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CASE REPORT

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Association of Multimodal General Anesthesia and Regional Block for Thoracic Interscapular Amputation in an Elderly Patient. Case Report.

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ABSTRACT

Background: Proximal amputations of major limbs due to malignant tumors have become rare, but they are still a valuable treatment option for palliation and, in some cases, can even be curative. The aim of this case report was to analyze the outcome of interscapular-thoracic amputation in an elderly patient.

Case Report: Male patient, 85 years old, BMI of 1.77 kg/m², ASA III, with systemic arterial hypertension using losartan 50 mg daily. Smoker and history of deep vein thrombosis. History of hand ulcers, evolving to ulceration and bleeding. Squamous cell carcinoma biopsy. Indicated thoracic interscapular amputation (TIA) under regional associated with multimodal general anesthesia. Interscalene and serratus anterior block with ropivacaine 0.5% and use of US. Postoperative period in the ward without pain. Evolved during the three days without pain complaints.

Conclusion: TIA in an 85-year-old patient, as a primary or palliative procedure, may be justified after a careful holistic evaluation of the case. Interscalene brachial plexus block associated with the serratus anterior plane with 0.5% ropivacaine and complemented with multimodal general anesthesia allowed shoulder disarticulation with adequate safety for the patient and comfort for the surgical team, excellent postoperative analgesia and no complications.

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Amputation, Perioperative pain management, Interscalene block, Serratus anterior block, Multimodal anesthesia.

Introduction

Non-melanoma skin cancer or squamous cell carcinoma (SCC) accounts for approximately 30% of all malignant tumors diagnosed in the country and is the most common type of cancer in the Brazilian population [1]. According to estimates from the National Cancer Institute, between 2020 and 2022, approximately 177,000 new cases of the disease will be registered each year in Brazil [1]. In the period between January 1, 2010, and December 31, 2021, 1,224 histopathological examinations were performed on the upper limbs of 708 patients, the most common being squamous cell carcinoma with an incidence of 94.1% [2].

Forequarter amputation is performed for malignant tumors in the proximal part of the upper extremity (shoulder or axillary region) when involvement of critical structures such as the neurovascular bundle in the axilla precludes a minor procedure [3]. Thoracic interscapular-amputation (TIA) is the surgical separation of the humerus (upper arm bone), scapula (shoulder blade), and a portion of the clavicle (collarbone) from the shaft. In this procedure, the entire shoulder and upper arm are removed, and was described by Berger, a French surgeon, in 1887. In 1891, he advocated TIA in cases of malignant disease of the upper end of the humerus in a discussion before the Surgical Society of Paris and New York [4, 5].

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National health care guidelines for amputees showed that in the last five years more than 102,000 amputation surgeries were performed by the Brazilian Unified Health System (SUS) [6]. Total limb amputation requires an adequate rehabilitation process with a support network, allowing autonomy and social inclusion. Proximal amputations of larger limbs due to malignant tumors have become rare, but they are still a valuable palliative treatment option and, in some cases, can even be curative.

In 45 patients, including TIA in 14 patients, shoulder disarticulation in 13 patients, and lower limbs in 18 patients, it was shown that proximal amputations of major limbs seriously interfere with the body function of patients and are the last, although valuable, option within the concept of treatment of malignancies of extremities or serious infections. In addition to the short survival, high rates of complications and postoperative pain, the quality of life of patients can be improved for the time they have left [7].

Several techniques have been described involving concomitant chest wall resection with reconstruction. Forequarter amputation is a radical ablative surgical procedure that includes the entire upper extremity with its shoulder girdle [8]. The aim of this case report is to demonstrate the association of multimodal general anesthesia with peripheral nerve block for this uncommon but valuable surgical procedure (TIA) for a malignant upper extremity tumor in an elderly patient.

Case Report

According to Circular Letter number 166/2018-CONEP/SECNS/MS published on June 12, 2018, by the Ministry of Health, this case report was registered on the Plataforma Brasil (CAAE: 85472324.1.0000.5274), and the Ethics Research Committee approved this case report (Number: 7.291.547). After explanation of the procedures to be performed, the patient and family members signed the Free and Informed Consent Form and authorization to publish in a scientific medical journal.

