

Síndrome Dolorosa Pós-Mastectomia. A Magnitude do Problema*

Post-Mastectomy Pain Syndrome. The Magnitude of the Problem

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RESUMO

Couceiro TCM, Menezes TC, Valênça MM - Síndrome Dolorosa Pós-Mastectomia. A Magnitude do Problema.

JUSTIFICATIVA E OBJETIVOS: O câncer de mama é a neoplasia mais frequente em mulheres e o tratamento cirúrgico é indicado na maioria das pacientes. São relatadas complicações relacionadas a esse tratamento, dentre as quais se cita a síndrome dolorosa pós-mastectomia (SDPM), que é uma dor persistente que sucede o procedimento cirúrgico. Apesar da gênese da dor ser multifatorial, a secção do nervo intercostobraquial é a lesão nervosa mais frequentemente diagnosticada. O objetivo deste estudo foi revisar: etiopatogenia, diagnóstico, quadro clínico, fatores agravantes ou atenuantes e os fatores de risco relacionados à síndrome dolorosa pós-mastectomia.

CONTEÚDO: Define a síndrome dolorosa pós-mastectomia e proporciona conhecimento para facilitar o diagnóstico e a prevenção.

CONCLUSÕES: A abordagem das pacientes submetidas a tratamento cirúrgico para o câncer mamário exige um acompanhamento pré e pós-cirúrgico por equipe multidisciplinar. Esta abordagem poderá proporcionar escolha racional da técnica cirúrgica, identificar as pacientes que apresentem fatores de risco, minimizar ou eliminar esses fatores quando possível, diagnosticar o mais precocemente a síndrome dolorosa pós-mastectomia e proporcionar o tratamento adequado visando uma melhor qualidade de vida para essa população específica.

Unitermos: DOR, Crônica: síndrome dolorosa pós-mastectomia; DOR, Pós-operatória.

SUMMARY

Couceiro TCM, Menezes TC, Valênça MM – Post-Mastectomy Pain Syndrome. The Magnitude of the Problem.

BACKGROUND AND OBJECTIVES: Breast cancer is the most frequent neoplastic tumor in women, and surgical treatment is indicated in most patients. Complications related to this treatment, such as post-mastectomy pain syndrome (PMPS), a persistent pain that develops after surgery, have been reported. Although the genesis of the pain is multifactorial, sectioning of the intercostobrachial nerve is the nerve lesion diagnosed more often. The objective of this study was to review the etiopathogeny, diagnosis, presentation, aggravating or attenuating factors, and risk factors related with the post-mastectomy pain syndrome.

CONTENTS: Provides the definition of the post-mastectomy pain syndrome and the knowledge to facilitate its diagnosis and prevention.

CONCLUSIONS: The approach to patients undergoing surgery for breast cancer requires pre- and postoperative follow-up by a multidisciplinary team. This approach can provide a rational choice of surgical technique, identify patients with risk factors, minimize or eliminate risk factors whenever possible, diagnose beforehand the post-mastectomy pain syndrome, and provide adequate treatment to improve the quality of life for this specific patient population.

Keywords: PAIN, Chronic: post-mastectomy pain syndrome; PAIN, Postoperative.

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INTRODUCTION

Breast cancer is the first cause of death in women in the United States, Canada, and Europe ^{1,2}. In Brazil, it represented the most frequent malignant tumor in 2006, with 48,930 new cases and an incidence of 51.7 per 100,000 women. In the Northeast of Brazil, it is estimated an incidence of 27.0 per 100,000 women in 2008. It has been observed that both the incidence and the gross mortality rate have been increasing significantly over the last few decades ^{3,4}.

In most cases, breast cancer is treated surgically, according to the clinical staging at the time of the diagnosis ⁵.

SURGICAL TREATMENT

Surgical treatment of breast cancer encompasses conservative and non-conservative surgeries. Conservative surgical treatment is responsible for more than 40% of the surgeries for breast cancer ⁶, and quadrantectomy, which is the removal of the primary tumor with free margins, is the most common. In some cases, axillary lymphadenectomy through a second incision in the axillary region is necessary. Quadrantectomy with biopsy of the sentinel lymph node, which is less invasive, has been used more recently. In this technique only patients with positive sentinel lymph node biopsy will undergo axillary lymphadenectomy ^{5,7}. Radical mastectomy is the non-conservative technique and it was developed in the 19th century by Halsted ⁵. His surgical technique consisted on the removal of the breast, skin, adipose tissue, pectoralis major and minor muscles, and ipsilateral axillary lymph nodes. In modified radical mastectomy, the pectoralis major muscle is preserved; occasionally, the pectoralis minor muscle is also preserved ⁸.

