Results of Micro Biopsy (Tru-Cut) of Breast Cancer in Guinea

Bah Malick, Touré Alhassane Isamael, Keita Mamady, Conde Ibrahima Kalil, Souare Mamadou Bobo, Sy Savané Mariame, Cisse Kalil, Cissé Mohamed Falilou, Traore Bangaly

Oncology Department, Donka National Hospital, Conakry University Hospital, Conakry, Guinea

Email address:

lickmadem@yahoo.fr (Bah Malick)

Abstract: *Objective*: The aim was to determine the contribution of Micro-biopsy to the diagnosis of patients with breast cancer. *Material and methods*: This was a 2-year retrospective observational study from January 1, 2019, to December 31, 2020. It concerned patients with breast pathologies who underwent Micro-biopsy. *Results*: We enrolled 360 patients with breast pathologies, 47 of whom underwent Micro-biopsy. The mean age of the patients was 43.0 years, with a predominance of females in 45 (95.7%) cases. The primary tumor was classified as T4 in 24 (51.2%) cases. Micro-biopsy yielded an average of 4 cores (4 and 10). Immunohistochemistry was performed abroad (cerba laboratory) in 40 (85.1%) patients. Hormone receptors were positive in 09 patients, including 6 (2.6%) with positive estrogen receptors and 3 (1.3%) with positive progesterone receptors. Her2-positive breast cancers accounted for 3 (1.3%) cases. The Ki67 proliferation index was ≥ 15% in 24 (40.4%) cases. According to the nature of the fine-needle biopsy specimen result, we notified 39 (83.0%) cases of cancer and 7 (15.0%) cases of benign tumor. *Conclusion*: This preliminary study enabled us to assess the contribution and reliability of Micro-biopsy in the diagnostic arsenal of breast cancer. Micro-biopsy should be performed for all breast nodules. Screening and awareness campaigns will make a considerable contribution to reducing the delay in diagnosis and the morbidity and mortality associated with breast cancer.

Keywords: Micro-Biopsy, Breast Cancer, Guinea

1. Introduction

In 2020, breast cancer ranked 1st in incidence, with around 2.3 million new cases, and was the fifth leading cause of cancer mortality in the world, with 685,000 deaths. [1]. In Africa, the frequency of locally advanced inflammatory forms and ulcerated breasts is higher, varying between 51% and 85.2%. [2, 3]. In Guinea, the incidence of breast cancer is increasing, rising from 605 new cases in 2018 to 739 in 2020 [4, 5]. Sampling methods for diagnosing breast cancer have improved considerably over time; while for ulcerated breast cancers, biopsies using a scalpel are recommended, more and more biopsies are being carried out using a fine needle for non-ulcerated breast tumours. [6]. Percutaneous needle biopsy has the potential to provide a preoperative diagnosis of breast cancer and includes fine needle aspiration cytology and core needle biopsy [6-9]. Fine needle aspiration cytology is in decline and is being replaced by core needle biopsy [10, 11].

In Guinea, the oncology department of the Donka national hospital, the only public department specialising in cancer care nationwide, has since 2018 systematically performed microbiopsies on palpable, non-ulcerated breast tumours.

The increasing incidence of breast cancer in our country and the need to improve the quality of diagnostic sampling for these cancers prompted us to carry out this study, which aimed to determine the role of microbiopsy in the diagnosis of patients with breast cancer.

2. Patients and Methods

This was a 2-year retrospective observational study from 1 January 2019 to 31 December 2020. We performed a

comprehensive enrolment of all patients with a palpable breast lump who were followed up and had a Tru-cut biopsy.

The data collected included basic socio-demographic characteristics (age, sex), clinical signs, imaging results, biopsy results (number of fragments removed) and anatomopathology/immunohistochemistry results.

