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SENTINEL LYMPH NODE IN BREAST CANCER: A FIVE YEARS OF EXPERIENCE OF THE PREGNANCY AND GYNECOLOGY CENTER OF THE NATIONAL INSTITUTE OF ONCOLOGY, RABAT

Surgery

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ABSTRACT

Objective: To evatuate/rewiew the sentinel lymph node practice in the service

Patients and methods: it is a descriptive study with retrospective data collection, using exclusively the isotopic method. Patients with tumors less than 5 cm in size, no palpable axillary lymph node, or prior axillary surgery were included. Classified T3, T4 tumors, multifocal and / or multicentric or after neoadjuvant chemotherapy were excluded.

Results: Forty patients met the inclusion criteria. Breast-conserving surgery was the practice mostly associated with sentinel lymph node technique: 35/40 (86%) of the cases. On histological analysis of the tumor, invasive ductal carcinoma prevailed with 36/40, (90%) of cases. The sentinel lymph node was positive to tumor cells in 14/40 patients, ie (35% of cases), the isolated tumor cells were not found on any patient, the micro metastases were found for 1 case (7.1%); on the other hand, macro metastases were diagnosed in 13 patients, ie 92.9% of patients with positive lymph nodes. In patients with positive sentinel lymph node, 4 additional axillary lymph node dissections were performed including 2 patients with 3 positive sentinel lymph nodes and the 2 others with 2 axillary positive node with capsular intrusion. In 10 cases the axillary lymphadenectomy was not performed, among which a case of micro metastasis.

Six cases of axillary negative lymph node benefited from complementary axillary lymph node dissection. In all of these cases, there was no lymph node involvement.

Conclusion: The Sentinel lymph node technique practice at the Breast Surgery Service of the Rabat National Institute of Oncology is a reality although many are still to be done. The Indications need to be enlarged and the techniques to be diversified.

KEYWORDS

Sentinel lymph node, Rabat

INTRODUCTION

Axillary exploration in breast cancer treatment is important to determine lymph node invasion by malignant cells, contributing therefore to the adjuvant treatment strategy [1]. It's an important phase in breast cancer treatment by showing the invaded lymph nodes that will be subsequently removed to prevent local recurrence and generalized metastatic spray of cancer cells therefore increasing survival [1]. Invasive cancer cells can spread through the lymphatic circulation to the nodes. Those more subjected to be invades by breast cancer cells are mainly located in the armpit. The larger the tumor, the greater the risk of node invasion by cancer cells [2].

The management of breast cancer has improved with the sentinel lymph node technique, which is sensitive, with little morbidity [3].

This technique is based on the concept of progressive involvement of the axillary lymph nodes, step by step from the first node directly draining the breast tumor [3]. The hypothesis of sentinel lymph node is based on the fact that the histology of this node reflects the status of the other axillary nodes. If the detected sentinel lymph node is free of cancer cells, the other axillary lymph nodes are also unaffected and axillary lymph node dissection is useless [3].

The recommendations of Saint-Paul de Vence in 2009 had broadened the indications of the sentinel lymph node leading to abstention from axillary lymph node dissection in case of sentinel lymph node free from tumor invasion. Patients with up to 5 cm breast cancer tumor, with a multifocal tumor or an already operated breast and even after neoadjuvant chemotherapy can benefit from the sentinel lymph node technique [4]. The present study was carried out to monitor the five years practice of this activity in the service.

PATIENTS, MATERIAL, AND METHODS

This is a descriptive study with a retrospective data collection that took place from March 5, 2015 to March 5, 2019 at the Gynecology and Breast unit of the National Institute of Oncology in Rabat.

The TC99 isotopic was the unique method used.

This technique consists of surgically locating the first lymph node (s) likely to be invaded by the metastases during the progression of the cancer, after injection into the breast of a radioactive or colored marker [5].

The pathological examination of the axillary node was performed:

In extemporaneous examination with identification of the number and the size of each node, with 2 mm section the macroscopic appearance. At the level of the suspicious slice, a histological section centered on the suspect area of section slices was made. For the non-suspect slice, cytological apposition or histological section and / or standard procedure was carried out.

On standard procedure each lymph node was examined macroscopically, after making a 2mm serial slices sections and standard staining. For microscopic exams, 3 levels separated by 150 microns were performed.

