating nurse), instrumentalist, surgeon, and anesthesiologist. Each team member performed excellently in the tasks performed. In addition, the importance of the institution of having the appropriate devices to assist in the surgical positioning in pediatric robotic surgery.

In the initial cases, patients submitted to adrenalectomy and nephrectomy were placed in lateral decubitus, under general inhalation and venous anesthesia. The perioperative nurse applied pressure redistribution adhesive coverage to the bony prominences that were supported on the operating table. The head was supported on the halo-shaped cephalic viscoelastic polymer, which is used to rest the head and avoid pressure on the external ear. One upper limb was supported by the viscoelastic polymer on the operating table and the other was parallel-positioned, on a pyramidal foam.

The patient's instability is corrected by flexing the lower limb supported on the operating table and keeping the upper one stretched in a pyramidal foam, reducing the pressure caused by the weight of the upper limb on the lower. Complete stabilization of the patient in lateral decubitus is achieved by applying a redistribution adhesive cover to the iliac crest and a tape strip with a fixation on the operating table.

In cystoprostatectomy, hysterectomy, and cystectomy surgeries, the Trendelenburg position was used, in which the patient is placed in supine position on the operating table and receives an inclination, where the trunk and head are in the lower plane. With this inclination, the natural tendency is for the patient to slide towards the head of the table. Therefore, there was a need to perform the fixation over the chest with a pyramidal foam and tape to avoid any accidental movement during the operation. The upper limbs were supported on the operating table, the hip region was supported on the edge of the table joint, and the lower limbs were flexed, facilitating positioning. The perioperative nurse must perform a positioning review after the robot is docked (approached to the operating table).

Surgical positioning certainly depends on the location to be approached and the robotic procedure to be performed. The nurse specialist in robotic surgery must be attentive to the details of the procedure and to the appropriate devices for surgical positioning. Positioning techniques were used in all patients, respecting their health condition and anatomical status. The wide experience of professional nurses in robotic surgeries had positive initial results in this new surgical modality.

Based on the available literature, the role of nursing in robotic surgery has a positive impact on both the patient and the multidisciplinary team, through their skills, combined with the improvement of care processes and permanent education in team formation^{6,8,9}.

Studies reinforce that one of the significant and challenging factors is the positioning of patients in robotic surgery, which is a shared responsibility between the perioperative nurse, the anesthesiologist, and the surgeon¹⁰. In another study, the authors highlight the importance of each team member in recognizing their role and responsibility in robotic surgery⁸.

An epidemiological study carried out in the city of São Paulo reported a cumulative incidence of pressure injury (PI) of 21.4% (95%CI 1.8–42.8) in hospitalized children treated at the SC, with a sample of 229 patients, with ages ranging between 30 days and 18 years. In this study, in addition to the known factors, such as immobility, humidity, surgical time, temperature variation, and body mass index, the associated risk factors were sedation/analgesia ($p=0.04$) and intensive care treatments, for example, mechanical ventilation ($p=0.001$)¹¹.

In the case of children and adolescents, empirical observations have indicated that 20 to 40 minutes of ischemia in bone prominences are sufficient for the development of tissue injury, with the consequent formation of PI¹¹.

To maintain the safety of these patients, it is important to have adequate devices for this surgical modality, in addition to inspecting the skin, the areas of bony prominences, respecting the anatomical body alignment, and documenting any changes in the integrity of the skin in the systematization form of perioperative nursing care (*sistematização da assistência de enfermagem perioperatória – SAEP*)^{4,7}.

Another study, conducted in the United States, assessed the clinical results and costs associated with robotic surgery in a pediatric population of 43 institutions participating in the research, of which 51% had cases in pediatrics. The findings indicated shorter hospital stay, but at a higher cost¹².

Robotic surgery is a technology that has been shown to be safe and effective for pediatric procedures, especially for tumor resections¹³.

Prospective studies have shown that the evolution of robotic procedures will offer alternative approaches to the treatment of pediatric patients, with improvements in care and quality of life¹⁴.

FINAL CONSIDERATIONS

This experience report made it possible to recognize the duties of nurses and members of the surgical team in pediatric robotic surgery. However, the need for a realistic simulation was identified, with the participation of all team members to improve the care processes and permanent education in team formation.

Another peculiarity observed in the study is the need for the institution to have adequate devices to assist in the

positioning of patient in pediatric robotic surgery. Therefore, the use of appropriate devices must be understood as a parameter of good nursing practices and of the multidisciplinary team, which can greatly contribute to the prevention of PI, resulting from surgical positioning.

The literature proved to be scarce. Thus, it is suggested that new studies be developed concerning the subject in question, aiming to act in clinical practice with excellence and to outline the role of nurses in robotic surgery.

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