Tru-cut biopsy was performed using a BARD® MAGNUM® automatic biopsy gun (figures 1 and 2). The patient was positioned supine with her arms abducted; the biopsy trocar used was size 12G*10cm. The area to be punctured was infiltrated with 2% xylocaine after clinical identification and mammography. The biopsy was guided by ultrasound for subclinical tumours, and for macroscopic tumours, the lesion was immobilised between the two fingers to allow sampling. The number of cores taken varied from 4 to 10. The cores were immediately fixed in 10% formalin. A dressing was applied after ensuring haemostasis by compression in the event of haemorrhage, which was generally minimal. The anatomopathological examination request form was filled in immediately. All samples and forms were put into the circuit for transport to the anatomopathology laboratory in Conakry or abroad. Samples sent abroad were analysed at the Cerba laboratory, with the possibility of immunohistochemistry.

Figure 1. Biopsy equipment including the automatic gun (9a), the biopsy needle (9b) and the labelled vial of formalin (95c).
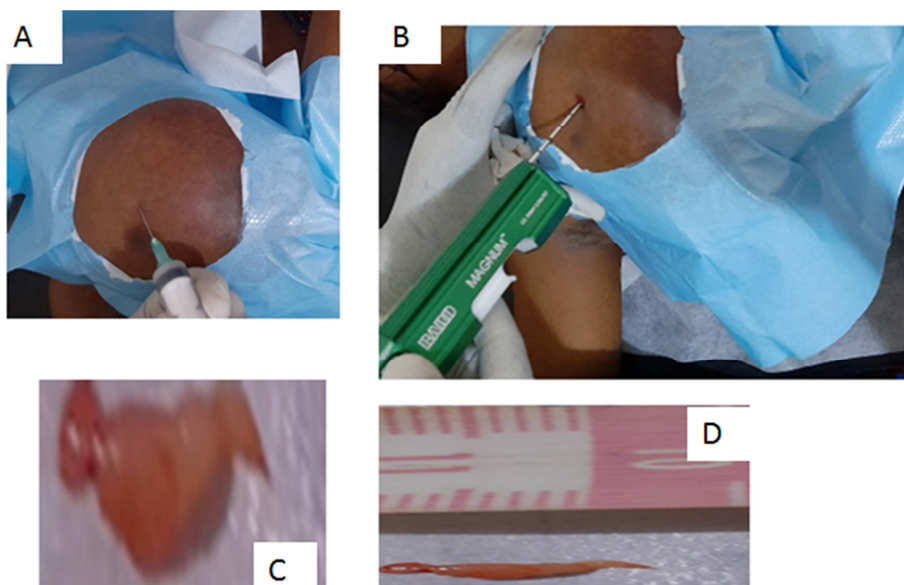

Figure 2. Fine needle biopsy technique and procedure - local anaesthetic (A), _ sampling using the BARD® MAGNUM® with an automatic gun (B), _ core sample (C), core measurement (D).

Data were analysed using SPSS version 21.0 software. Qualitative data are presented as proportions (%), and quantitative data are presented as frequency, median and interquartile range (IQR) or mean (± standard deviation). The $\chi 2$ and Fisher's exact test (for data less than 5) were used, and p-values were considered significant when they were less than or equal to 0.05.

3. Results

In our study, we enrolled 360 patients with breast lesions, 47 of whom underwent fine-needle biopsy.

The average age of the patients was 43.0±13.0 years with extremes of 25 and 80 years. Patients aged ≤ 50 years represented 34 (72.3%) cases. Females accounted for 45 (95.7%) cases. Administrators represented 15 (31.9%) cases, followed by housewives 14 (29.8%) cases and shopkeepers 14 (29.8%) cases. In 38 cases (80.9%), they lived in Conakry and in 9 (19.1%) cases, they came from the interior of the country. The patients were married in 35 (74.5%) cases and widowed in 8 (17.0%) cases.

According to the mode of referral, we notified 2 cases (4.2%) of transfer, 20 cases (12.6%) of referral, 25 cases (53.2%) of consultation three (6.4%) patients had a family history of cancer. Arterial hypertension was found in 10 cases (21.3%), and diabetes and hepatitis B in 8 cases (8.5%) each. Overweight patients numbered 19 (40.4%). They had a WHO 1 index in 35 cases (74.5%). The average consultation time was 11.20 ± 16.16 months (range 1-120 months). The left breast was affected in 27 cases (57.4%).