When suspicious cells were found on histology, immunohistochemical examination was performed.

Patients with tumors less than 5 cm in size, with no palpable axillary lymphadenopathy and no past surgical history of axillary surgery were included.

Patients with clinically palpable lymph node, tumors classified as T3, T4, multifocal and / or multicentric, and those with a history of neoadjuvant chemotherapy and /or axillary surgery were excluded.

The variables studied were: the type of intervention associated with sentinel lymph node sampling, the tumor histology, the sentinel lymph node results, and data concerning lymph nodes obtained from axillary lymph node dissection after a sentinel lymph node technique.

RESULTS

Fourty patients met the inclusion criteria. The analysis in Table 1 show that the type of intervention most often associated with the sentinel lymph node technique was conservative treatment and the histological analysis of the tumor predominantly showed infiltrating ductal carcinoma.

The sentinel lymph node was positive in 14 patients (Table 2). The isolated tumor cells were not found in any patient. The micro metastases were found for 1 case (7.1%), and the macro metastases were diagnosed in 13 patients (92.9%) of the positive lymph nodes.

The results of the axillary node sometimes led to axillary lymph node dissection (Table 3). Indeed, in patients with positive sentinel lymph node, 4 complementary axillary lymph node dissections were performed including 2 patients with 3 positive sentinel lymph nodes and the 2 others with 2 axillary positive lymph nodes and capsular rupture. In 10 cases the axillary lymph node dissection was not performed, among which a case of micro metastasis. Some specific cases of negative axillary node benefited from complementary axillary lymphadenectomy. These included 2 patients with repeated surgery for detection failure and 4 patients who had axillary lymphadenectomy for evaluation. In all these cases, the result of axillary lymph node dissection was negative. The detection rate was 95%, with no false negative case.

DISCUSSION

The small number of sentinel node cases in our study can be explained not only by logistic constraints, but also by our inclusion criteria which have been very restrictive, not taking into account the large sentinel lymph node indications [4]. Conservative treatment was the predominant type of surgery in the management of cases associated with sentinel lymph node research technique. Indeed, the incorporation of plastic surgery techniques to breast cancerology has made it possible to further reduction of the indications of mastectomy [6]. The histology of tumors in the majority of cases showed invasive ductal carcinoma, arguing for the relevance of our indications of the sentinel lymph node technique, because breast cancer surgery meets two imperatives: to ensure local control by removing the breast tumor and the axillary lymph node staging [7]. Lymph node invasion remains the main prognostic factor defining the risk of metastasis, therefore justifying the indication of adjuvant therapy [8]. The clinical evaluation of the risk of metastatic axillary lymph nodes lacks some precision. Neither score nor any imaging technique can correct the insufficiencies of the clinical exam [3] .The sentinel lymph node technique is part of the strategies to lessen the burden of surgery [3]. We have used the isotonic method for the detection of the sentinel node because it gives a better frequency of localization than the color technique. With the combination of the two methods it's possible to achieve the highest localization rate and the lowest risk of false negative cases [5]. Some associate with the isotopic method the preoperative lymphoscintigraphy which establishes axillary node mapping, guides surgical procedures and determines the number of lymph nodes to be removed [5]. Other techniques exist, including the magnetic iron detection technique, but it cannot be used alone nowadays due to technological constraints [9]. The point of injection is also to be taken into account. In fact, superficial injection of marker (periareolar, sub-mammary, supra-tumoral) offers greater chance of success than intra-parenchymal injection [5].

Out of the 35% positive sentinel lymph nodes, 92.9% had macrometastases, only 4 axillary lymph node dissections, were performed. In fact, axillary lymph node dissection has been questioned for metastatic lymph nodes not only in the case of micro metastases or isolated tumor cells (ITC), but also in the presence of macro metastases [10]. In assessing the success of the biopsy, the diagnostic accuracy of the biopsy is measured by the frequency of the location of a sentinel lymph node (SLN), and the risk of false negatives [5]. SLN is the frequency at which at least one SLN is surgically located during GS biopsy in a cohort of patients. Localization failure requires cleaning [5]. A false negative corresponds to a negative GS result while the axillary dissection reveals one or more positive GS. The risk of false negatives represents the possibility for a patient whose SLN are negative to have 1 or more axillary nodes affected [5].