COMPLICATIONS INHERENT TO THE SURGERY

Despite the efficiency of the surgical treatment of breast cancer, several complications have been reported ⁹. Among them we can mention: lymphedema ¹⁰⁻¹³, infection of the surgical wound ^{14,15}, and chronic postoperative pain ¹⁶⁻¹⁸.

Chronic pain secondary to the surgical procedure can be nociceptive – resulting from damage to muscles and ligaments; and neuropathic – resulting from damaged nerves or dysfunction of the nervous system¹⁹, which has been studied the most, since it is more common and corresponds to the post-mastectomy pain syndrome (PMPS).

THE CONCEPT OF POST-MASTECTOMY PAIN SYNDROME (PMPS)

Persistent pain after mastectomy was first reported in the decade of 1970s by Wood²⁰ and it is defined by the International Association for Study of Pain (IASP) as chronic pain in the anterior aspect of the thorax, axilla, and/or upper half of the arm beginning after mastectomy or quadrantectomy and persisting for more than three months after the surgery²¹. However, for Jung et al.⁷ the literature is not precise when defining chronic pain after the surgical treatment of breast cancer. They distinguish four subtypes of neuropathic pain resulting from surgical procedures for the treatment of breast cancer: 1 – phantom breast pain – painful sensation on the breast that has been removed; 2 – intercostobrachial neuralgia – defined as pain and sensitive changes in the distribution of the intercostobrachial nerve after the surgical treatment of breast cancer with or without axillary lymphadenectomy. Post-mastectomy pain syndrome is included in this subtype of post-mastectomy chronic pain. The risk of nerve damage during the surgery can be similar for radical and conservative surgeries and depends on the anatomical variations of this nerve, both in location and in its ramifications²². Sensorial symptoms vary according to where the nerve was severed. Parede et al.²³ reported that severing the nerve in its origin results more frequently in paresthesia than in pain. Damage of the intercostobrachial nerve has been implicated as the most common cause of this syndrome^{7,23}; 3 – pain secondary to the presence of a neuroma – it includes pain in the surgical scar, thorax, or arm, which is triggered by percussion (Tinel's sign); 4 – pain due to damage to other nerves – it might result from damage or even traction of the medial pectoral, lateral pectoral, thoracodorsal, and long thoracic nerves.

Considering the symptoms of patients who underwent mastectomy or quadrantectomy with axillary emptying and have sustained damage to the intercostobrachial nerve, From²⁴ suggested that the term intercostobrachial neuralgia would be more appropriate for this type of neuropathic pain instead of post-mastectomy pain syndrome.

Pain may begin a few hours, weeks, or months^{20,21,25} after the procedure; however, Jung et al.⁷ only consider the diagnosis of PMPS if symptoms last for at least three months, which agrees with the definition of the IASP.

Post-mastectomy pain syndrome is described as a chronic neuropathic pain^{7,26} in which the neurological exam detects damage of the intercostobrachial nerve^{7,27}. Torresan et al.²⁸ evaluated the nerve damage in PMPS by pin prick stimulation

with a 25 x 7-mm needle in the area innervated by the ipsilateral intercostobrachial nerve (ICBN) and compared the results with the contralateral side. Electroneuromyography is a precise assessment technique to study neurologic changes; however, an electrophysiological technique capable of detecting a lesion in the intercostobrachial nerve has not been developed²⁹.

Pain can result from any surgical procedure in the breast, even in the absence of neoplastic disease, such as breast reduction and augmentation²⁷. However, this syndrome is more commonly associated with radical mastectomy with axillary lymphadenectomy and for this reason it is called PMPS^{20,18,27}. On the other hand, Tashmuth³⁰ states that chronic pain is more common in less invasive surgeries, such as quadrantectomy with axillary lymphadenectomy.

The higher rate of pain is not related with the type of surgery, but to the approach to the axilla³¹⁻³³ where the intercostobrachial nerve due to its proximity can be damaged^{7,34,35}.

