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ANESTHETIC MANAGEMENT FOR HINDQUARTER AMPUTATION: PERIOPERATIVE CONSIDERATIONS AND CHALLENGES

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Abstract

Introduction

Hemipelvectomy, or the hindquarter amputation, is a well-known radical surgical procedure performed for the purpose of extensive malignant tumors, such as that of soft tissue sarcomas, that cannot be well managed with that of limb-sparing techniques. The procedure carries some of the significant risks, including that of massive blood loss, fluid shifts, as well as postoperative complications, therefore needing proper preoperative planning, intraoperative monitoring, as well as structured postoperative care.

Case Report

A 43-year-old male with a particular history of soft tissue sarcoma of that of the thigh, initially diagnosed in 2017, presented with some of the large recurrent tumor (23 cm × 33 cm) in 2023.

Given the tumor's progression as well as the size, an elective hindquarter amputation was planned.

Preoperative evaluation within the showed stable vitals, normal cardiac function, as well as the adequate coagulation parameters. The actual surgery involved general anesthesia with that of the epidural analgesia for the pain management. Significant intraoperative blood loss (-2100 mL) changed into controlled using the massive Transfusion Protocol (MTP), administering PRBCs, sparkling frozen plasma, and platelets in a balanced ratio. The affected person remained hemodynamically stable, was successfully extubated postoperatively, and became transferred to the ICU for monitoring and rehabilitation.

Discussion

Hemipelvectomy presents various challenges related to the blood loss, hemodynamic stability as a long-term rehabilitation. The use of that of the MTP, tranexamic acid, as well as calcium supplementation performed a vital position in preventing coagulopathy and retair balance. Epidural analgesia decreased opioid dependency and facilitated early mobilizati Postoperative management covered improved recovery protocols, physiotherapy. psychological aid to enhance the affected person's first-class of life.

Conclusion

This case highlights the importance of ate actual multidisciplinary approach in the process of managing complex forms of limb amputations. Advances in surgical strategies, anesthesia, postoperative care have stepped forward affecting personal outcomes. A based recovery plan, su as ache control and rehabilitation, is essential for reinforcing survival and functional variati following hemipelvectomy.

Keywords: Hemipelvectomy, Soft Tissue Sarcoma, Massive Transfusion Protocol (MTP) Hindquarter Amputation, Perioperative Management, Postoperative Rehabilitation

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INTRODUCTION

Hemipelvectomy which is also known as the hindquarter amputation, is a proper radical surgical procedure performed in the actual cases where malignant tumors, such as that of the soft tissue sarcomas, originate within that of the thigh or pelvis as well as they cannot be managed with limb-sparing techniques as a result of the size, location, or extent of the tumor[1]. The case study presented in this report involves a 43-year-old male who was mainly diagnosed with soft tissue sarcoma in his thigh in 2017, who mainly initially underwent excision as well as biopsy but was not on follow-up. Over the subsequent years, the tumor mainly progressed, which caused a massive swelling measuring about 23 cm × 33 cm, necessitating an elective hindquarter amputation. Given the complexity of the process, meticulous preoperative assessment was performed, including assessment of the affected person's vitals, ECG, and echocardiogram, which confirmed everyday cardiac features[3]. The surgical plan involved general anesthesia with epidural analgesia to control postoperative ache successfully. During the intraoperative duration, tremendous precautions had been taken, together with securing arterial and crucial venous get right of entry for fluid and blood transfusion control The surgery lasted for approximately of about 6.5 hours, with about an anticipated blood loss of 2100 mL, necessitating the actual transfusion of four units of about packed red blood cells (PRBC), fresh frozen plasma (FFP), as well as the platelets, bringing the actual total fluid input to 4810 mL as well as the output to 3450 [2]. The patient was very much closely monitored for metabolic as well as respiratory stability, and the serial arterial blood gas (ABG) assessments were mainly confirmed that this particular acidosis was very well prevented. Intraoperative monitoring which mainly involves volume-controlled ventilation, ECG, pulse oximetry, temperature, and invasive blood pressure measurement, ensuring the affected person remained hemodynamically strong. A crucial issue of the surgical treatment became the implementation of the Massive Transfusion Protocol (MTP) to manage immoderate blood loss, which worried retaining a balanced ratio of RBCs, plasma, and platelets while administering tranexamic acid (TXA) to control bleeding and calcium supplements to counteract the outcomes of blood product transfusions [4]. Following a hit, the patient was extubated without complications and shifted to the intensive care unit (ICU) for post-operative monitoring and pain management through the epidural catheter located at L2-L3. The discussion highlights that hemipelvectomy is an excessive-risk process requiring a multidisciplinary approach .The extensive rehabilitation required in various forms for post-surgery poses significant physical and psychological challenges, but various degrees of advancements in that of the surgical techniques as well as the enhanced recovery protocols (ERAS) have mainly improved both the survival rates as well as the quality of life [5]. The case mainly underscores the actual importance of careful intraoperative fluid as well as the blood management, continuous monitoring, and also the effective pain control strategies, which play a very pivotal role in the process of optimizing perioperative outcomes.

