

Immediate breast reconstruction in pregnancy and lactation

Reconstrução mamária imediata na gestação e na lactação

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Keywords

Breast neoplasms/surgery
Mamoplasty
Pregnancy complications,
neoplastic

ABSTRACT

Introduction: Pregnancy-associated breast cancer (PABC) includes breast cancer diagnosed during pregnancy and within a year after delivery. At least 10% of the patients with breast cancer who are younger than 40 years of age are pregnant at their diagnosis. Although mastectomy is the most frequent indication, there are no data about immediate breast reconstruction, and most authors recommend delayed reconstruction. **Objective:** The purpose of this paper was to present a model that allows immediate breast reconstruction in this complex group of patients, which no compromise neither oncologic treatment nor the fetus evolution. **Methods:** This study was carried out as retrospective and prospective analysis of consecutive PABC patients who had undergone mastectomy, axillary dissection and immediate breast reconstruction in the Breast Unit of Nossa Senhora das Graças Hospital, in Curitiba (PR), Brazil, from March 2004 until July 2008. **Results:** From a total number of 598 cases of invasive breast cancer, 10 PABC cases (1.7%) were selected. These patients were younger and with more aggressive tumors than non-pregnant ones. Breast reconstructions were performed following a specific decision model designed in our Unit. First trimester patient (n=1) was submitted to immediate reconstruction in one-step surgery with breast implants and contra-lateral symmetry. Second and third trimester patients (n=2) were submitted to temporary expanders. Lactation patients (n=5) were submitted to temporary expanders, or one-step surgery with implants in cases of lactation ceased at least three months ago (n=1). No surgical complications or delay in adjuvant therapy were observed. Only one patient needed postoperative radiotherapy, resulting in Baker 2 capsular contracture. **Conclusions:** All the patients were alive without disease in this group, and the fetus evolutions were not compromised by the surgery. This reconstructive approach minimizes the effects of mastectomy. It does not increase the clinical and oncologic risks, nor compromise the fetus.

RESUMO

Introdução: Câncer de mama associado à gestação (CAG) inclui todos aqueles casos diagnosticados durante o período da gestação até aqueles detectados um ano depois, no período da lactação. Até 10% das pacientes diagnosticadas com câncer de mama antes dos 40 anos estão grávidas. Embora a mastectomia seja a indicação mais frequente nesse grupo, não existem dados sobre a reconstrução mamária imediata, e a maioria dos autores indica que se adie a reconstrução. **Objetivo:** O objetivo deste estudo foi apresentar um modelo que permite a reconstrução mamária imediata nesse grupo complexo de pacientes, sem comprometimento para o tratamento oncológico ou para a evolução fetal. **Métodos:** Trata-se de uma série de pacientes consecutivas com CAG, acompanhadas de maneira retrospectiva e prospectiva, e submetidas à mastectomia e reconstrução mamária imediata na Unidade de Mama do Hospital Nossa Senhora das Graças em Curitiba, no período

Descritores

Neoplasias da mama/cirurgia
Mamoplastia
Complicações neoplásicas
na gravidez

Study carried out at Breast Unit of Hospital Nossa Senhora das Graças, Curitiba (PR), Brazil

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Recebido em: 09/07/2010 Aceito em: 20/08/2010

entre Março de 2004 até Julho de 2008. **Resultados:** Entre um total de 598 casos de carcinomas invasivos, 10 (1,7%) CAG foram selecionados para este estudo. Essas pacientes eram mais jovens e com tumores biologicamente mais agressivos do que as pacientes fora do período associado com a gestação. A decisão sobre a reconstrução mamária imediata seguiu um protocolo específico criado dentro da unidade. Uma paciente do primeiro trimestre (n=1) foi submetida à reconstrução mamária imediata com prótese definitiva e simetrização. Duas pacientes do segundo e terceiros trimestres (n=2) foram submetidas à reconstrução mamária imediata com expansores. As pacientes diagnosticadas durante a lactação foram submetidas à reconstrução imediata com expansores temporários (n=5) e uma (n=1), cuja lactação tinha cessado há três meses, foi submetida à reconstrução mamária imediata com prótese definitiva e simetrização imediata. Não foram observadas complicações ou atraso no início do tratamento adjuvante neste grupo de pacientes. Uma paciente necessitou radioterapia no plastrão e apresentou contratura capsular tipo Baker 2. **Conclusões:** Todas as pacientes encontram-se vivas e sem evidência de doença neste grupo, e a evolução fetal não foi comprometida pela cirurgia. Esse modelo de reconstrução mamária imediata não compromete o feto, nem aumenta os riscos clínicos e oncológicos.