The nodule or breast mass was palpable in all patients. There was a permeation nodule in 36 (76.6%) cases. The primary tumour was classified as T4 in 24 (51.2%).

Mammography was suspicious in 6 (12.8%) cases and breast ultrasound showed a breast nodule in 11 (23.4%) cases.

Cytopuncture before biopsy was suspicious in 36 (76.6%) cases and not suspicious in 2 (4.3%) cases. Cytopuncture was not performed in 09 (19.1%) cases.

On average, 4 biopsy cores were taken per patient. The extremes were 4 to 10. Pathological examination of the biopsy specimen was performed abroad in 40 (85.1%) cases and Guinea in 7 (14.9%) cases.

Microscopic examination confirmed infiltrating ductal carcinoma in 32 (68.05%) cases and infiltrating lobular carcinoma in 7 (14.89%) cases. The cancer was grade SBR III in 20 cases (42.6%) and SBR II in 14 (29.8%).

Immunohistochemistry was performed abroad (cerba laboratory) for 40 (85.1%) patients. Hormone receptors were positive in 09 patients, including 6 (2.6%) with positive oestrogen receptors and 3 (1.3%) with positive progesterone receptors. Her2-positive breast cancer accounted for 3 (1.3%) cases. The Ki 67 proliferation index was ≥ 15% in 24 (40.4%) cases.

The most predominant molecular subtype was triple negative in 18 (38.3%) cases.

According to the nature of the biopsy specimen, we reported 39 (83.0%) cases of cancer and 7 (15.0%) cases of benign tumour (Table 1). Analysis of the surgical specimen confirmed the diagnosis in 47 (100%) cases.

The performance of the Tru-cut biopsy showed a sensitivity of 97.5% and a specificity of 100%; the positive predictive value was 100% and the negative predictive value was 87.5%.

After bivariate analysis, we found that histological type was significantly related to tumour size: *p-Value = 0.007* (Table 2).

Table 1. *Distribution of patients according to anatomopathological characteristics.*

Variables	n	%
Histological type (n=47)		
CCI	32	68,05
CLI*	7	14,89
Hyperplasia	4	10,51
Adenofibroma	1	2,1
Mastosis	1	2,1
Mastitis	1	2,1
RNC*	1	2,1
Hormone receptors (n=09)		
RO positive	6	2,6
Positive PR	3	1,3
HER-2 status (n=3)		
-Overexpressed	3	1,3
Molecular sub-type (n=25)		
Luminal A	1	2,1
Luminal B	2	4,3
Her2 positive	4	8,5
Triple-negative	18	38,3
Ki67 (%) (n=25)		
< 15 %	1	2,1
≥ 15 %	24	40,4

RNC*: Inconclusive result, CCI*: Invasive ductal carcinoma, CLI: Invasive lobular carcinoma.

Table 2. *Distribution of patients by histological type and tumour size in cases of malignant breast tumours.*

Histological type	N	Tumour size				*p-Value*
		T1	T2	T3	T4	
CCI	32	1	2	5	21	*0,007*
CLI*	7	0	0	0	2	

ICC*: Invasive ductal carcinoma, CLI*: Invasive lobular carcinoma.

4. Discussion

In the diagnosis of benign and malignant lesions of the breast, methods of biopsy of palpable or non-palpable lesions are now increasingly used to determine which lesions will require surgery [12]. When cytological examination is insufficient to make a diagnosis, or is unsuitable, as in the case of large lesions (generally over 2 cm) which will undergo neoadjuvant treatment, the method of choice is breast biopsy, generally under ultrasound guidance [13].

Tru-cut biopsy, also known as core needle biopsy, is an integral part of the triple breast cancer assessment, which includes clinical, radiological and pathological evaluation with tru-cut biopsy. The technique is reliable, simple, reproducible and inexpensive, which can be adapted even for low-income patient groups and in developing countries [14,

15]. It is now one of the useful means of obtaining a histopathological diagnosis, is relatively easy and can be performed on an outpatient basis, avoiding unnecessary excisional biopsy [16, 17].