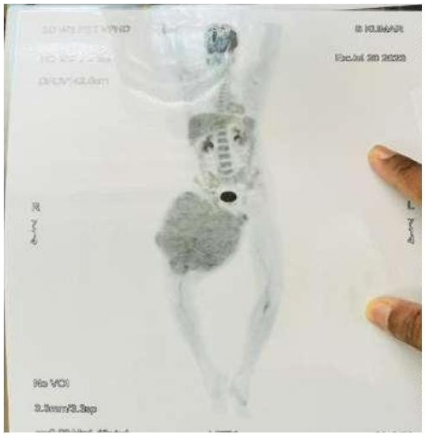

Figure: X Ray report of the patient

Case report

A 43-year-old male was diagnosed with that of a soft tissue sarcoma (STS) of the thigh in 2017. The patient mainly underwent excision as well as the biopsy at that time but was not on any form of follow-up. Over the years, the patient mainly experienced a gradual increase in the size of the swelling, which had become painful therefore significantly enlarged to 23 cm × 33 cm in 2023. The tumor's size as well a style progression rendered limb-salvage techniques infeasible, which had led to the decision to perform an elective hindquarter amputation. The patient had no significant form of comorbidities and was in a very stable condition preoperatively[6.] A complete assessment turned into performed, which includes an evaluation of his vitals, airway examination, laboratory investigations, and cardiac assessment. The preoperative vital signs were within normal limits: heart rate (HR) 87/min, blood pressure (BP) 130/80 mmHg, and oxygen actually in saturation (SpO2) 98% of room air. The airway assessment mainly had revealed a Mallampati classification II, indicating A very much normal airway anatomy suitable for the purpose of intubation. Laboratory investigations revealed that tab hemoglobin (Hb) level of 10.9 g/dL, with normal liver and well at the renal function tests. Coagulation parameters, including that of the prothrombin time (PT) of 13.9 seconds, international normalized ratio (INR) of about 1.24, and activated partial thromboplastin time (APTT) of 29.4 seconds, were inside suited limits. The electrocardiogram (ECG) showed ordinary sinus rhythm with T-wave inversion in leads V1 and V2. Echocardiography findings indicated a regular left ventricular systolic characteristic with an ejection fraction (EF) of sixty-four%, ruling out significant cardiac disorder. Based on these findings, a surgical plan related to fashionable anesthesia (GA) with an epidural catheter for postoperative pain control become formulated. A particular form of multimodal approach was taken to mainly ensure hemodynamic stability as well as the pain control. Prior to induction, the affected person was effectively fasted, and premedication was administered. General anesthesia turned into induced using fentanyl (one hundred mcg) and propofol (one hundred ten mg), observed with the aid of intubation with an eight size[7] endotracheal tube (ETT) constant at 21 cm. Proper positioning and bilateral air access were shown through 5-factor auscultation and capnography (EtCO2 tracking). Ventilation changed into maintained on extent manipulation mode, making sure adequate oxygenation and air flow . An epidural catheter was positioned at the L2-L3 stage for postoperative ache comfort, and a test dose of lignocaine with adrenaline (three mL) became administered, observed by way of sterile dressing. Given the excessive danger of large intraoperative blood loss, more than one vascular get admission to points had been secured, together with a 16G intravenous (IV) line inside the proper arm, a left radial arterial line (20G) for invasive blood strain monitoring, and a right-sided inner jugular vein (IJV) central line for fluid and transfusion control. Perioperative hemoglobin levels have been monitored, and a predicted blood lack of 2100 mL changed into recorded[8]. Serial arterial blood gas (ABG) analyses have been finished to evaluate metabolic popularity and fluid balance. Blood product transfusion changed into guided with the aid of hemoglobin stages and coagulation parameters. The patient mainly had received four units of the packed red blood cells (PRBCs) (totaling approximately 1100 mL), fresh frozen plasma (FFP), as well as the platelets (around 710 mL). The total intraoperative fluid input was about 4810 mL, while the total output (including blood loss and urine output) was about 3450 ml. Tranexamic acid (TXA) is administered to reduce fibrinolysis and prevent immoderate bleeding. Calcium supplementation was supplied to counteract the results of citrate toxicity from transfused blood merchandise. Throughout the process, the affected person remained hemodynamically stable without a big metabolic or respiratory acidosis. At the give up of the surgery, the patient became efficiently extubated and transferred to the in-depth care unit (ICU) for postoperative monitoring.