INTRODUCTION

The definition of pregnancy-associated breast cancer (PABC) includes breast cancer diagnosed during pregnancy and within a year after pregnancy^{1,2}. Although the prevalence of PABC is relatively low (1:3000 deliveries), it puts the medical team in a complex setting, because two individuals are involved: the mother and the unborn child^{3,4}. It is estimated that 3% of all breast cancers may be diagnosed in pregnant women, and its incidence is expected to increase due to worldwide postpone childbearing. Putting in another way, at least 10% of patients with breast cancer who are younger than 40 years of age are pregnant at their diagnosis^{4,7}.

The management of these young women represents a challenge to all those involved in their care. In contrast to other areas of breast oncology, there are no large randomized trials to guide surgical and clinical practice. Most of treatment recommendations are based on case reports and matched historical cohorts. In consequence of that, until now PABC cannot be helped by a standardized treatment. But the options should be always influenced by the need to give optimal treatment to the mother whilst minimizing risks to the fetus¹⁻⁷.

Surgery is usually the primary therapy and mastectomy the most frequent indication during pregnancy, since most tumors are higher than in non-pregnant patients. Therefore, breast anatomy is completely altered and no data exists about how it can affect the decisions on the best technique to reconstruct the breast in PABC. Consequently, some authors defend that breast reconstruction should be delayed until after delivery and after the end of oncologic treatment, when all reconstructive options can be available.

So, the purpose of this paper was to present a model that allows immediate breast reconstruction in this complex group of patients, which no compromise neither oncologic treatment nor the fetus evolution.

METHODS

Patients

This study was carried out as a retrospective and prospective analysis of consecutive PABC patients who had undergone mastectomy, axillary dissection and immediate breast reconstruction in the Breast Unit of Hospital Nossa Senhora das Graças, in Curitiba (PR), Brazil, from March 2004 until July 2008. From a total number of 598 cases of invasive breast cancer, 10 PABC cases (1.7%) were selected. One PABC patient was excluded since she had a locally advanced breast cancer and was submitted to a radical modified mastectomy without immediate breast reconstruction. Patients' medical records of the Control Group (non-PABC patients) were re-evaluated from a previous data base in detail about the age, tumor size, stage of breast cancer, axillary lymph node status, surgical procedure performed, and histopathology of the excised specimens. The PABC patients were submitted to a protocol (described above) of our Unit and have been followed-up during pregnancy, lactation and postoperative period by a multidisciplinary team.

Surgical procedure

All patients underwent mastectomy. Breast reconstruction was performed following a specific model designed in our Unit, where we divide these patients in three distinct groups:

- first trimester: immediate reconstruction in one-step surgery with breast implants and contra-lateral symmetry with breast reduction or mastopexy; or two-step surgery with temporary expanders (Figure 1);
- second and third-trimester: temporary expanders;
- lactation: temporary expanders or autologous flaps. If the lactation has ceased at least three months ago, it is possible to perform one-step surgery with definitive implant and contra-lateral breast symmetry.

