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ANAESTHESIA CONSIDERATIONS IN ROBOTIC SURGERY

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ABS TRAC T

In recent days demand for minimally invasive surgeries has increased. As a result, robot assisted surgeries have gained popularity because they overcome several shortcomings of conventional surgical techniques. But robotic surgeries may require new innovation with regard to overall arrangement of operative equipment and personal and positioning which may go against the conservative nature of anaesthesia care. In summary while introduction of robotic surgery presents challenges in anaesthesia care it also offers opportunities for innovation and advancements.Anesthesiologist should get familiar either these changes by learning basics features of robotic surgical system to offer better anaesthetic care and patient safety for a better patient outcome.

Keywords: Robotic surgery, Anaesthesia, Remote surgery, Period preparation, Intraop management, Postoperative care.

INTRODUCTION

Robotic surgeries has emerged as a transformative technology in modern surgical practice, offering surgeons enhanced precision, dexterity, visualization compared to traditional approaches. This technology has revolutionized various surgical specialities like urology, gynecology, general surgery and thoracic surgery. This facilitates complex procedure and leads to a improved patient outcomes. However the success of robotic surgeries relies not only on technological sophistication of the system but also on meticulous pre-op planning inta-op management and post-op care. Anaesthesia plays an important role in ensuring patient safety, optimizing surgical conditions and facilitating a smooth recovery. Therefore, it is imperative to examine the unique implications of robotic surgery on anaesthesia practice.

Robotic surgical systems: overview, advantages and technical challenges. Robotic systems, such as da Vinci surgical system, are widely used in various surgeries. It consists of a control console from where the surgeon operates and a robotic unit with articulated arms equipped with surgical instruments which also offers HD 3D visualization and

magnification, as well as enhanced dexterity and precision. Robotic surgery offers many advantages, faster recovery and shorter hospital stay for patients. It also paves way for less invasive intervention and improved surgical outcomes. However robotic surgery is not without limitations and challenges. High cost, longer learning curve, maintenance and logistics are obstacles to their widespread adaptation. Complications specific to robotic surgery, such as thermal injuries and system malfunctions, require appropriate monitoring and management.

Preoperative considerations

A comprehensive preanesthetic evaluation is essential to assess the patients overall health status and to identify any potential risk or contraindication for anaesthesia. Assess comorbidities that may impact ventilation, cardiovascular stability and positioning and optimizing the medical conditions that may pose risk during intra-op period. Airway management plan for difficult airway should be ready during to restricted patient access once robot is docked.

Intraoperative anaesthetic management

Positioning for robotic surgery often require patients to be in Trendelenburg or Lithotomy positioned this positions can impact respiratory mechanism, venous return and circulation. Trendelenburg position increases intra abdominal pressure and reduce functional residual capacity of patient which affects lung compliance. PPV should be maintained adequately to prevent desaturation events especially when patients diaphragm is displaced due to CO2 insufflation and increased abdominal pressure. CO2 insulation also poses the risk of hypercapnia which is a result of CO2 absorption which can be managed by adequate ventilation.

Intravenous agents like propofol and etomidate, Inhalation agents like sevoflurane and desflurane are commonly used to provide adequate depth of anaesthesia. Muscle relaxants are typically required as robotic surgeries require stable and still patient

Achieving hemodynamic stabilization in robotic surgery patient is important as it ensures adequate tissue perfusion and O2 delivery while minimizing the risk of preoperative cardiovascular events. Hemodynamic strategies may include fluid management, vessoperssor or inotropic support.

Postoperative care

Following robotic surgery, vigilant monitoring of post-op complications are essential for early detection and intervention. Monitoring of vital signs and assessment of pain levels, evaluation of surgical site integrity and detection of potential adverse events such as bleeding, infection and thromboembolic events.

Effective pain management is paramount in enhancing patient comfort and facilitating early recovery following robotic surgery. Multimodal analgesia strategies, which combine various analgesic modalities to target different pain pathways. These strategies may include opioids, NSAIDS, acetaminophen, regional anaesthesia techniques.
Early mobilization plays an important role in decreasing complications, faster recovery and reducing length of hospital stay following robotic surgery.

Conclusion

Robotic surgery with its advancement in terms of precision and rapid recovery, represents a major advancement in modern surgical practice. However, its success relies on comprehensive preoperative management, where anaesthesia plays a important role in ensuring patient safety and optimizing surgical outcomes. In this article we have explored various aspect of anaesthetic considerations in robotic surgery, highlighting Importance of pre-op, intra-op, post-op care as well as prevention of complications. By incorporating various anaesthesia techniques and multimodal analgesia strategies, anesthesiologists can significantly contribute to the success of robotic surgery. A multidisciplinary approach involving surgeons, anesthetists, and other healthcare professionals is essential to promote a smooth and safe surgical experience for the patients.

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