

THE RETROSPECTIVE STUDY OF INTERVENTION METHODS IN PATIENTS AFTER SURGICAL THERAPY OF BREAST CANCER

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Abstract

Introduction: In the Slovak Republic, breast cancer is the most common type of oncological disease in women, the leading cause of cancer mortality in all women. In the past 10 years, breast cancer mortality has continued to slowly decrease, the breast cancer incidence in the past 20 years has continued increase, likely due to program of preventive mammography.

The Aim: The aim of this retrospective study was to assess the importance, the position of the interventional methods – core cut biopsy and fine needle aspiration biopsy under ultrasound control in the differential diagnostics of changes after surgical treatment for breast cancer

Patients and Methods: We evaluated examinations of 385 patients with newly diagnosed breast carcinoma after conservative surgical therapy in period between January 2005 and December 2016 from Clinic of Radiology in Trenčín. In all cases was performed ultrasound, mammography 2D and 3D examinations, ultrasound guided biopsy with free hand methods with needle 14, 16 and 20 G.

Results: The major findings as postoperative changes were seromas, hematomas, fat necrosis, skin thickening, inflammatory changes, granulomas, postoperative scars and local tumor recurrence.

Conclusion: The ultrasound guided interventional methods, fine needle aspiration cytology and core cut biopsy are reliable and perfect methods for the differential diagnosis of postoperative changes and the follow up of postoperative changes.

Keywords: Carcinoma of the breast. Surgical treatment. Ultrasound guided biopsy. Core cut biopsy. Fine needle aspiration biopsy.

1 Introduction

In Slovak republic, breast cancer is the most common type of oncological disease in women, the leading cause of cancer mortality in all women. In 2008, 2608 new cases of breast cancer were diagnosed; in 2012 over 2,800 new cases [1-3]. In the past 10 years, breast cancer mortality has continued to slowly decrease, the breast cancer incidence in the past 20 years has continued increase, likely due to program of the preventive mammography.

There are known epigenetical risk factors: dose-specific alcohol effect, oral contraceptives, racial effect and age-specification. They must be regarded together with mammographic density and genetic predisposition [4].

Thanks to the preventive mammogram program, the number of new diagnosed breast cancers increases. Therefore, the number of minimal surgical procedures increases and the number of postoperative changes also increases too [5]. Diagnosis of postoperative changes is very difficult and complicated.

Mammography, breast tomosynthesis, ultrasound imaging, magnetic resonance and biopsy techniques are an important tool in screening and in diagnostics of breast abnormalities [6,7]. After surgical treatment we examined as well as in control during core cut biopsy and fine needle aspiration biopsy of the area with the suspected neoplasma [8].

2 Aim

The aim of our retrospective study was to evaluate examination of women with breast cancer diagnosis after breast conserving surgical therapy and radiation. The goal was to assess the contribution of ultrasound guided intervention methods for detection and characterization of changes after breast surgical conserving therapy and radiation. The basis for correct diagnosis were extension, echogenicity, configuration of lesion, elasticity and vascularity in ultrasound examination and image on mammography.

3 Patients and methods

In period from January 2005 to December 2015 we examined 385 patients after surgical therapy for breast carcinoma. Of them 385 women we found 103 patients with typical and atypical postoperative changes. We performed mammography, breast tomosynthesis, ultrasound, color Doppler examinations and biopsy procedures after ultrasound control for correct differential diagnosis. Range of age was found in the interval from 25 to 82 years. Most of the examined patients were within the range of 40th – 50th year of life.

The examinations were performed with ultrasound device Siemens SG 50 with linear probe 7.5-10 MHz, BK 400 device with linear probe 18 MHz, elastography with ultrasound device B-K 3000, with mammography equipment Nova 3000 and Mammomat, produced by Siemens and digital mammography with tomosynthesis Amulet by FUJI.

All biopsy were performed under ultrasound control with the free hand method, with the use of the needle 14, 16 and 20 G.

4 Results and discussion

In the Table 1 we present the results of the findings of the 103 patients, we showed a lot of varieties – postoperative changes, scars, granulomas, seromas, haematomas, fatt-necrosis, inflammatory changes after radiotherapy, fibrosis and tumor recurrence (Fig.1 – 7). The basis in ultrasound image for correct diagnosis were extension, echogenicity, configuration of lesion, elasticity and vascularity in ultrasound examination and image on mammography [9].

