CHRONIC MASTITIS

MÁRIO ALVES DA CRUZ JUNIOR[1]; JOÃO HENRIQUE PAZ DA SILVA RIBEIRO[1], DEBORA ALVES MOUALLEM[1], THALLES EDUARDO RIBEIRO[1], DANIELY SOUSA MACEDO OLIVEIRA[1], MARINA EMILIA DE MATOS MORAES[1], MARÍLIA LEMES SANTOS[2], JUAREZ ANTÔNIO DE SOUSA[1,3]

ABSTRACT

Non-puerperal mastitis is a chronic inflammation of the breast that may or may not be associated with an acute infection. It is a benign and low-recurrence breast condition. There are different types of mastitis, classified as infectious or non-infectious. When infectious, it may have a viral, fungal or bacterial etiology. When non-infectious, it can often be associated with another underlying disease, or still have an unknown etiology. The diagnosis of these mastitis can be made through imaging tests, such as mammography and ultrasonography, in addition to biopsies and other laboratory tests. Despite being a rare process, its diagnosis is important to reduce prolonged morbidity and alleviate the suffering of affected patients. Treatment varies depending on the type of mastitis and may include the use of anti-inflammatories, antibiotics, surgery and even immunosuppressive drugs.

KEYWORDS: MASTITIS, NON-PUERPERAL MASTITIS, CHRONIC INFLAMMATION, BREAST CONDITION

INTRODUCTION

Non-puerperal mastitis is a chronic inflammation, with a considerably slow evolution, which may or may not be preceded by an acute infection. It is identifiable through the appearance of connective tissue rich in macrophages and fibroblasts in the breast parenchyma, in addition to vascular neoformation and exudative phenomena. It is a benign breast entity with low recurrence rate, representing about 1-2% of all symptomatic breast processes [1]. However, it can be a source of prolonged morbidity, and it is important to pay attention to imaging, physical and clinical findings , in order to advance the diagnosis and the most appropriate treatment [1].

Mastitis can be classified into infectious and non-infectious, as described in table 1:

Mastitis	
Infectious	Non-infectious
Recurrent chronic subareolar abscess	Ductal ectasia or periductal mastitis
Bacterial infections	Granulomatous mastitis
• Tuberculosis	Steatonecrosis
• Leprosy	Mondor's disease or superficial phlebitis
• Syphilis	Sarcoidosis
• Atypical mycobacteria	Lupus mastitis
• Gonococcal	Actinic mastitis
• Actinomycosis	Oleogranulomatous mastitis.
• Luetic mastitis	Lymphocytic mastitis
Fungal lesions	Diabetic mastopathy
• Paracoccidioidomycosis	
• Pityriasis	
• Versicolor	
Viral infections	
• Herpes	
Parasitic infections	
• Cysticercosis	
• Filariasis	
Infected sebaceous and epidermal cysts.	

Table 1 - Difference between infectious and non-infectious types of mastitis

MAIN MASTITISES FOR CLINICAL PRACTICE

RECURRENT CHRONIC SUBAREOLAR ABSCESS

Also known as Zuskas disease, it is a chronic inflamma-

1. Universidade Federal de Goiás, Goiânia - GO
2. Maternidade Aristina Cândida
3. Academia Goiana de Medicina

ADDRESS
MARIO ALVES DA CRUZ JUNIOR
1º Avenida, n 586, Setor Leste Universitario
CEP: 74605-120.
E-mail: mario@discente.ufg.br

tory process that affects the central portion of the breast, outside the pregnancy-puerperal period, and may lead to the formation of fistulas. It is more common in people between 30 and 40 years old, with smoking and vitamin A deficiency being important risk factors.

The disease begins with a localized inflammation in a subareolar area, evolving to the formation of small abscesses that drain spontaneously, forming fistulas that heal over time.

This process can be repeated several times, with intervals of months to years. Furthermore, younger patients are more prone to mastalgia, which may precede the development of inflammatory masses, while older patients tend to have less pain associated with palpable masses, possibly due to less acute inflammation and greater presence of fibrosis.