Male patient, 85 years old, weighing 53 kg, with a height of 173 cm and BMI of 1.77 kg/m², classified as ASA III, with systemic arterial hypertension using losartan 50 mg daily. The patient is a long-time smoker and uses warfarin 5 mg for deep vein thrombosis, which was discontinued five days before surgery.

The history of the disease began with a hand ulcer caused by a mosquito bite that did not heal. Two years later, the patient began to bleed and sought primary care and was referred to INCA. The examination revealed an ulcerated and bleeding lesion on the right hand, associated with ipsilateral axillary lymphadenopathy, and a biopsy of the lesion revealed squamous cell carcinoma (SCC). Chest X-ray showed normal lung transparency, free costophrenic sinuses and normal cardiac silhouette. Computed tomography (CT) revealed an extensive expansive and infiltrative lesion in the right axillary region (Figure 1), extending to the skin, with irregular contours and close contact with the pectoral muscles with lymph node dissemination, indicating right interscapulothoracic disarticulation surgery, with ipsilateral axillary dissection.

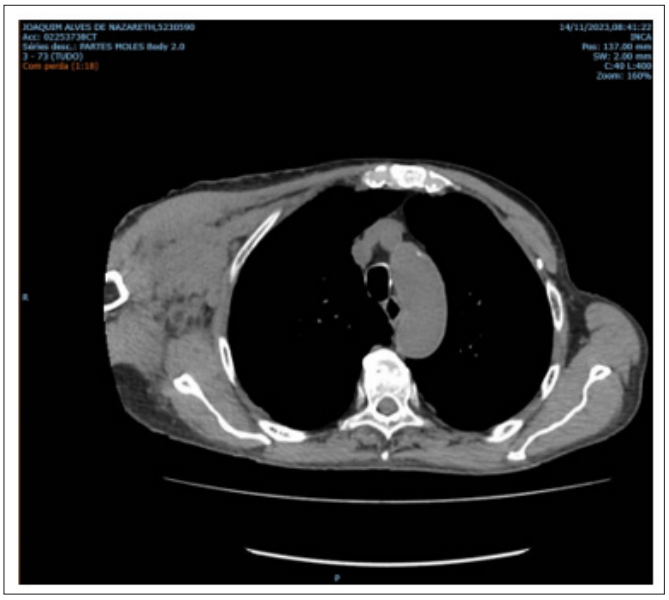

Figure 1: Infiltrative right axillary lymph node enlargement by CT.

Preoperative laboratory tests showed hemoglobin 10.7 g/L, hematocrit 42.3g%, platelets 201,000/mm3, glucose 106mg/dL, urea 64mg/dL, creatinine 0.9mg/dL, sodium 141mmol/L, potassium 4.6mmol/dL and INR of 1.1. The ECG revealed sinus rhythm without alterations. The parameters revealed blood pressure (BP) of 140x73 mmHg, heart rate (HR) of 72bpm, respiratory rate (RR) of 12 and axillary temperature (AT) of 36.5oC.

Pre-anesthetic evaluation: the airway approach was Mallampati I, without any oral or intravenous medication, and the patient was referred to the operating room (OR), and balanced general anesthesia associated with regional blocks was indicated. In the OR, the patient was monitored with cardioscopy, pulse oximetry and non-invasive blood pressure measurement, peripheral venous access with a 16G catheter, and prophylactic administration of amoxicillin with clavulanate (1 g/200 mg), dexamethasone (4 mg) and omeprazole (40 mg), in 50 ml of Ringer's Lactate.

After intravenous sedation with 2 mg of midazolam, interscalene and serratus anterior plane blocks were performed with 20 mL of 0.5% ropivacaine in each block, guided by US and accessed with an A50 needle without complications. After installation of the blocks, preoxygenation was performed with a face mask with a flow of 10 liters of oxygen per minute for 5 minutes, and fentanyl (100 µg), lidocaine (100 mg), propofol (70 mg) and rocuronium (70 mg) were administered. The patient was intubated with an 8.0-gauge wired orotracheal tube under direct visualization by laryngoscopy, classified as Cormack-Lehane grade 1, confirmed by capnography, the tube was fixed, and eye protection was applied, and sevoflurane was started at a concentration of 1.6% to maintain anesthesia. Adjuvants such as magnesium sulfate 2 g, continuous infusion of dexmedetomidine (0.2 to 0.5 µg/kg/h) and intravenous ketamine 10 mg were added. After cardiocirculatory stability, invasive blood pressure was established by catheterization of the left radial artery. At the end of the procedure, dipyrone 3 g and ondansetron 4 mg were administered (Figure 2-5).