A true-cut biopsy is considered superior to fine-needle aspiration cytology of breast lesions because it provides sufficient tissue for pathologists to make an accurate diagnosis that can guide surgeons and oncologists in devising an appropriate therapeutic strategy for the management of patients with breast masses [15, 18].

It is recommended to use a fully automatic gun, disposable or not, to guarantee a better quality of the sample [19].

We noted a biopsy sensitivity of 97.5% and a specificity of 100%, which is identical to that reported by *SAMANTARAY et* al. [15]. *OLUWASOLA et* al [20] found a sensitivity and specificity of 86% and 71% respectively.

In 1 case (2%) in our series, the analysis was inconclusive, representing a false negative, which necessitated a second biopsy, the analysis of which confirmed breast cancer. Our results are consistent with those of *RIKABI et* al [18] who found that 1.8% of lesions were benign on the initial biopsy, but turned out to be malignant lesions when a repeat biopsy was performed. The most common cause of these falsely reassuring results is a biopsy of inappropriate tissue. This depends on several factors such as the position of the lesion, its size, mobility, the type, size and density of the breast; the experience of the operator, and patient compliance [21].

An insufficient number of samples is also a factor in the failure of solid masses. Insufficient needle calibre also results in fragmented samples. Experts prefer to use larger needles in the evaluation of breast masses because of the propensity of these lesions to develop peripheral desmoplastic reactions. In addition, larger-diameter needles can contain larger volumes of sample tissue [18, 21].

In our study, there was a significant association between histological type and tumour size (*p-value = 0.007*). This could be explained by the fact that all lesions were palpable in our series.

5. Conclusion

Percutaneous sampling is an essential technique in the management of palpable breast lesions, enabling a rapid, cost-effective and accurate diagnosis. Tru-cut needle biopsies have a sensitivity and specificity comparable to excisional biopsies. Diagnostic accuracy can be further improved by the adoption of image-guided biopsies. Consequently, diagnostic surgical biopsy must be used in special situations and is becoming less frequent.

References

[1] Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. CA Cancer J Clin 2021; 71: 209-49. https://doi.org/10.3322/caac.21660.

[2] Zongo N, Windsouri M, Bambara HA, Some OR, Bambara AT, Ouangré E, et al. So-called "historical" necrotic breast cancers: a terrifying actuality in Africa. The case of Burkina Faso. Tropical Medicine and Health 2018; 28: 434-8. https://doi.org/10.1684/mst.2018.0854.

[3] Jedy-Agba E, McCormack V, Adebamowo C, dos-Santos-Silva I. The stage at diagnosis of breast cancer in sub-Saharan Africa: a systematic review and meta-analysis. Lancet Glob Health 2016; 4: e923-35. https://doi.org/10.1016/S2214-109X(16)30259-5.

[4] International Agency for Research on Cancer. Guinea, Source: Globocan 2018. https://gco.iarc.fr/today/data/factsheets/populations/324-guinea-fact-sheets.pdf (accessed September 6, 2020).

[5] International Agency for Research on Cancer. Guinea, Source: Globocan 2020. https://gco.iarc.fr/today/data/factsheets/populations/324-guinea-fact-sheets.pdf (accessed July 6, 2021).

[6] White RR, Halperin TJ, Olson JA, Soo MS, Bentley RC, Seigler HF. Impact of Core-Needle Breast Biopsy on the Surgical Management of Mammographic Abnormalities. Ann Surg 2001; 233: 769-77.

[7] James TA, Mace JL, Virnig BA, Geller BM. Preoperative needle biopsy improves the quality of breast cancer surgery. J Am Coll Surg 2012; 215: 562-8. https://doi.org/10.1016/j.jamcollsurg.2012.05.022.