The consistency of secretions also varies between ages, with younger patients having less viscous discharge and older patients having increased viscosity.

Non-puerperal subareolar abscesses often require multiple drainage or surgical procedures, and approximately one third of patients develop fistulas [1].

Figure 1 – Recurrent chronic subareolar abscess. The distended canals can then rupture into the periductal mesenchymal tissue, leading to the formation of a periareolar fistula, with the outflow of secretory material.

Clinical condition

Inflammation with abscess formation in the breast is probably caused by an obstruction of the distal subareolar main ducts due to squamous metaplasia. This obstruction leads to distention of the ducts due to the accumulation of secretions, keratin, and sloughing necrotic cells. Thus, rupture of the ducts in the periductal tissue results in the formation of a fistula, with drainage of cell debris and secretory material. In addition, the presence of a bacterial superinfection in the inflamed and necrotic region can lead to the formation of an abscess, which can communicate with the skin through a fistula (Figures 2 and 3). Subareolar abscess is associated with infections caused by Staphylococcus aureus, S. albus and Streptococcus [1].

Figure 2 – Photograph of woman presenting chronic recurrent subareolar abscess with periareolar fistula.

Figure 3 – Photograph of a woman with a recurrent chronic subareolar abscess with periareolar fistula and reactivation of the infectious process.

Diagnosis

The most frequently described mammographic findings include a mass, either focal or diffuse asymmetry. Lesions range from 1.0 to 5.0 cm (mean 2.0 cm). Ultrasound findings include complex cystic lesions (about 50% of cases) and non-specific heterogeneous hypoechoic masses. In cases of breast abscess, imaging is recommended, possibly followed by a biopsy. The diagnosis of fistula is clinical and is identified by a persistent periareolar flow [1].

Treatment

The most effective treatment for primary or secondary fistulas is surgical excision of the fistula, along with removal of adjacent retroareolar tissue and inflammatory tissues. In turn, pharmacological treatment can also be used, with antibiotics that include anaerobes, such as metronidazole and doxycycline. Therefore, when inflammation is in remission, surgery is recommended to prevent recurrences, including resection of the fistulous tract or, in more severe cases, radical surgery, such as resection of the terminal ductal system (Urban's surgery) and removal of the inflammatory tissue and the fistulous tract, accompanied by antibiotic therapy. Particularly in patients who do not wish to breastfeed, retroareolar cone excision of the main ducts can be performed [1].

Granulomatous mastitis

Chronic granulomatous mastitis is a rare inflammatory condition of unknown cause, characterized by the presence of noncaseating granulomas and microabscesses confined to the mammary lobe. Clinical symptoms and radiological findings can be confused with a neoplasm or acute breast infection, which can lead to a delay in the definitive diagnosis. This condition occurs mainly in young women, aged between 17 and 42 years, who have had a recent history of lactation, and it is even rarer in nulliparous women [2–4].

The etiology is unknown, but there is evidence of factors such as microbiological agents, hormonal effects and immunological changes. Corynebacteria, Gram-positive bacteria found in the epithelial flora, can invade deep into the breast tissue through the ducts, for example. Thus, the condition involves autoimmune reactions, resulting in extravasation of secretions and persistent inflammation of stromal cells [2–4].

Premenopausal women often have clinical symptoms such as a breast mass that is hard and adherent to the skin, in addition to axillary nodules and nipple retraction, which can resemble breast cancer (Figure 4). These symptoms are usually associated with abscesses, inflammation and fistula formation in the mammary duct, affecting the skin of the areola itself [2–4].

Figure 4 - Granulomatous mastitis in the left breast

Diagnosis

Granulomatous lobular mastitis is diagnosed by excisional biopsy or percutaneous core needle biopsy. Pathological findings reveal the presence of non-caseating granulomas in the lobules, with Langhans giant cells, epithelioid and polymorphic histiocytes.

