

Brachial Plexus Neuropraxia in Immediate Postoperative Period After Unilateral Total Mastectomy in a Hospital in Southern Huila: Case Report

Mario German Orozco Sandoval, Felipe Andres Beltran Torres, Laura Cristina Fandiño, Nellyth Julieth España Tobar, Stefany Mejía Buesaquillo, Xsara Camila Rodríguez Cerón, Alejandra Katherine Franco Torres

Department of Anesthesiology and General Surgery, San Antonio de Pitalito Hospital, Pitalito, Colombia

Email address:

justi_0304@hotmail.com (M. G. O. Sandoval)

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Abstract: Gynecomastia is a pathology in which there is an increase of the mammary gland in men, its etiology is varied and imprecise, the incidence ranges between 32 to 36%, the diagnosis is based on anamnesis and physical examination directed to define if it is physiological or requires medical intervention, the therapeutic conduct of choice is surgical treatment consisting of bilateral or unilateral mastectomy as the case may be, like other surgical interventions, breast surgery can give rise to neurological lesions evidenced in the immediate postoperative period, most of which are not related to the surgical act but to the position of the patient during the procedure. Neurological lesions of peripheral nerves refer to a transient dysfunction without structural damage until the permanent loss of the integrity of the peripheral nerve. In relation to the present case the lesions specifically of the brachial plexus correspond to 2/3 of the lesions produced during the perioperative period affecting the sensory and motor innervation for the entire upper limb since it is constituted by the communications that are established between the anterior branches of the spinal nerves; It is a rare event with an incidence that corresponds to less than 1%, it is a phenomenon difficult to identify and prevent due to its multifactorial etiology, however, mechanical factors related to the patient's position during the procedure such as hyperabduction of the upper limb or hyperextension in external rotation of the upper limb are associated as the main risk factors. Its exact incidence is unknown because most of the published cases do not show neurological lesions, thus motivating the report of the present case.

Keywords: Brachial Plexus, Peripheral Nerve Injuries, Brachial Plexus Neuropathies

1. Clinical Case Description

The present clinical case is a 21-year-old male patient, whose only personal history is allergic rhinitis and recreational and occasional use of psychoactive substances.

He came to the general surgery service for outpatient consultation with a clinical picture of two years of evolution consisting of a sensation of mass at the level of the left breast, with progressive increase in size, non-painful and without telorrhea. He attended with a breast ultrasound report which indicated left gynecomastia. Physical examination revealed an enlarged left breast of approximately 4 x 5 cm, hard

consistency, non-painful. It was considered that the patient had left gynecomastia grade II, so it was scheduled for surgical resection by open mastectomy. He was evaluated by the anesthesiology service who classified the patient as ASA 1/6, without predictors of difficult airway.

The patient attends the operating room with no changes in the physical examination as previously described. Patient is monitored and general anesthetic strategy is considered, intravenous induction, first generation laryngeal mask # 4 and balanced anesthetic maintenance; he is positioned in supine decubitus with left upper limb in abduction and extension in external rotation on accessory table, without

requiring vasopressor or inotropics intraoperatively. Left mastectomy is performed periaolar approach procedure of approximately 50 minutes without complications at the operative site.

During the immediate postoperative period (POP) in the postanesthesia care unit (PACU) the patient manifested paresis and paresthesia throughout the left upper limb, hypoesthesia in the territory of C6 and C7 from the lower 1/3 of the arm to the fingers of the hand, predominantly the first 3 in the anterior face; without achieving an immediate recovery; Therefore, the anesthesiologist in charge of the patient was informed and indicated a single dose of complex B and corticosteroid, as there was no improvement, the patient continued to be monitored in the PACU and was reevaluated by the anesthesiology service by the team that arrived on duty without evidence of changes in the physical examination previously described in the clinical history in the immediate POP, so management was indicated with lidocaine infusion at a dose of 2 MG/KG/H until the end of the mixture with an approximate duration of 18 hours, initiation of neuromodulator pregabalin 150mg every 12 hours and short course of aines; In case of suspected neuropraxia with probable involvement of the lateral fascicle, neurosurgical assessment was requested and physical therapy 3 times a day was ordered.

Patient required in-hospital management for 7 days with physical therapy, neuromodulator and corticosteroids, structural lesions of the brachial plexus were ruled out in the MRI report, however, full recovery of the mobility of the left upper limb was not obtained despite its favorable clinical evolution.

It was decided to discharge the patient on an outpatient basis, electromyography was requested and a control appointment was made by general surgery with the respective results.