Post operative

Following extubating, the patient becomes intently monitored within the ICU for hemodynamic stability, pain manipulation, and capability complications. Continuous tracking protected ECG, pulse oximetry, invasive blood strain, and urine output dimension. Pain management became facilitated through the epidural catheter, which furnished effective analgesia and promoted early mobilization. Laboratory evaluations had been carried out to assess hemoglobin stages, coagulation reputation, and metabolic parameters. ABG analysis postoperatively revealed stable values, with that foe pH of 7.42, partial pressure of oxygen (PaO2) of 280 mmHg, as well as the lactate of 1.4 mmol/L, indicating adequate perfusion as well as the oxygenation. Hemoglobin levels were maintained at 11.2 g/dL postoperatively.

The primary post operative goals included the casual infection prevention, fluid balance form of optimization, early mobilization, and mental assist. The patient regularly transitioned to oral analgesics, and physiotherapy became

initiated to resource in recuperation and version to limb loss. Psychological counseling was furnished to cope with emotional and practical modifications put up-amputation.

Epidural analgesia proved useful in postoperative ache control, reducing opioid requirements and facilitating early mobilization[9]. Postoperative care performed an essential function in stopping headaches including infections, thromboembolic events, and mental misery. Early rehabilitation efforts, such as bodily remedy and intellectual fitness help, were critical to enhancing useful consequences and great of existence put up-surgery.