Imaging tests, such as mammography and ultrasound, can show variable characteristics and sometimes suggest malignancy. These tests can detect skin thickening, calcifications, asymmetrical density, single or multiple masses, area of architectural distortion, and hypoechoic nodules.

However, in many cases, these tests do not show specific abnormalities. Furthermore, the presence of diffuse abscess and fistula formation can also be observed [2–4].

Treatment

There is no standardized treatment for granulomatous lobular mastitis. The main options include surgery, drug treatment, or a combination of both. Preferred treatment consists of taking Prednisolone 40 mg daily for four weeks, with doses progressively reduced over the weeks, plus Doxycycline 100 mg every 12 hours for 10 days or Tetracycline 500 mg every 6 hours for two to four weeks.

In cases of persistent large tumors and breast deformities, wide surgical resections may be considered. In some cases, when there is a contraindication for the use of corticosteroids or relapse after discontinuing the corticosteroid, immunosuppressive agents such as methotrexate can be used [2–4].

Ductal ectasia mastitis

Ductal ectasia mastitis, also known as mastitis obliterans, is a benign condition characterized by dilation of the mammary ducts, periductal inflammation, and fibrosis. Its exact cause is still unclear, but studies indicate that stimulation of the squamous epithelium, infections and smoking may be related. It presents symptoms similar to granulomatous lobular mastitis and can be observed through imaging exams. However, mastitis from ductal ectasia is often accompanied by discharge and nipple retraction, and breast masses are usually found in the subareolar region. Symptoms include serous or hemorrhagic papillary effusion and a retroareolar tumor. Some patients may have episodes of acute infection with swelling, redness and fever, in addition to increased local sensitivity and masses or palpable dilated ducts [5,6].

Diagnosis

The pathological characteristics revealed in the biopsy are dilation of the main ducts, diffuse infiltration by plasmocytes, sometimes even foreign body granulomas, which can be found around the ducts and lobules [5,6].

Mammography may show increased bilateral retroareolar density and ultrasonography identifies dilated ducts close to the papilla, with dense content and eventually abscesses (Figures 5-7) [5,6].

Figure 5 – Ductal ectasia – Left breast showing, on ultrasound, dilated ducts close to the papilla.

Figure 6 – Ductal ectasia. Ultrasonography identifies dilated ducts close to the papilla and dense content.

Figure 7 – Ductal ectasia. Ultrasonography identifies dilated ducts close to the papilla and dense content.

Treatment

In mild cases without significant clinical impact, a hands-free observational approach can be adopted. However, in specific cases, the surgical option can be considered, involving the removal of the affected ductal tree (Urban surgery) [5,6].

Luetic Mastitis

Specific infectious disease caused by Treponema pallidum, which manifests itself through primary, secondary and/or tertiary lesions in the breast.

The symptoms of mammary syphilis can vary according to the stage of the disease and can include a variety of skin manifestations, specific lymphadenitis, impairment of the general condition and lesions in the internal organs. In the primary form, it is common to observe a hard chancre located in the nipple-areola complex, due to the inoculation of Treponema through contact with the mouth of an infant with congenital syphilis. In the secondary form, the skin lesions may initially appear as spots and progress to papular and papulosquamous lesions typical of secondary syphilis. In the tertiary form, syphilitic mastitis goes through the three stages of syphilitic gum, with slow-growing hardened nodules that can ulcerate or form fistulas [7].

Diagnosis

The diagnosis is confirmed by the results of serological tests and cytological smears with ulcer borders [7].

Treatment

The treatment is performed with Penicillin G benzathine 2.4 million IU intramuscularly, the dose being repeated in a week [7].

Specific mastitis

The breast can be affected by several specific infections, including tuberculosis, leprosy, syphilis, gonorrhea, atypical mycobacterioses, mycobacterial infection in prostheses (Figure 8), actinomycosis, nocardiosis, cat scratch disease, candidiasis, cryptococcosis, aspergillosis, chromomycosis, blastomycosis and sporotrichosis (Figure 9). Viral infections such as herpes simplex and herpes zoster (Figure 10), in addition to parasitic infections such as myiasis (Figure 11), helminthiasis, filariasis and schistosomiasis mansoni can also occur [7,8].