The results of ultrasound guided biopsy; examinations of the solid breast masses for differential diagnosis are given in Table 2. Cytologic examinations for treatment of seroma and haematoma were regular.

Table 1 Types of postoperative changes

Changes	Number	%
Atypical scares	14	13.6
Keloid	2	2.9
Fatt necrosis	5	4.9
Granuloma	2	1.9
Seroma	30	29.1
Haematoma	15	14.6
Tumor recurrence	5	4.9
Fibrosis, RAT	30	29.1
TOTAL	103	100.0

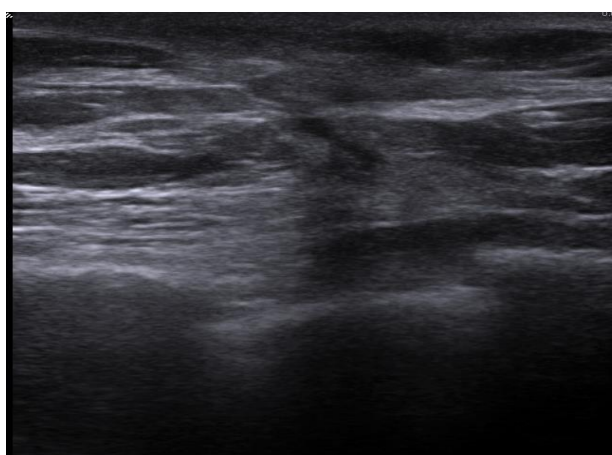
Table 2 Differential diagnosis of solid masses

Type of changes	Number of biopsy	Results (1 / 2)	%
Atypical scares	14	14/14	100.0
Keloid	2	1/2	50.0
Fatt necrosis	5	5/5	100.0
Granuloma	2	1/2	50.0
Tumor recurrence	5	5/5	100.0
Fibrosis	30	24/30	83.3

Legend: 1- number of coincidence histology, 2 - total number of core cut biopsy

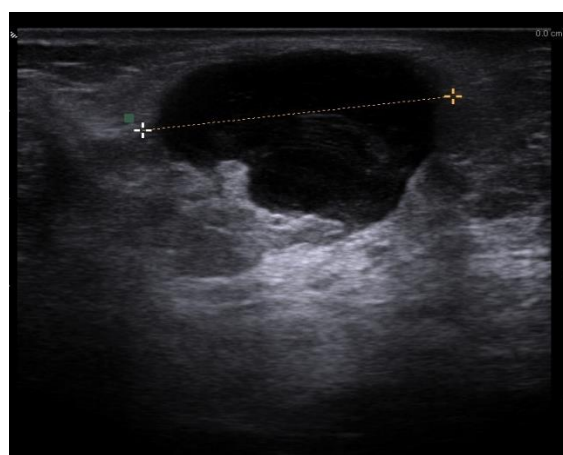
Table 3 Treatment of liquid collections, results of diagnostical and therapeutical effects

Type of changes	Number of biopsy (aspirations)	Th and Dg effects	%
Seroma	30/30	25/30	80.0
Heamatoma	10/15	8/10	80.0
Inflamatory changes	2/30	2/2	100.0



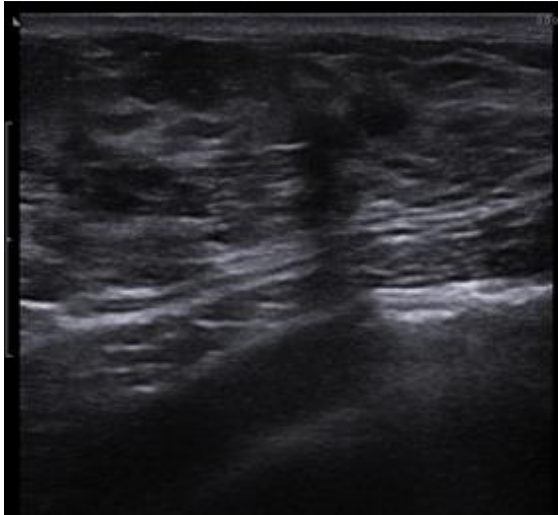
Legend: Patient – 47 years old, right breast, st.p. QE, Histology: Invasive ductal carcinoma, T1, N0, M0, G2

Fig. 1 Sonography findings of the postoperative changes – scars. Typical scar with acoustic shadowing starting at the skin level and interrupting all tissue layers (Source: Clinic of Radiology, Trenčín)