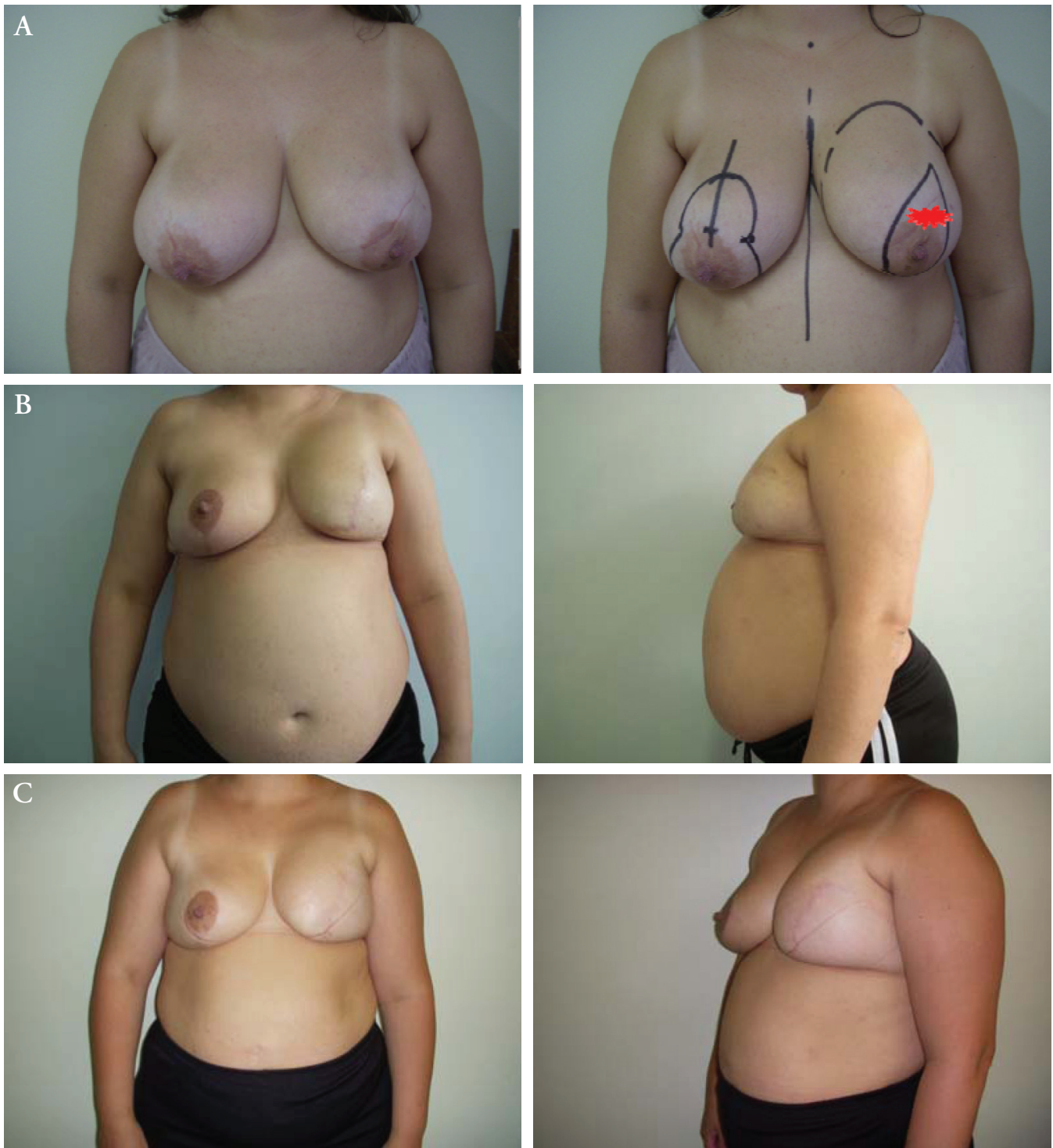


Figure 1. (A) Preoperative view of a 32-year-old with invasive ductal carcinoma in the left breast, pT2N1(1/32), ER/PgR +, HER2-, and 8 weeks of pregnancy; (B) postoperative view 8 months after skin-sparing mastectomy, immediate breast reconstruction with an implant Allergan Style 410 MX 520cc, and contra-lateral breast reduction; (C) postoperative view 9 months after delivery.

Statistics

Results obtained from the two groups (pregnant versus non-pregnant patients with invasive breast cancer) were compared with statistical analysis for significance between variables performed by Fisher's exact test in StatsDirect software.

RESULTS

The mean age of PABC patients was 33 years old (range 29-48 years old). The characteristics of the tumors in pregnant versus non-pregnant group are shown in Table 1. PABC patients were

younger and with statistically significant, biologically more aggressive tumors.

Only one patient was in the first trimester. She was submitted to mastectomy, axillary dissection, and one-step reconstructive surgery with definitive implant and breast reduction. The evolution in this case was without significant modifications in the breast, since the lactation was inhibited, and the reconstructive result was stable over the time (Figure 1).

All the patients in the second (n=2) trimester and in the lactation group (n=6) were submitted to breast reconstruction with temporary expanders. None of them had surgical compli-

cations, or compromise to the fetus. Adjuvant therapy was not delayed in this group. Definitive implants were done together with contra-lateral breast symmetry six months after delivery, or one month after the end of adjuvant therapy (Figure 2). One patient, where the lactation has ceased three months ago, was submitted to one-step reconstructive surgery with definitive implant and contra-lateral breast reduction (Figure 3).