The most common clinical manifestation is the presence of one or more slowly evolving and painless hardened nodules. Acute and recurrent abscesses with caseous necrosis can be seen in more than 90% of cases and multiple fistulous pathways to the skin. Diffuse thickening and sclerosis of the affected mammary parenchyma can also be observed. Many patients with tuberculous mastitis do not have symptoms such as fever, weight loss, and cytological aspiration, in addition to the fact that the tuberculin skin test and pathological examination can be negative [7,8].

Figure 8 – Mycobacterial infection in a patient undergoing reconstruction with a silicone prosthesis after right mastectomy for the treatment of breast cancer.

Figure 9 – Mammary sporotrichosis in a young woman from a rural area.

Figure 10 - Herpes Zoster in women undergoing treatment for breast cancer.

Figure 11 – Myiasis in the region of the upper medial quadrant of the right breast.

Diagnosis

The diagnosis of tuberculous mastitis, for example, involves the identification of Koch's bacillus through biopsy, Ziehl-Nielsen staining and culture. The molecular PCR test can also be used to detect the bacillus in specific cases. On imaging studies, mammography may show asymmetrical density, fibrogranular tissue, and enlarged axillary lymph nodes. Ultrasound shows solid masses with heterogeneous characteristics, presence of cystic areas and multifocal abscess cavities, in addition to enlarged axillary lymph nodes [7,8].

Treatment

The treatment for each disease must be individualized and specific. In the case of tuberculous mastitis, for example, treatment usually consists of using antituberculosis drugs for six to nine months, and surgical removal of the lesion may be necessary in more severe cases [7,8].

OTHER ENTITIES

Mondor's disease

Characterized by Henri Mondor, the disease is a superficial thrombophlebitis of subcutaneous veins, which can affect other regions such as the penis, neck and cubital fossa. It is rare, self-limiting and benign. The clinical picture presents with acute local mastalgia associated with a palpable cord or linear cutaneous depression, whose skin remains mobile. It may be asymptomatic and not show inflammatory signs [9].

Diagnosis is primarily based on clinical examination, but imaging tests support ruling out other etiologies, such as ultrasonography. In this one, the superficial vein can be found with or without the intraluminal thrombus and without flow on Doppler. The origin of the disease is still unclear, but it may be associated with Virchow's triad factors. In addition, it can be caused by muscle strain, use of tight clothing or even be related to malignant neoplasm [9].

Treatment is essentially symptomatic, given its self-limited character, with the use of anti-inflammatory drugs. In exceptional cases, resection of the affected vein may be considered if the disease does not spontaneously regress [9].

Diabetic mastitis

Associated with poorly controlled diabetes mellitus, di-

abetic mastitis is likely to have an autoimmune character related to the development of antigens in the mammary gland due to hyperglycemia, accumulating lymphocytes and proliferating epithelioid myofibroblasts. It is rare, representing less than 1% of benign breast diseases, but it can affect up to 13% of diabetic patients during the course of their illness. It usually affects premenopausal women, but it can affect men with gynecomastia [10].

It presents as a palpable tumor, with inflammatory symptoms, with recurrent and painless hyperemia, but it can become painful. Histologically there is proliferation of lymphocytes and epithelioid myofibroblasts. Diagnostic images are usually nonspecific and may look like breast carcinoma. At mammography, it appears as an area with radiodense and homogeneous tissue. On the other hand, ultrasonography may show an irregular, hypoechoic nodule with a posterior acoustic shadow. Due to their similarity, neoplasms must be discarded. The therapeutic approach consists of controlling glycemic levels and treating symptoms. The use of antibiotic therapy may be necessary in case of infection [10].

Sarcoidosis

Sarcoidosis is a systemic inflammation that mainly affects people of European or African-American descent, whose etiology is still largely unknown. Characterized by the presence of non-caseating granulomas, it mainly affects the lung parenchyma and lymph nodes, with breast cases being very rare. It is usually self-limited and in most cases resolves within a few months [11].