IMPORTANCE

The incidence of post-mastectomy pain syndrome is high, ranging from 20 to 50%³⁶⁻³⁹. The presence of pain affects activities of daily life in general. There are reports on pain interfering with driving, taking care of the children, leisure time, and sex, resulting in poor quality of life³⁸. Since the neuropathic component predominates⁷, the use of drugs proven to be effective in the treatment of neuropathic pain can relieve the symptoms of patients with post-mastectomy pain syndrome⁴⁰⁻⁴³.

RISK FACTORS FOR THE DEVELOPEMENT OF PMPS

Risk factors for the development of PMPS can be related to the patient or the surgery itself. Among patient-related factors are: age³⁶, lack of a partner⁴⁴, and the body mass index (BMI)³⁷. As for age, the incidence of PMPS is higher in younger patients^{36,37,45}; this can be explained by the fact that patients with breast cancer younger than 35 years have a worse prognosis, both due to the aggressive nature of the tumor and the high rate of recurrence⁴⁴. Some theories try to explain the reasons for the higher incidence of this syndrome in younger patients: 1) increased nerve sensitivity; 2) nature of the cancer in pre-menopausal women; 3) lower sensitive threshold due to higher anxiety; and 4) greater surgical invasion in axillary dissection⁴⁶.

An elevated BMI was considered by Wallace et al.²⁷ as a risk factor for this syndrome, disagreeing with other authors who did not find any correlation between BMI and PMPS^{18,37}.

Among surgery-related factors we can include: 1) the presence and severity of postoperative pain^{47,48} – greater severity postoperative pain and consumption of analgesics are associated with an increased rate of phantom breast pain or any correlated neuropathic pain⁴⁹⁻⁵¹; 2) type of surgery – radical mastectomy is mentioned by some authors as a ma-

major risk factor when compared with more conservative techniques (quadrantectomy)¹⁸. However, recent studies have demonstrated that this risk factor is associated with axillary lymphadenectomy and not with mastectomy or quadrantectomy⁵².

The morbidity resulting from selective axillary lymphadenectomy (removing just the sentinel lymph node for biopsy) is lower than axillary lymphadenectomy⁵³, which has been confirmed by a multicenter, randomized study with 1,031 patients divided in two groups: one group with 515 patients who underwent selective axillary lymphadenectomy, and the other group with 516 patients who underwent axillary lymphadenectomy. The authors found lower morbidity related with symptoms in the arm reported by the patients who underwent selective axillary lymphadenectomy⁵². This technique is also associated with lower risk of chronic postoperative pain^{33,53}.

For Wallace et al.²⁷, immediate breast reconstruction results in greater prevalence of PMPS, which differ from the results of Cafo et al.⁵⁴ who did not demonstrate significant differences among the different surgical techniques.

Adjuvant radiotherapy has also been identified as a risk factor¹⁸.

ETIOPATHOGENY OF PAIN

The etiopathogeny of PMPS is not clear, but it is believed to be multifactorial³² with a major contribution from nerve lesion during surgery and/or involvement of the nerve by scar tissue^{26,30,34,36}. Nerves commonly affected are those with distribution in the thoracic wall, such as the thoracodorsal, pectoralis medial and lateral, long thoracic, and the intercostobrachial¹²⁷, and injury of this last nerve is the main lesion detected in PMPS^{22,45,55}.

According to Race⁵⁶, the intercostobrachial nerve has the same characteristics of a typical intercostal nerve; it is composed of communicating, collateral, and lateral cutaneous branches^{57,58}. It is a sensitive nerve that crosses the muscles of the thoracic wall, being responsible mainly for the sensitivity of the shoulder and proximal portion of the arm. In the axilla, it is located very close to the lymph nodes and for this reason it is commonly damaged during axillary lymphadenectomy.

Pain cannot be explained only by injury of the intercostobrachial nerve⁵⁹. An anatomical study of the extra-thoracic path of the intercostal nerve by Loukas et al.⁶⁰ detected that the ICBN receives different contributions from the 1st, 2nd, 3rd, and 4th intercostal nerves. Based on those variations, the authors identified eight types of participation of those nerves in the formation of the intercostobrachial nerve⁶⁰. Perhaps those variations might explain the different complaints of pain by patients.

Pimentel et al.¹³⁵, in a study that evaluated patients one year after surgery, which included axillary lymphadenectomy pre-

serving the intercostobrachial nerve, demonstrated that the incidence of pain was lower and preservation of the skin sensitivity was higher^{35,61,62}. On the other hand, Ivanovic et al.⁶³ reported that in patients who underwent lymphadenectomy with preservation of the intercostobrachial nerve, although sensitivity was preserved, the incidence of pain was not reduced.