One patient underwent radiotherapy due to compromising of 14 lymph nodes in the axilla (14/28). After adjuvant chemotherapy, the expander was changed by the definitive implant, before the beginning of radiotherapy, as it is the routine in

Table 1. Comparison between pregnant and non-pregnant patients with invasive breast cancer

Characteristic	Pregnant (n=10)	Non-pregnant (n=598)	Statistical analysis
Age	33	56.6	
T2 and T3	90%	20.1%	p=0.0001
ER/PgR+	30%	78.7%	p=0.0008
HER2+	20%	22.4%	p=0.456
Axilla +	80%	15.1%	p=0.0001
Mastectomy	100%	45.8%	p=0.0002

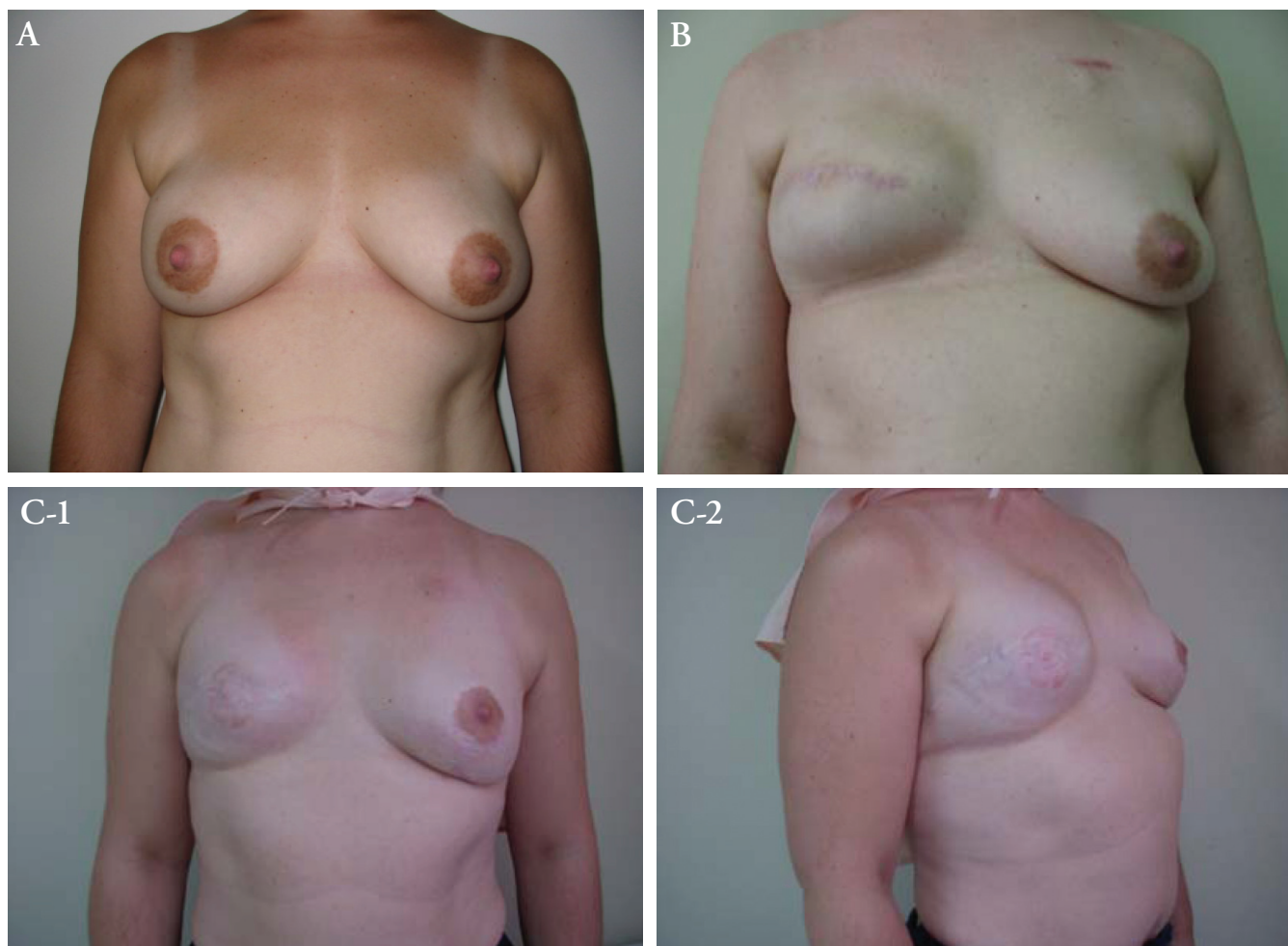


Figure 2. (A) Preoperative view of a 29-year-old woman, invasive ductal carcinoma in the right breast, pT2N0, ER/PgR -, HER2-, lactating; (B) postoperative view after immediate breast reconstruction with temporary expander Allergan Style 133 LV 400cc; (C) Postoperative view with five years of follow-up after change of temporary expander by definitive implant Allergan Style 410 MF 375 cc.

our unit. She had good long-term evolution, presenting with a discrete capsular contracture Baker 2, and there has been no evidence of disease in 18 months of follow-up (Figure 4).

No surgical complications or delay in adjuvant therapy were observed. All the patients were alive without disease in this group, and the fetus evolution was not compromised by the surgery.