When it affects the breast, it manifests as a mobile nodule with a hardened consistency, similar to cancer. Mammography and ultrasound findings are nonspecific. Chest radiography may show bilateral hilar adenopathy and pulmonary nodules. The treatment is symptomatic, since in most cases it resolves spontaneously. Anti-inflammatories can be used to control the inflammatory process [11].

Actinic mastitis

Resulting from radiotherapy lesions in the treatment of breast cancer, actinic mastitis is characterized by inflammatory lesions that last for several years. Treatment with radiation progressively affects the intima of the vessels, leading to inflammation that manifests itself with redness, skin edema, pain, hyperemia and increased redness. The approach to actinic mastitis includes the use of nonsteroidal anti-inflammatory drugs for 3 to 5 days and hydration of the affected skin.

Mastitis due to disseminated lupus erythematosus

Systemic lupus erythematosus is an autoimmune disease that affects several organs. Among its multiple manifestations, it can also affect the breast. When this happens, breast inflammation can mimic an infection. It usually affects women in menacme with a previous diagnosis of SLE [12].

As in other cases of chronic mastitis, the presence of firm nodules can mimic breast neoplasms and these should be ruled out by diagnostic imaging and histopathological methods, if necessary. Histologically, there is lymphocytic infiltrate, hyaline adiponecrosis, microcalcifications and lymphoid nodules. On mammography, one can see nodules associated with calcifications, related to steatonecrosis and generally with lymph node enlargement. Ultrasonography demonstrates architectural distortion associated with a hypoechoic nodule with posterior acoustic shadowing [12].

Lupus mastitis is usually accompanied by other characteristic manifestations of the disease. The treatment is clinical related to the control of inflammatory reactions and therapeutic approach of Systemic Lupus Erythematosus [12].

Oleogranulomatous mastitis

Oleogranulomatous mastitis results from the ingestion of a foreign body in the breast in order to increase breast volume, and may occur as a result of the use of liquid paraffin, industrial silicone, gel, beeswax and others.

The foreign body undergoes typical reactions, such as encapsulation and fibrosis. There is an intense inflammatory reaction with pain, hyperemia, edema and breast swelling. Mastitis can evolve with fistulas, abscesses and even necrosis.

Mammography may show high-density fibrous capsule nodules. Ultrasound can identify calcified oil cysts and nodules with parenchymal distortion.

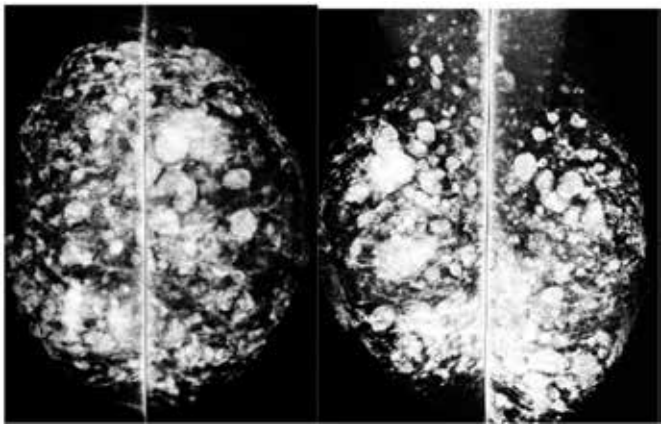

Figure 12 – Mammography. Oleogranulomatous mastitis. Presence of multiple bilateral calcified cysts in a woman who underwent injection of industrial silicone.

CONCLUSION

In conclusion, non-puerperal chronic mastitis can have a very varied etiology and be classified as infectious or non-infectious. In general, it has a benign character and low recurrence. In any case, diagnosis through careful physical examination and complementary exams become even more important to approach the disease properly, due to its rare nature and since mastitis can often mimic a more serious disease, such as neoplasms. In addition, the varied etiologies determine good knowledge so that the case can be approached properly.

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