One month after the procedure, the patient attended a control appointment for outpatient general surgery, showing favorable clinical evolution, achieving pronosupination of both elbow and wrist, flexion of the 5 fingers and opposition of the thumb, although he persisted with weakness of the areas of the territory of the cutaneous muscle nerve and radial nerve, without identifying muscle atrophy of the upper limb. He went to the control appointment with the result of electromyography study that showed axonemyelinic involvement of the left median motor nerve.

2. Discussion

Gynecomastia is the most frequent mammary anomaly in men; the characteristics of the tissue will be variable and will determine the increase in size in this region and most of them occur in the phase of hormonal changes in men, such as adolescence and old age; for this reason it is considered a benign, treatable, non-reversible but correctable condition [1]. Although different grades are classified, the treatment of choice is surgical and although peripheral nerve lesions and the probability of developing chronic pain is linked to any

type of procedure; the development of a brachial plexus lesion is described in radical mastectomy procedures, a procedure performed only in cases of malignant lesions that require a wide resection and the damage is mainly due to tissue retraction [1, 2].

Perioperative peripheral nerve injury (PNI) is a widely known entity studied and in most cases preventable but despite all the measures taken it still occurs, leaving a question mark as to why we continue to witness cases like this; how can we definitively avoid them; is there any possibility or is it a risk inherent to the need to perform a procedure [3, 6, 8]. The ASA in the year 2000 published for the first time the updated report of the working group of the American society of anesthesiology on the prevention of peripheral neuropathies in its last update carried out in 2018 [5], in which clear recommendations are provided to decrease the probability of occurrence of this type of lesions in the intraoperative; in most of the studies recently reviewed in this update most of the PNI 0.04% occurred in patients under general anesthesia; Surgical procedures of cardiac surgery, neurosurgery, orthopedics and general surgery were more related to the occurrence of this type of injury; as for patient-related factors, it was found that patients with hypertension, diabetes and a history of smoking were presented as significant risk factors for the occurrence of perioperative PNI [4, 5, 7, 15].

Regarding the brachial plexus injury presented by the patient, 2 mechanisms of injury are known: stretching and compression; situations that may occur during the procedure since after isolation of the operative site with the surgical fields, the ipsilateral extremity remains under these, blocking the visibility of the extremity and possible changes occurred during surgery. Case reports of reviews, patients undergoing sternotomy in cardiac surgery was the main risk factor related to POP retraction and inflammatory changes, plexus blocks as the second risk factor, situations that were not the case of our patient; On the other hand, the inadequate position of the upper limbs such as hyperabduction and hyperextension, associated with positions on the surgical table such as lithotomy, trendelenburg and barber chair were more frequently associated with the presentation of this entity. For this type of cases, more than 80% of the ASA consultants recommend an abduction no greater than 90° of the upper limbs with the patient in supine decubitus to reduce the risk of the appearance of PNI; more than 90% of the consultants agree that a periodic and systematic revision of the patient should be performed during the surgical procedure [3, 4, 5, 14, 15].

Although multiple mechanisms of PNI lesion have been described, the association between a mechanical insult due to the position added to an ischemic insult, a non-related entity due to hypotension during surgery, has a strong relationship with the development of PNI; sustained intraoperative hypotension (mean arterial pressure <55 mm hg) for only 5 minutes or more was associated with greater cases of PNI compared to those patients who presented an episode of hypotension of less than 5 minutes. And if we add to this the

possible autoimmune causes, we find ourselves with a number of variables specific to the patient, the surgery, the position of which in most cases we could have a certain degree of control, which could lead us to trigger in one way or another the appearance of NIBP [4, 5]. When reviewing the clinical history of the case and the intraoperative anesthetic report, there was no evidence of hypotension episodes, ruling out hypotension as a possible associated cause.

Intraoperative neurological monitoring is currently recommended as a strategy in the prevention of NIBP in procedures of long duration or where the patient is completely isolated from the anesthesiologist as in robotic surgeries; but clearly such a strategy would not be cost-effective for all procedures under general anesthesia [4, 9-13]; but clearly such a strategy, although ideal, would not be profitable, could be the choice for all procedures, even more so if we take into account that in institutions such as ours we do not have this type of monitoring.

3. Conclusion

Therefore, it is recommended to follow the ASA consensus recommendations such as the adequate positioning of the patient and extremities to reduce the risk of mechanical insult; support of the extremities and pressure zones on padded and non-rigid surfaces; verification of the patient's position, extremities and pressure zones routinely during the procedure and maintaining MAP above 55MMHG to reduce the probability of ischemic insult, which associated with the other variables would exponentially increase the probability of NIBP [4, 5].

In the case of this patient it was considered that according to Seddon's classification, he presented a neuropraxia of the brachial plexus of the right upper limb which resolved 3 months after the procedure, obtaining a favorable evolution of his initial picture with recovery of the functionality of the affected upper limb.

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