

Original Article

Selective sentinel lymph node biopsy in male breast cancer[☆]J.J. Martín-Marcuatu^{a,*}, R.M. Álvarez-Pérez^a, J.M. Sousa Vaquero^b, J.M. Jiménez-Hoyuela García^a^a Servicio de Medicina Nuclear, Hospital Universitario Virgen del Rocío, Sevilla, Spain^b Servicio de Ginecología y Obstetricia, Hospital Universitario Virgen del Rocío, Sevilla, Spain

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ABSTRACT

Objective: To evaluate the reproducibility of the sentinel lymph node (SLN) technique in male breast cancer.**Material and methods:** We retrospectively analyzed 21 male patients diagnosed with breast cancer in our hospital from 2008 to 2016 with, at least, 18 months follow-up. Fifteen patients underwent selective sentinel lymph node biopsy (SLNB) following the usual protocols with peritumoral injection of 18.5–111 MBq of ^{99m}Tc-nanocoloides and acquisition of planar images 2 h after the injection. In 2 cases it was necessary to perform a SPECT/CT to locate the SLN. Immunohistochemistry and molecular techniques (OSNA) were used for their analysis. Six patients did not undergo SLNB because they had pathological nodes or distant disease at the time of diagnosis.**Results:** SLNB was performed in 15 patients. The SLN was negative in 6 patients and positive in the remaining 9. Three patients with positive SLNB did not need axillary lymphadenectomy because of the low number of copies by molecular analysis OSNA. Axillary lymphadenectomy was performed in the remaining 6 patients with the result of 4 positive axillary lymphadenectomies and 2 that did not show further extension of the disease.**Conclusions:** According to our experience, SLNB in males is a reproducible, useful, safe and reliable technique which avoids unnecessary axillary lymphadenectomy and prevents the appearance of undesirable effects.

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Biopsia selectiva del ganglio centinela en el cáncer de mama del varón

RESUMEN

Objetivo: Evaluar la reproductibilidad de la técnica del ganglio centinela (GC) en el cáncer de mama en el varón.**Material y métodos:** Analizamos retrospectivamente a 21 pacientes varones diagnosticados de cáncer de mama en nuestro hospital desde 2008 hasta 2016, con un seguimiento de al menos 18 meses. A 15 pacientes se les realizó la biopsia selectiva de ganglio centinela (BSGC) siguiendo los protocolos habituales con inyección de 74-111 MBq de ^{99m}Tc-nanocoloides peritumoral y adquisición de imágenes planares a las 2 h. En 2 casos fue necesaria la realización de SPECT/TC para la localización del GC. Para su análisis se usaron técnicas anatomopatológicas de inmunohistoquímica o técnicas moleculares (OSNA). Seis pacientes no se sometieron a la BSGC por presentar ganglios patológicos o enfermedad a distancia en el momento del diagnóstico.**Resultados:** La BSGC se practicó en 15 pacientes. El GC fue negativo en 6 de estos, siendo positivo en los 9 restantes. Hubo 3 pacientes con BSGC positiva, pero dado el bajo número de copias de ADN (OSNA) no se realizó linfadenectomía axilar. Sí se llevó a cabo vaciamiento axilar en los 6 pacientes restantes, con resultado de 4 vaciamentos positivos y 2 que no mostraban extensión de la enfermedad.**Conclusiones:** Según nuestra experiencia, la BSGC en los varones es una técnica reproducible, útil, segura y fiable, que evita la realización de linfadenectomías axilares innecesarias y previene la aparición de efectos no deseados.

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* Corresponding author.

E-mail address: jjmarcuatu@gmail.com (J.J. Martín-Marcuatu).

Introduction

Breast cancer in men is infrequent, accounting for 1% of cancers in men. According to data from the SEER review (Surveillance, Epidemiology and End Result),¹ incidence has increased in recent decades, although it accounts for less than 1% of all breast cancers diagnosed. In the United States it is estimated that in 2017 there will be 2470 new cases and 460 men will die as a result of breast cancer.

In the absence of a social awareness as occurs in breast cancer in women, this type of neoplasia lacks a proper screening technique for early diagnosis, so it is detected in more advanced stages with greater likelihood of the lymph nodes being affected, and therefore further extension.