Legend: Patient - 39 years old women, left breast, Histology: Invasive ductal carcinoma, T1, N0, M0, G1

Fig. 2 Typical sonographic image of hematoseromas under scar after quadrantectomy (Source: Clinic of Radiology, Trenčín)



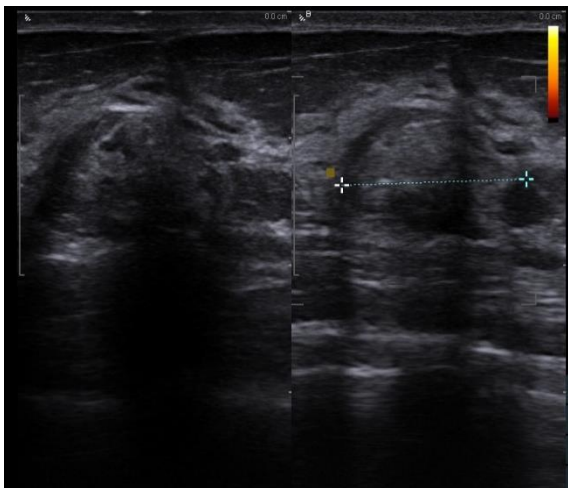
Legend: Patient: 58 years old women, right breast, Hi: Invasive lobular carcinoma, T2, N0, M0, G2. Cytology (FNAB): reparative changes, Histology (core biopsy): keloid

Fig. 3 Sonographic manifestations of atypical scar – hypoechoic, irregularly outlined scar. (Source: Clinic of Radiology, Trenčín)



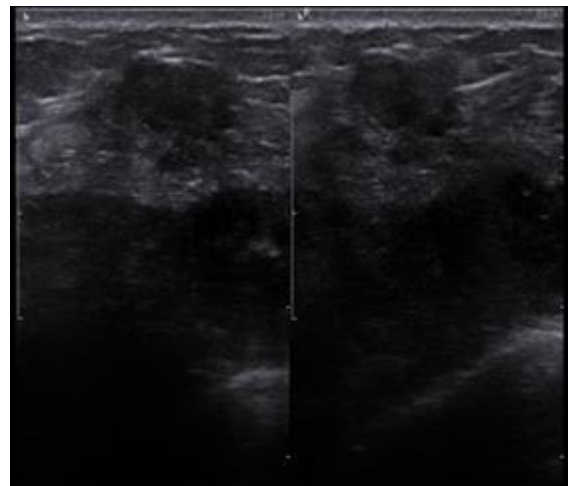
Legend: Patient: 39 years old women, left breast, histology: Adenocarcinoma, T1, N0, M0, G2. Cytology of aspiration (FNAB): seroma

Fig. 5 Sonographic manifestations of seromas. Aspiration of seromas with visualization correct needle positioning before and during aspiration (biopsy) Volume: 18 ml (Source: Clinic of Radiology, Trenčín)



Legend: Patient – 42 years old women, left breast, QE, EA. Histology: Lobular breast carcinoma, T1, N1, M0, G2. Cytology (FNAB): reparative changes. Histology (core cut biopsy): granuloma

Fig. 4 Sonography of the granuloma. A round hypoechoic lesion with combinations with hyperechoic zone (Source: Clinic of Radiology, Trenčín)



Legend: Patient: 47 years old women, histology: Invasive ductal carcinoma of the left breast T2, N1, M0. CCB: local tumor recidive. Histology (definitive, reoperation): tumor recurrence of invasive ductal carcinoma.

Fig. 6 USG image of local recurrence tumor. Typical hypoechoic breast lesion in area under scar after lumpectomy. Inhomogeneous structure, with acoustic shadowing (Source: Clinic of Radiology, Trenčín)