Figure: Amputated leg of the patient

DISCUSSION

Hemipelvectomy, or hindquarter amputation, is a highly complex surgical procedure requiring meticulous preoperative assessment, intraoperative management, and extensive postoperative care. The case discussed involves a 43-year-old male diagnosed with soft tissue sarcoma (STS) of the thigh, which progressed to a massive size over several years, necessitating surgical intervention, which advanced to a large size over numerous years, necessitating surgical intervention. Given the excessive-threat nature of the method, thorough anesthetic making plans become essential to ensure affected persons safety and optimize perioperative outcomes[11]. The preoperative evaluation blanketed comparing crucial symptoms, cardiac function, airway patency, and coagulation repute to expect capability complications. Intraoperatively, the primary mission was handling massive blood loss, which became approximately 2100 mL, requiring the activation of the Massive Transfusion Protocol (MTP). This protocol ensured a balanced replacement of purple blood cells, plasma, and platelets while retaining hemodynamic balance. The management of tranexamic acid (TXA) helped manipulate immoderate bleeding, and calcium supplementation counteracted citrate toxicity from transfused blood merchandise. The use of an epidural catheter for pain management at the L2-L3 degree facilitated better postoperative healing through lowering opioid necessities and selling early mobilization. Intraoperative tracking, together with serial arterial blood fuel (ABG) analyses, become critical to song acidosis, blood loss, and fluid stability [12]. The surgery lasted approximately 6.5 hours, and the patient remained hemodynamically stable with no metabolic or respiratory acidosis. Postoperatively, the affected person became extubated efficiently and transferred to the extensive care unit (ICU) for non-stop monitoring, where efforts were made to prevent complications together with infections, thromboembolic occasions, and not on time wound healing. Psychological support and rehabilitation performed an essential function in enhancing the patient's satisfaction of lifestyles put up-surgical operation, given the vast bodily and emotional challenges associated with limb loss. Hemipelvectomy is a challenging as well as the high-risk surgical intervention requiring multidisciplinary coordination. The primary indication for this particular procedure in the present case was a recurrent, large soft tissue sarcoma that was not very much amenable to that of the limb-sparing surgery. Given the big intraoperative demanding situations, which include blood loss, fluid shifts, and ability hemodynamic instability, meticulous anesthetic and surgical making plans turned into essential[10]. The position of MTP in this situation was pivotal in dealing with perioperative blood loss and preserving hemodynamic stability. The 1:1:1 transfusion method ensured clotting component alternative and oxygenation, minimizing the danger of coagulopathy. The successful execution of this technique underscores the significance of a multidisciplinary method, integrating anesthetic information, surgical precision, and better recovery after surgical procedure (ERAS) protocols to minimize headaches and optimize affected person outcomes. Advances in perioperative management, blood conservation techniques, and ache control techniques have significantly improved the survival quotes and practical effects of sufferer's present process hemipelvectomy. This case highlights the actual necessity of the proactive intraoperative monitoring, effective fluid as well as the blood management, and also the structured postoperative rehabilitation in order to ensure a smooth recovery. By adhering to that of the established surgical as well as the anesthetic protocols, medical teams can mainly improve perioperative safety and also to mainly enhance long-term patient prognosis following such as the extensive surgical interventions.

CONCLUSION

The successful execution of a particular hindquarter amputation for a specific large, recurrent soft tissue sarcoma in this particular case highlights the actual importance of meticulous preoperative planning, intraoperative vigilance, as well as the structured postoperative care. Given the complexity of that of the hemipelvectomy, the actual procedure required a multidisciplinary approach which mainly involved anesthesiologists, surgeons, as well as the intensive care specialists in order to mainly optimize patient outcomes. The preoperative assessment ensured that the affected person changed into healthy for surgical operation, with strong vitals, normal cardiac characteristics, and adequate coagulation parameters. Intraoperatively, the number one task changed into big blood loss, which became efficiently controlled the use of the Massive Transfusion Protocol (MTP), balancing the substitute of crimson blood cells, plasma, and platelets at the same time as stopping coagulopathy and hemodynamic instability[13]. The use of tranexamic acid (TXA) and calcium supplementation performed a critical function in controlling bleeding and preventing headaches associated with massive transfusions .Epidural analgesia at L2-L3 supplied effective postoperative pain relief, decreasing opioid dependency and facilitating early mobilization. Despite an extensive surgical period of 6.5 hours, the affected person remained hemodynamically stable without any metabolic or respiratory acidosis, demonstrating the effectiveness of intraoperative monitoring, serial arterial blood gas (ABG) evaluation, and fluid stability

management. Postoperatively, the affected person turned into correctly extubated and transferred to the ICU for non-stop commentary, wherein an aggregate of more desirable recovery after surgical treatment (ERAS) protocols, physiotherapy, and psychological help performed an important position in his rehabilitation. The case underscores the crucial function of multidisciplinary coordination in managing excessive-risk surgical instances, emphasizing that early prognosis, well timed intervention, and effective perioperative care are key to improving survival fees and excellence of life in patients undergoing hemipelvectomy. Advances in anesthetic strategies, blood conservation strategies, and pain management have drastically advanced affected person effects, decreasing the chance of complications and enhancing post operative recuperation. The significance of long-time period rehabilitation, such as prosthetic variation and psychological counseling, cannot be overstated, as they contribute significantly to the affected person's capability to reintegrate into day-by-day life put up-amputation. This case serves as a proper valuable reference for the best practices in perioperative management of the extensive limb amputations, reinforcing the various requirements for continuous advancements in the surgical techniques, intraoperative monitoring, as well at the postoperative recovery strategies in order to further enhance patient prognosis and functional outcomes.

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