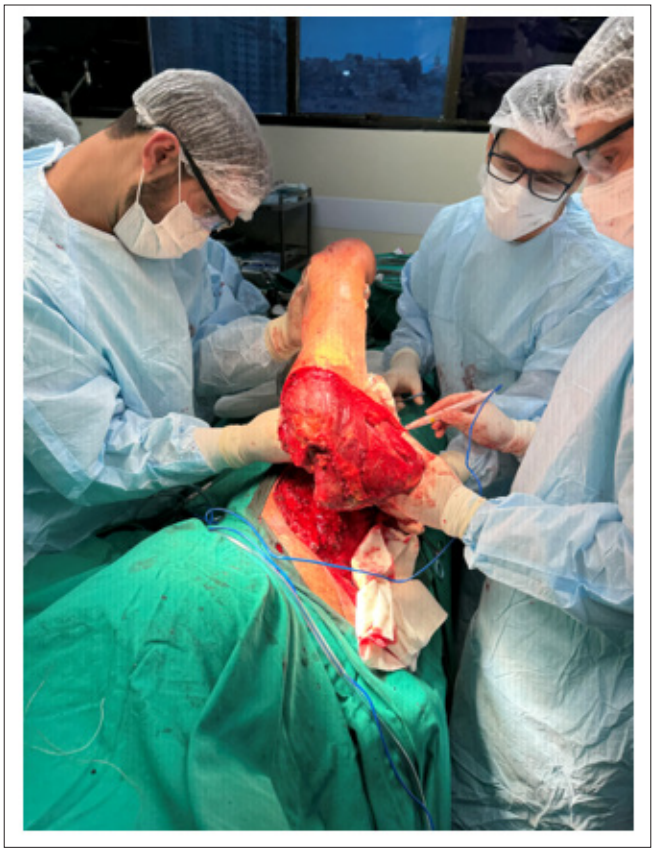

Figure 2: End of Resection of the Right Upper limb.

Figure 3: End of the Surgical Procedure, after TIA.

Figure 4: Part of the right upper limb after TIA.

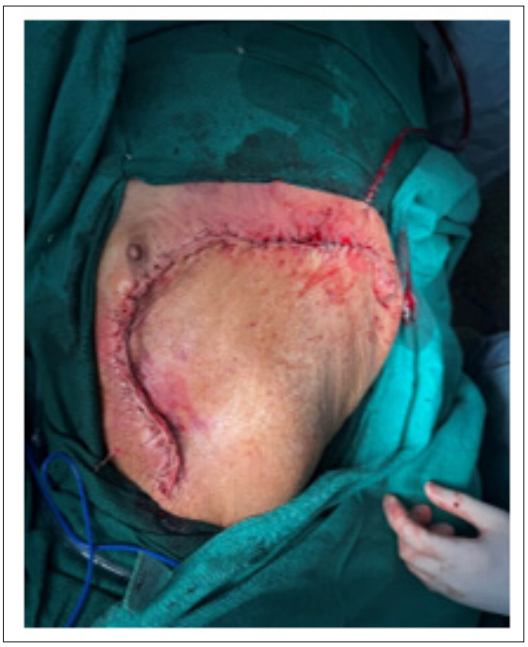

Figure 5: Result final of TIA.

During the surgical procedure, cardiocirculatory stability was observed, with three blood gas analyses, all without significant electrolyte or acid-base alterations, with a hemoglobin of 7.5 g/dL, and a red blood cell transfusion was performed, with a value of 9.5 g/dL at the end of the procedure. The surgery lasted 150 minutes and, at the end, the patient was successfully extubated and transferred to the Post-Anesthesia Care Unit (PACU), with an Aldrete and Kroulik index of 7, and the following parameters: BP of 130x80 mmHg, HR of 75 bpm, RR of 12 bpm and SpO2 of 96% with oxygen enrichment. In the 24 hours following the procedure, the patient reported a score of 2 on the visual analogue scale for pain. The patient was under the care of oncology and physical therapy.