In women, the status of axillary lymph nodes is one of the most important prognostic variables in breast cancer. Axillary lymphadenectomy (LA) has until recently been the gold standard in initial staging. However, LA is not exempt from complications, among which are: the appearance of lymphedema, neurovascular lesions, local healing problems or reduced mobility of the operated arm. On the other hand, the performance of a selective sentinel lymph node biopsy (SSLB) has been shown to reduce the morbidities associated with LA and has been incorporated into the diagnostic–therapeutic algorithm in women’s breast cancer at the earliest stages.^{2,3} Correct lymph node staging is essential in order to minimize the comorbidities associated with the treatment.⁴

The introduction of the one-step nucleic acid amplification (OSNA) method, a highly specific qualitative and quantitative procedure, allows an intraoperative analysis of the sentinel node (SLN) accurately, thus avoiding subsequent interventions. This technique determines with greater precision and accuracy the lymph nodes that may be affected as well as having a high negative predictive value.^{5–7}

In men, LA was the technique of choice until 1999, when SSLB was used for the first time.⁸ There is little experience in the technique and the published series are not numerous. With this article we want to put forward our experience since it is currently the procedure of choice for the staging of breast cancer and allows for selection of patients in whom LA would provide additional benefit.

Material and methods

We retrospectively reviewed 21 men who presented an average age of 76.3 years at the time of diagnosis of breast cancer between 2008 and February 2016. Eighteen patients attended the consultation when presenting a breast nodule (Fig. 1), 12 of them retroareolar. The rest of the patients attended the consultation with nipple discharge and/or nipple retraction. All the patients underwent different imaging techniques (mammography, ultrasound and/or MRI) and pathological anatomy tests (puncture-aspiration with a fine needle or a thick-needle biopsy) to establish the diagnosis. All patients underwent an axillary ultrasound to rule out involvement of the axillary lymph nodes. In this way, 4 patients (19%) with disease extension to axillary lymph nodes who underwent LA were directly detected and 2 (9.5%) had distant metastases, so they received initial chemotherapy (Tables 1–3).

For the detection of SLN, between 37 and 111 MBq of ^{99m}Tc nanocolloid were injected, with 4 syringes at positions 0, 90, 100 and 270 with respect to the tumour centre.⁹ Two hours post administration of the radiotracer anterior, oblique-anterior, and lateral aspect planar images were taken at 180 s/image (Fig. 2). In



Fig. 1. Right mammary tumour. Most frequent form of presentation of breast cancer in men.

2 cases, when the SLN was not visualized in the planar images, a chest SPECT/CT was performed in a Symbia-T6 gamma camera with the arms up using low dose CT of 50 mA, 110 kV, slices of 5 mm (Figs. 3 and 4). We used a 128 × 128 matrix, with zoom 1, a total of 32 images with an acquisition time of 20 s/image. The processing was performed with 3D flash iterative reconstruction, 8 iterations/4 subsets, Gaussian filter 8.4 with a pixel size of 4.8 × 4.8 mm.

After the location of SLNs in the images, they were marked on the skin with a waterproof permanent marker for subsequent location in the operating room.

10–15 min before starting surgery, under general anaesthesia patients received a periareolar injection of 2.6 ml of methylene blue and massage to facilitate drainage of the dye. In the absence of contraindications, the mixed technique was used in all patients since the combination improves the intraoperative identification rate (96.6–100%).^{10,11}

During the intervention, the SLN or the SLNs that had the most activity were extracted, always leaving a background of 10% less than the highest peak of activity. All the lymph nodes were sent to the department of Pathological Anatomy for OSNA molecular analysis.

Results

A total of 15 patients underwent SSLB with a detection rate of 100%, being negative in 6 of these cases. The other 9 men were found to be N+ and an LA was performed on 6 of them, while the other 3 who had positive SSLB (33%) did not undergo LA, because they were low risk patients because they had less of 6000 copies of CK19-mRNA in molecular analysis with OSNA, a technique with a high negative predictive value. All the lymph nodes analyzed were found in the axillary chain, no extra-axillary SLN.

Table 1
Characteristics of SSLB– patients.

Age	Type	Localization	Size (mm)	Stage	Lymph nodes		Intervention	ER (%)	PR (%)	Ki67 (%)	Her2	GRADE
					Positive	Total						
84	IDC	UEQ	20	IA	0	2	SM	90–100	90–100	10	N	2 (3+2+2)
58	IDC	RA	22	IIA	0	2	SM	80–90	80–90	10–20	2	2 (3+2+2)
65	Micropapillary	RA	9	IB	0	3	SM	60–70	40–50	<15	1	2 (3+3+1)
69	NST	ULQ	4	IA	0	4	T	90–100	80–90	10–15	N	2 (2+2+3)
57	Papillary	UEQ	17	IA	0	1	RM	90–100	90–100	10–15	N	2 (2+2+2)
74	NST	RA	12	IA	0	1	SM	70–80	90–100	20–30	N	2 (2+2+2)

ER: oestrogen receptors; IDC: infiltrating ductal carcinoma; NST: invasive carcinoma of no special type; PR: progesterone receptors; RA: retroareolar region; RM: radical mastectomy; SM: simple mastectomy; SSLB: selective sentinel lymph node biopsy; T: tumerectomy; UCE: union of external quadrants; UEQ: upper external quadrant; ULQ: union of lower quadrants.

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