Axillary lymph node dissection (ALD) is the gold standard for assessing the diagnostic accuracy of SLN biopsy, and for treating patients in whom SLN is invaded by metastases or for whom SLN biopsy has failed [11].

The lymph node invasion is one of the main parameters for the indication of the adjuvant treatment. Treating affected node reduces the risk of local recurrence. Indeed, cancerous metastases can develop even before the diagnosis of primary cancer can be made. A tumor of less than one gram, clinically silent, is undetectable, even by the most sophisticated medical imaging, but this tumor that contains a few million cells has already been able to produce metastatic cells that will have produced undetectable micro metastases [12].

The extemporaneous examination of the SLN makes it possible to determine whether or not there is an invasion without waiting for the result of the definitive histological analysis. When the result is negative, the SLN must necessarily be the subject of a final examination on permanent histological section since the false negatives are frequent in the extemporaneous examination [5].

The histological sections are stained and analyzed microscopically for macro metastasis (more than 2 mm tumor) and more rarely for micro metastasis (tumor between 0.2 and less than 2 mm) [13]. The SLN technique is validated by an identification rate (IR) greater than 90% and a false negative rate (FNR) of less than 10% in a neo-adjuvant situation [1]. In the case of SLN after neo-adjuvant chemotherapy (NAC), a case of false-negative corresponds to the risk of leaving metastatic lymph nodes in axilla after surgery and chemotherapy [1]. There are variations in the biopsy results of SLN and sometimes they are due to the many variations in technical protocols or team experience. Although the concept of SLN is simple, its realization is complex and challenging. The intervention requires a team consisting of specialists in nuclear medicine, surgery and pathology, and is mastered only after a long period of learning [14].

In all cases where the search for the sentinel node was negative, the examination of axillary node obtained from lymphadenectomy was negative. This is consistent with assertions in the literature that if sentinel lymph nodes are not histologically invaded, axillary lymph node dissection should not be performed because the risk of having an axillary node invaded while the sentinel node is healthy is negligible (inferior at 5%) [14].

Sentinel lymph node search yields more positive results in patients with vascular emboli, histologic grade SBR3 and when the mean age was around 48.3 years. The predictive factors for the risk of non-sentinel lymph node involvement were: the size of the primary tumor, the size of metastasis in the sentinel lymph node [15], the number of invaded lymph nodes removed [16], and the capsular rupture of the invaded SLN [17].

CONCLUSION

The practice of Sentinel Lymph Node technique at the Gynecology and Breast Unit at the National Institute of Oncology in Rabat, although slow, is a reality. Indications needed to be expanded and techniques diversified. To better contribute to lessen the burden of breast surgery, the learning curve had to be established to popularize its practice.

Table 1: Types of surgery and tumor histology

	N=40	%
Types of surgery		
Conservative treatment	35	86
Mastectomy	2	5
Second surgery on tumor site	3	9
Tumor histology		
Invasive ductal carcinoma	36	90
Intra-ductal carcinoma	3	7,5
Invasive lobular carcinoma	1	2,5

Table 2: Result of sentinel lymph node research

	N= 40	%
Negative sentinel lymph node	26	65
Positive sentinel lymph node	14	35
1 positive node	9	22,5
2 positive node	3	10
3 positive node	2	2,5

Table 3: Results of axillary lymphadenectomy

	Nombre	Pourcentage
Positive sentinel lymph node	n =14	100
Complementary axillary lymph node dissection	4	28,6
• Negative result	3	21,4
• Positive result	1	7,1
Lymphadenectomy not done	10	71,4
Negative Sentinel lymph node	n =26	100
Complementary axillary lymph node dissection	6	23
• Negative result	6	23
• Positive result	0	0
Axillary lymph node dissection not done	20	77

Table 4: Predictive factors of positive sentinel lymph node

	Positive sentinel lymph node n=14	Negative sentinel lymph node n=26
Mean age (years)	48,3	46,6
Mean tumor size (cm)	2,8	2,3
Grade SBR 3 (%)	71,4	50
Positive hormonal receptors	71,4	80,7
HER 2	40,3	55,9
Presence of vascular emboli	14,3	3,8

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