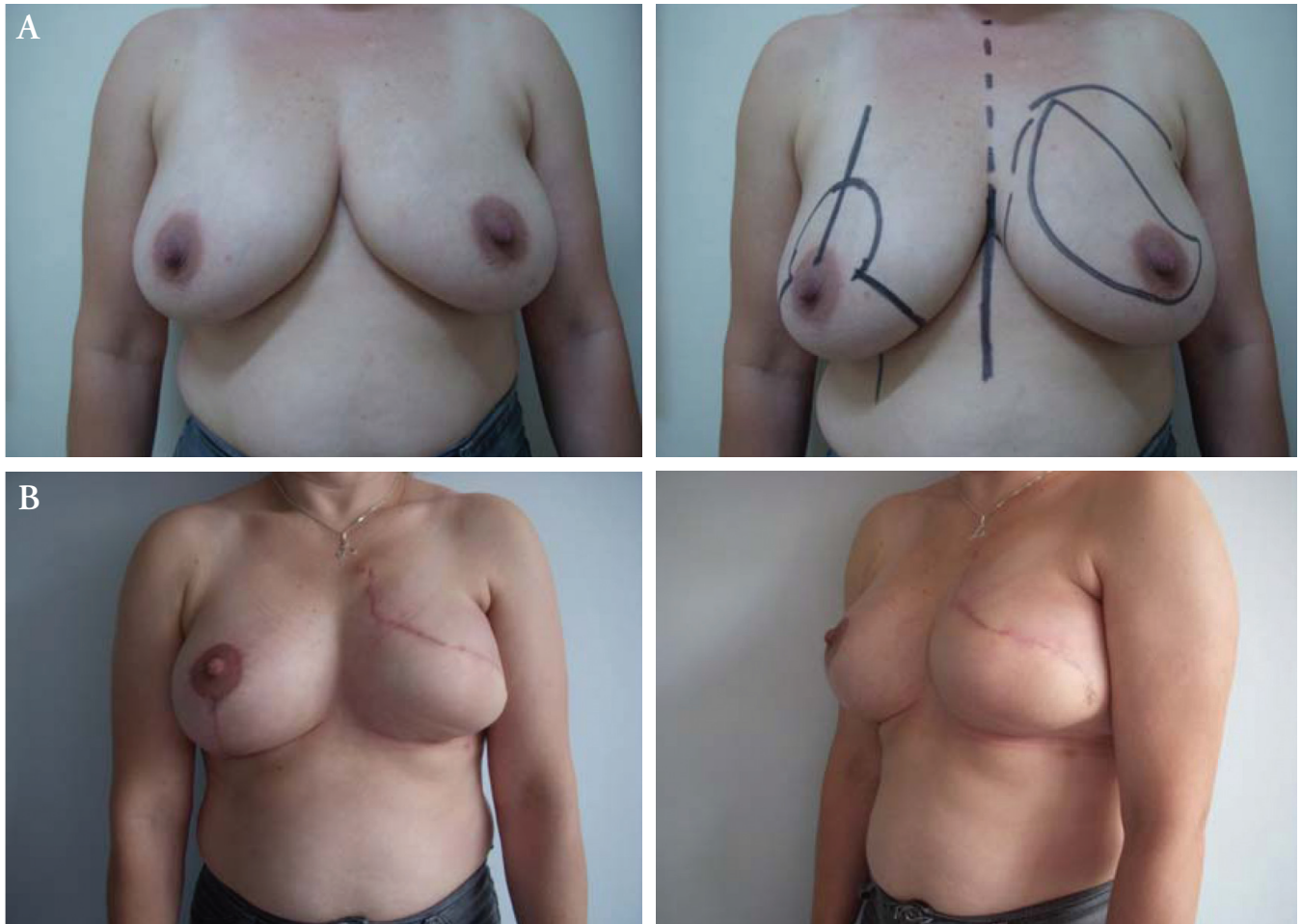


Figure 3. (A) Preoperative view of a 37-year-old patient with multicentric invasive ductal carcinoma in the left breast, pT2N0, ER/PgR -, HER2-, where the lactation has ceased three months ago; (B) postoperative view six months after skin-sparing mastectomy, immediate breast reconstruction with an implant Allergan Style 410 MX 520cc, and contra-lateral breast reduction.

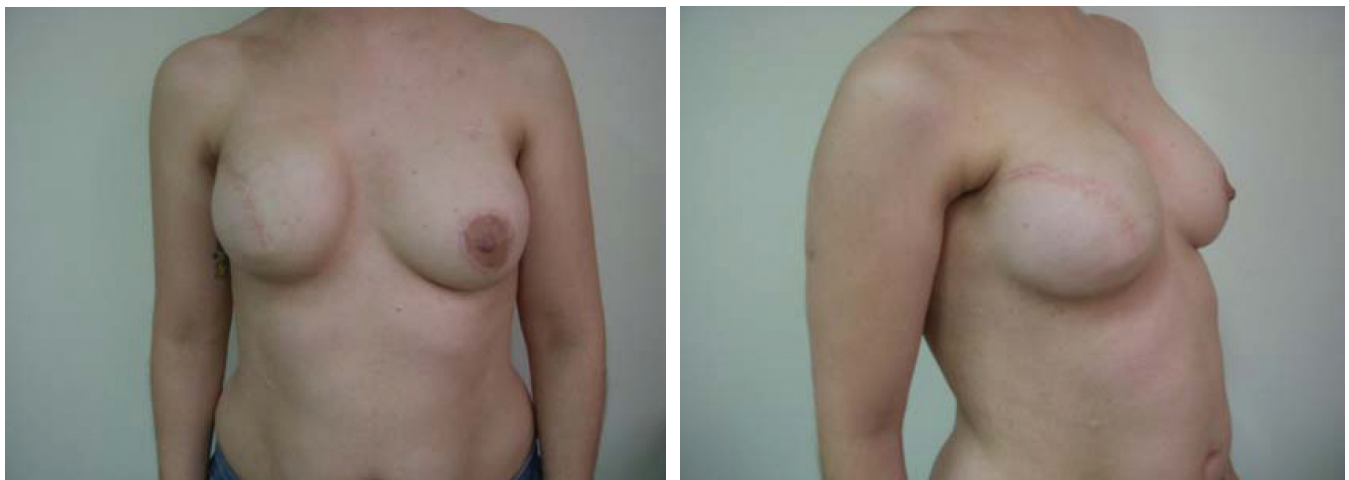


Figure 4. Postoperative view seven months after radiotherapy in a patient who was lactating, with an invasive ductal carcinoma, pT2N2M0, ER+ PgR+, HER2-. She was previously submitted to a mastectomy, immediate breast reconstruction with temporary expander Mentor, changed by an implant Mentor CPG 323 400cc, and contra-lateral augmentation, after the end of chemotherapy.

DISCUSSION

Although breast conserving therapy is a good alternative in selected cases of PABC, higher tumors than those found in non-pregnant patients, associated to the fact that radiotherapy should be avoided until after delivery, result in low rate of this kind of surgery in this group of patients. In our group there were no indications of breast conserving surgery, since the dominant tumors were pT2 and pT3. Therefore, sentinel node biopsy is not yet consolidated in PABC, and all the patients were submitted to axillary dissection⁶.

Pregnancy affects all the body. Physiological changes particularly associated with pregnancy include: increased cardiac output, increased oxygen consumption, increased renal plasma flow, increased coagulability, decreased lung capacity, supine positional hypotension, and slow gastric emptying. They impose special care from anesthesiologists and surgical team². So there are limits to be considered in the extension of surgeries in pregnancy.