Development of axillary hematoma described by Blunt⁶⁴, and postoperative radiotherapy described by other authors^{18,66} are possible causes of PMPS. It can be explained by compression of a few nerves by the hematoma⁶⁴ and the nerve damage secondary to radiation and formation of fibrous tissue^{65,66}.

PAIN LOCALIZATION AND CHARACTERISTICS

Pain is located on the same side of the surgery, in the anterior thoracic wall, axilla, or medial aspect of the arm²¹, and it is described as burning or tenderness with paroxysms of lancinating, shock-like pain, and is also described by some women as dysesthesia with different degrees of discomfort³². As for pain severity, it varies from mild to severe^{27,34} and it is intermittent or continuous with periods of worsening and improvement²⁰.

In women who survived treatment of breast cancer, chronic pain can cause mood changes, difficulty at work, reduction of physical activities, and change in the quality of life^{54,65} especially in those women whose pain spreads to other areas of the body⁵⁹.

AGGRAVATING AND ATTENUATING FACTORS

Among the aggravating factors we can mention: movement of the ipsilateral upper limb, elevation or any type of pressure in the arm, and movement of the scapular girdle^{20,26}; those movements can trigger pain when performing simple actions, such as dressing oneself.

Among the attenuating factors are: rest and massage³¹. Improvement of pain with the use of some drugs, such as amitriptyline, venlafaxine, and capsaicin has been reported^{40,42}.

CLINICAL PICTURE

The clinical picture of PMPS depends on the damaged nerve. When the pectoralis medial and lateral nerves are damaged the patient develops paralysis of the pectoralis major muscle and the consequent atrophy of the anterior wall of the thorax, resulting in aesthetic changes. Injury of the long thoracic nerve results in paralysis of the serratus anterior muscle^{57,67}; in this case, the patient reports pain at rest in the shoulder, and the physical exam shows a winging scapula. Injury of the thoracodorsal nerve causes paralysis of the latissimus dorsi muscle, resulting in weakness for adduction and internal rotation of the shoulder⁵⁷. When the intercostobrachial nerve is damaged, patients complain of allodynia, dysesthesias, paresthesias, and anesthesia²⁰.

FINAL CONSIDERATIONS

Considering the high incidence of chronic postoperative pain secondary to the treatment of breast cancer, along with the small number of studies on the subject, this review was necessary to better understand it. Adopting the following preventing measures: 1) anesthetic techniques that attenuate postoperative pain; 2) performing surgical procedures with minimal nerve damage; and 3) strict postoperative follow-up to identify the development of PMPS, can establish therapeutic guidelines to minimize pain and the limitations it causes.

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RESUMEN

Couceiro TCM, Menezes TC, Valênça MM - Síndrome Doloroso Post Mastectomia. La Magnitud del Problema.

JUSTIFICATIVA Y OBJETIVOS: *El cáncer de mama es la neoplasia más frecuente en mujeres y el tratamiento quirúrgico está indicado en la mayoría de las pacientes. Se relatan complicaciones relacionadas con ese tratamiento, entre las cuales tenemos: el síndrome doloroso pos mastectomía (SDPM), que es un dolor persistente y que se da después del procedimiento quirúrgico. A pesar de la génesis del dolor ser una génesis multifactorial, la sección del nervio intercostobraquial es la lesión nerviosa más frecuentemente diagnosticada. El objetivo de este estudio fue revisar la etiopatogenia, el diagnóstico, el cuadro clínico, los factores agravantes o atenuantes y los factores de riesgo relacionados con el síndrome doloroso pos mastectomía.*

CONTENIDO: *Define el síndrome doloroso pos mastectomía y proporciona el conocimiento para facilitar el diagnóstico y su prevención.*

CONCLUSIONES: *El abordaje de las pacientes sometidas a tratamiento quirúrgico para el cáncer de mama, exige un acompañamiento pre y pos quirúrgico por equipo multidisciplinario. Ese abordaje podrá proporcionar una elección racional de la técnica quirúrgica, identificar las pacientes que tengan factores de riesgo, minimizar o eliminar esos factores cuando sea posible, diagnosticar lo más rápidamente que se pueda el síndrome doloroso pos mastectomía y ofrecer el tratamiento adecuado para mejorar la calidad de vida de esa población específica.*