The macroscopic result of the specimen measuring 84 cm in length, with an ulcerated lesion of the skin, hand, fingers and four 2.4 cm lymph nodes. The pathological examination showed moderately differentiated and ulcerated squamous cell carcinoma, with metastatic carcinoma between the four lymph nodes. Pathological staging: pT2 N3b.

Discussion

Skin cancer is the most common of all types of cancer and incorporates a range of pathological entities that originate from different cells of the dermis and epidermis [1]. It is more common in fair-skinned people over the age of 40; however, this age profile has been decreasing with the constant exposure of young people to the sun's rays [1]. SCC begins as a red area with a crusty, scaly surface. As it grows, the tumor may become raised and hard, sometimes with a wart-like surface. The cancer eventually becomes an open sore and grows into the underlying tissue. This clinical evolution occurred with the 85-year-old patient, with light skin color, having been referred to INCA with cancer affecting the entire right upper limb, with involvement of the nodules in the armpit, diagnosis confirmed by biopsy, and the treatment was AIT of the right upper limb, performed under regional anesthesia and multimodal general anesthesia, with success.

Amputation of the affected extremity was considered for many years the standard of care for treating and curing patients with bone and soft tissue sarcomas of the upper and lower limbs. This procedure is now rarely performed because the development of surgical techniques that allow limb-sparing resection and the availability of adjuvant modalities (neoadjuvant or adjuvant radiotherapy) have resulted in successful local control for most patients, eliminating the need for radical surgery [1]. However, due to the advanced stage of SCC cancer, an amputation of the right upper limb was performed.

Amputation at the shoulder level corresponds to the innervation of C1 to C6, corresponding to the superficial cervical plexus (C1-C4), axillary nerve (C5-C6), suprascapular nerve (C5-C6) and lateral pectoral nerve (C5-C6). The best blocks for this surgery are the interscalene block, superficial cervical plexus block and paravertebral block at T2 level [9]. In the present case, the anesthetic team performed the right interscalene block for interscapulothoracic disarticulation, while the serratus anterior plane block was selected for axillary dissection ipsilateral to the injury. The combination of these blocks provided effective anesthesia associated with multimodal general anesthesia and reduced the need for postoperative opioids and improved postoperative pain control.

Some authors recommend TIA under continuous brachial plexus block via anterior interscalene route associated with sedation with fentanyl and midazolam in usual doses [10]. The blockade was complemented by infiltration of the thoracic surgical site with a mixture of 1% lidocaine and 0.125% bupivacaine (40 ml), used during the creation of the posterior skin flap to overcome the few and fleeting painful reflexes observed at the beginning of this surgical procedure, concluding that the technique allowed the shoulder to be disarticulated safely for the patient and comfortably for the surgical team. In our case, we preferred the combination of regional anesthesia with general anesthesia due to the patient's advanced age and ASA physical status III.

In a multicenter, randomized, double-blind, placebo-controlled trial, the rate of chronic pain after amputation surgery was not significantly improved with perioperative administration of valproic acid [11]. In our case report with multimodal perioperative analgesia and regional anesthetic block, we observed improvements in pain severity.

Effective perioperative pain control is an essential component of surgical recovery [12]. However, inadequate pain control is linked to a number of negative consequences in the immediate postoperative period. Inadequate pain control is associated with a higher incidence of postoperative nausea and vomiting, increased cardiac and pulmonary stress, impaired immune function, delayed wound healing, and increased length of hospital stay [13]. The anesthetic technique used showed the best pain control, without adverse effects in the immediate postoperative period.

Conclusion

Thoracic interscapular-amputation is one of the major ablative surgical procedures that was originally described to treat traumatic injuries of the upper extremity. TIA in an 85-year-old patient, as a primary or palliative procedure, may be justified after a careful holistic evaluation of the case. Tumor resection with wide margins (microscopically negative), with limb amputation, is associated with oncological results that provide a better quality of life. Interscalene brachial plexus block associated with the serratus anterior plane with 0.5% ropivacaine and complemented with multimodal general anesthesia allowed shoulder disarticulation with adequate safety for the patient and comfort for the surgical team, excellent postoperative analgesia and no complications.

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