[8] Łukasiewicz E, Ziemiecka A, Jakubowski W, Vojinovic J, Bogucevska M, Dobruch-Sobczak K. Fine-needle versus core-needle biopsy - which one to choose in preoperative assessment of focal lesions in the breasts? Literature review. J Ultrason 2017; 17: 267-74. https://doi.org/10.15557/JoU.2017.0039.

[9] Wang M, He X, Chang Y, Sun G, Thabane L. A sensitivity and specificity comparison of fine needle aspiration cytology and core needle biopsy in the evaluation of suspicious breast lesions: A systematic review and meta-analysis. The Breast 2017; 31: 157-66. https://doi.org/10.1016/j.breast.2016.11.009.

[10] Nassar A. Core needle biopsy versus fine needle aspiration biopsy in breast-A historical perspective and opportunities in the modern era. Diagnostic Cytopathology 2011; 39: 380-8. https://doi.org/10.1002/dc.21433.

[11] Vimpeli S-M, Saarenmaa I, Huhtala H, Soimakallio S. Wide-needle biopsy versus fine-needle aspiration biopsy in solid breast lesions: comparison of costs and diagnostic value. Acta Radiol 2008; 49: 863-9. https://doi.org/10.1080/02841850802235751.

[12] Ciatto S, Houssami N, Ambrogetti D, Bianchi S, Bonardi R, Brancato B, et al. Accuracy and underestimation of malignancy of breast core needle biopsy: the Florence experience of over 4000 consecutive biopsies. Breast Cancer Res Treat 2007; 101: 291-7. https://doi.org/10.1007/s10549-006-9289-6.

[13] Pagni P, Spunticchia F, Barberi S, Caprio G, Paglicci C. Use of Core Needle Biopsy rather than Fine-Needle Aspiration Cytology in the Diagnostic Approach of Breast Cancer. Case Rep Oncol 2014; 7: 452-8. https://doi.org/10.1159/000365141.

[14] Günes ME. Comparison of the ultrasound-guided tru-cut biopsy with postoperative histopathology results in patients with breast mass. Ann Ital Chir 2018; 89: 30-5.

[15] Samantaray S, Panda N, Besra K, Pattanayak L, Samantara S, Dash S. Utility of Tru-Cut Biopsy of Breast Lesions - An Experience in a Regional Cancer Center of a Developing Country. J Clin Diagn Res 2017; 11: EC36-9. https://doi.org/10.7860/JCDR/2017/23572.9548.

[16] PISTOLESE CA, PERRETTA T, CLARONI G, ANEMONA L, SERVADEI F, COLLURA A, et al. A Prospective Evaluation of Tru-Cut Biopsy and Fine-needle Aspiration Cytology in Male Breast Cancer Detection. In Vivo 2020; 34: 3431-9. https://doi.org/10.21873/invivo.12182.

[17] A. SC, R. RS, R. RH, N. SP, Prasad K. Fine needle aspiration cytology versus trucut biopsy in the diagnosis of breast cancer: a comparative study. Int Surg J 2017; 4: 3718. https://doi.org/10.18203/2349-2902.isj20174893.

[18] Rikabi A, Hussain S. Diagnostic Usefulness of Tru-Cut Biopsy in the Diagnosis of Breast Lesions. Oman Med J 2013; 28: 125-7. https://doi.org/10.5001/omj.2013.32.

[19] Krebs TL, Berg WA, Severson MJ, Magder LS, Goldberg PA, Campassi C, et al. Large-core biopsy guns: comparison for yield of breast tissue. Radiology 1996; 200: 365–8. https://doi.org/10.1148/radiology.200.2.8685327.

[20] Oluwasola AG, Adeoye AO, Afolabi AO, Adeniji-Sofoluwe ATS, Salami A, Ajani MA, et al. Diagnostic accuracy of true-cut biopsy of breast lumps at University College Hospital, Ibadan. Afr J Med Med Sci 2015; 44: 157-62.

[21] Aissa A, Ben Lassoued M, Alouini R. Breast microbiopsy: reliability according to BIRADS. Imagerie de la Femme 2014; 24: 1-13. https://doi.org/10.1016/j.femme.2014.02.001.