With regard to breast reconstruction, pregnancy affects particularly the breasts, resulting in glandular hyperplasia and hypertrophy (mean breast weight normally doubles in pregnancy), increasing ptosis, areolar enlargement, nipple hypertrophy, and increasing pigmentation of the nipple and areola. At the end, breast anatomy is completely altered. Unfortunately no data exists about the changes in breast structure, as well as volume and shape, and how it can affect the decisions on the best technique to reconstruct the breast in PABC. Due to that, some authors defend that breast reconstruction should be delayed until after delivery when all reconstructive options can be available (especially autologous tissue flaps), and when symmetry is easier to achieve.

However, nowadays immediate breast reconstruction is widely preferred and does not have a negative influence on breast cancer survival rates or recurrences. It has innate advantages in terms of quality of life and aesthetic outcomes, if compared to delayed reconstruction, especially for young women. So our reconstructive approach to these patients in this series was to divide them in three different categories, according to the phase of their pregnancy and body and breast modifications:

- first trimester: breast and body are less modified by pregnancy. The result of the reconstructed breast is more predictable than in the other two phases. Then immediate reconstruction could be performed in a one-step surgery with breast implants and contra-lateral symmetry with breast reduction or mastopexy; or in a two-step surgery with temporary breast expanders (Figure 1). Autologous tissue flaps, especially those abdominal wall techniques (pedicled or free TRAM flaps), are contraindicated. Latissimus dorsi flap could be indicated in well selected cases, but it increases both surgical time and clinical complications. In this series there was only one patient

submitted to immediate breast reconstruction through one-step surgery with definitive implant and contra-lateral symmetry, resulting in a good aesthetic result. There were no significant modifications in their breasts over the time (Figure 1);

- second and third trimester: the breast and body modifications are more evident and the end result of the reconstructed breast is less predictable. So temporary expanders are the best choice in this group. The second surgery should be done at least six months after delivery (considering the impossibility of most patients in lactation due to oncologic treatment), or six months after lactation, when the breast achieves the normal shape, ptosis and volume;
- lactation: the breast modifications are more evident and the body modifications are progressively less important than before delivery. Temporary expanders could be the best choice. The second surgery should be done at least six months after lactation has ceased, when the breasts will achieve their definitive volume, shape and ptosis. Autologous flaps could be indicated as primary surgery in selected cases, considering that the risks are the same as those in non-lactating and non-pregnant patients. But in the decision, it is necessary to consider the unpredictability of breast modifications after lactation. It could be a negative influence to breast symmetry. In fact, most of the patients in our series were in this category. All of them were submitted to temporary expanders with good long-term results. After the end of lactation it was easier to achieve symmetry by changing the temporary expander for a definitive implant and by performing contra-lateral mammaplasty (Figure 2). Most patients in this series were in this group. There were no additional complications due to lactation. In cases where lactation is ceased at least three months it is possible to do one-step reconstructive surgery with definitive implant (Figure 3).

Since PABC is a group of patients usually with a more aggressive disease (Table 1), we expected that some of these patients will undergo postmastectomy radiotherapy and a more aggressive adjuvant therapy. We need to consider it in the decision process. But in our series, only two patients were included in ASCO criteria and needed to be submitted to it⁸. Only one of them underwent breast reconstruction with temporary expander and long-term result after radiotherapy was good, with only Baker 2 capsular contracture after seven months (Figure 4). Therefore, there was no delay in the beginning of chemotherapy in this series.

If the patient has no oncologic contraindication for immediate breast reconstruction, the key-point in this model for the decision process of the best technique is lactation. First trimester

patients and those patients where lactation have ceased at least three months ago are more predictable in terms of shape, volume and ptosis, so a one-step surgery could be a good option. In cases where effects of lactation in the breast are present, temporary expanders could be the best choice, because it is not possible to achieve symmetry due to accentuated breast modifications.

So we believe that with this reconstructive approach to PABC patients, it is possible to minimize the effects of mastectomy. It is a transversal model which considers all aspects: oncologic, obstetric and reconstructive. These preliminary results have demonstrated that it did not increase the clinical and oncologic risks, and could preserve the quality of life of the mother, without compromising the fetus in this series.

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