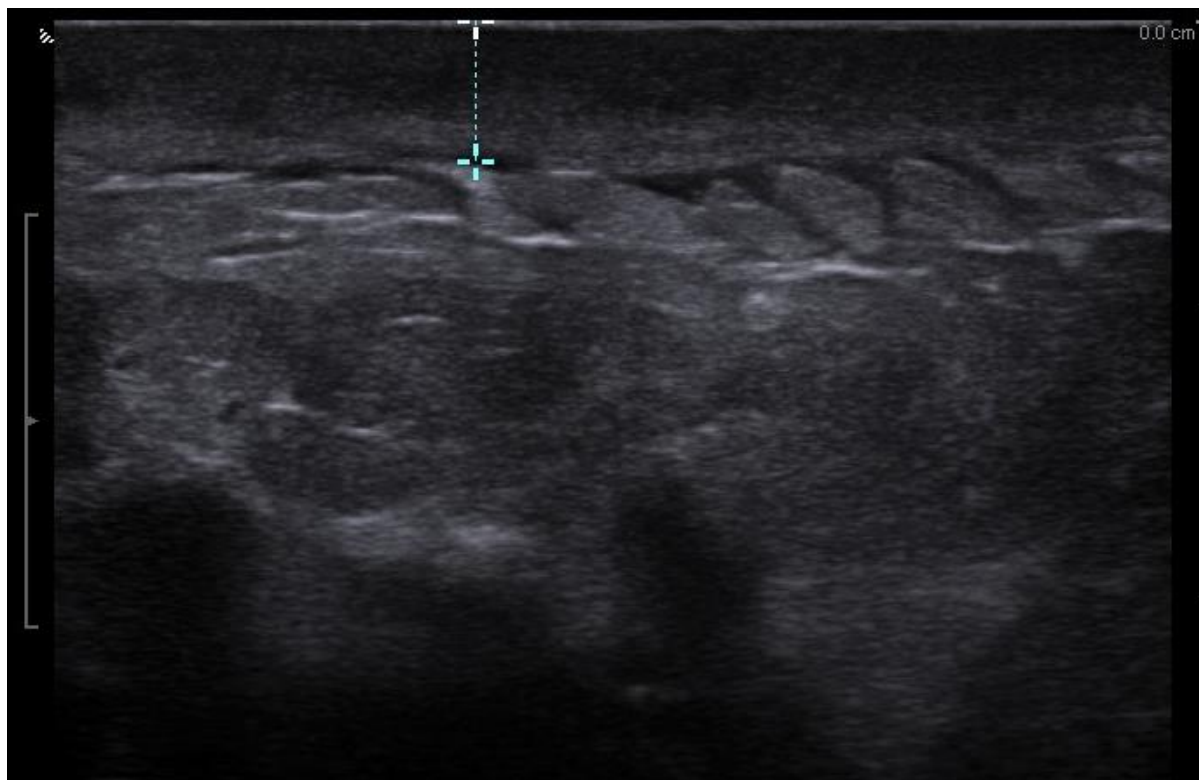


Fig. 7 Sonographic image of the typical changes after radiotherapy (postirradiation inflammatory changes skin and tissue under skin of the breast in acute phasis) (Source: Clinic of Radiology, Trenčín)

5 Discussion

Ultrasound technique can be used in monitoring of disease response to surgical therapy, chemotherapy and radiotherapy [1,10]. Ultrasound and mammography, 2D and 3D – breast tomosynthesis, are necessary for differential diagnosis of the postoperative changes of breast tissues structure after surgery therapy [11,12]. For planning and management of follow-up control mammography and ultrasound examinations after oncology therapy are clinical, imaging (mammography, ultrasound, ultrasound guided procedures, magnetic resonance) and pathology correlation fundamental to collaborative multidisciplinary diagnosis [13,14].

Breast ultrasound and ultrasound guided biopsy has an important role in the detection and follow-up of a lot of type of postoperative changes. Ultrasound imaging technique with linear probe 18 MHz has an excellent sensitivity and specificity, when performed by experienced practitioners within a “triple” assessment context. Reliable application of sonographic criteria of evaluation of lesions must be combined with comprehensive and practitioner knowledge of breast anatomy and breast pathology. The findings of ultrasound examinations of post-operative changes respond to findings in routine ultrasound examinations. We describe echogenicity, number of lesions, fluid collections, pathological vascularization [10]. We compared the results of collections aspirations with lasting effect and, in the event of success, we were successful. We have had the positive therapeutic results of 80 to 100%. We performed core cut biopsy in all cases with suspicion of local tumor recurrence, we were in 100% correct. There are the same results in compare with study by MRI diffusion-weight magnetic resonance [15] (Mansour SM., Behairy. N., 2014). We only had local recurrences in 5 cases out of 138. This is a very good result.

6 Conclusion

In the retrospective study we confirmed, that the ultrasound examination and ultrasound guided biopsy are the reliable methods for differential diagnosis for solid breast masses and for differential diagnosis and treatment for fluid collection and follow-up postoperative time period and during later phases.

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