



Occult breast cancer during reduction mammoplasty: case report

Nicola Panizzo*, Chiara D'Aloja*, Serena Scomersi**, Giovanni Papa*, Marina Bortul***, Zoran Marij Arnez*

Cattinara University Hospital of Trieste, Italy

*University Department of Plastic, Reconstructive and Aesthetic Surgery

**Department of Surgery

***University Department of Surgery

Occult breast cancer during reduction mammoplasty: case report

AIM: Breast carcinoma occurring in routine reduction mammoplasty is rare.

MATERIAL OF STUDY: In our Breast Unit each patient eligible for any breast surgery is routinely evaluated by preoperative breast imaging. We reported the clinical case of a woman with an infiltrating lobular breast cancer detected during surgical reduction mammoplasty despite a negative preoperative bilateral mammography.

RESULTS: The clinical case was discussed at multidisciplinary breast cancer meeting in order to evaluate the different therapeutic options. In conjunction with general surgeons, oncologists, radiologists and radiotherapists, and upon patient's ultimate decision, a conservative tumor approach was chosen: first-level axillary node dissection followed by adjuvant chemotherapy and hormonotherapy.

DISCUSSION: The mean frequency of breast cancer detection during reduction mammoplasty ranges from 0.06% up to 4%. There are many possible treatment choices for these patients ranging from radical mastectomy to more conservative approaches dealing with lumpectomy followed by radiation therapy or chemotherapy and radiation therapy alone. The therapeutic plan must be discussed by a multidisciplinary team and many tumors and patients characteristics should be evaluated in the decision making process.

CONCLUSION: All patients selected for breast aesthetical surgery must be screened, during preoperative workup, for breast cancer. Combination of three diagnostic modalities increases sensitivity and reaches the diagnostic accuracy of 93.2%. The reported case stresses the importance of an oncological approach to breast surgery even in case of planned aesthetical procedures.

KEY WORDS: Breast cancer; Infiltrating lobular carcinoma; Reduction Mammoplasty; Mammography; Macromastia; Occult breast carcinoma

Introduction

Reduction mammoplasty is a common surgical procedure for treatment of macromastia. On average, 38

reduction mammoplasties are performed every year at the Department of Plastic Reconstructive and Aesthetic Surgery of Trieste with a mean age of 52 years. Our indications for reduction mammoplasty are functional: breast weight and/or proved cervicgia.

The incidental finding of breast carcinoma during reduction mammoplasty is rare and ranges from 0.06% to 4% in reported studies¹²⁻²³. No standardised preoperative protocols for the screening of carcinoma exist. Indeed, in many cases, patients did not undergo preoperative mammography or other diagnostic methods^{1-3,31}.

Pervenuto in Redazione Novembre 2012. Accettato per la pubblicazione Gennaio 2013

Correspondence to: Dott.ssa D'Aloja Chiara U.C.O. di Chirurgia Plastica, Ricostruttiva ed Estetica, Azienda Ospedaliero Universitaria Ospedali Riuniti di Trieste, Strada di Fiume 447, 34149 Trieste (e-mail: chiara_daloja@hotmail.it)

In the most relevant studies the average age of patients who undergo reduction mammoplasty ranges from 36 to 52 years ⁴. This figure supports the necessity to set a “cut off” before subverting breast anatomy by applying the well-known aesthetic surgery techniques to reduce breast volume.

Mammography along with breast ultrasound represents the most sensitive tool for breast cancer screening in women older than 40 years ⁵⁻⁶. Annual mammography screening is recommended by the American Cancer Society in women above the age of 40 ⁷, while the U.S. Preventive Services Task Force recommends mammography screening every two years for women aged 50 to 74 years ⁸.

The indication for the necessity to associate the two diagnostic procedures is due to their different accuracy, depending on histological subtype of breast carcinoma. In particular, infiltrating lobular carcinoma (ILC) presents a false-negative rate respectively up to 19% at mammography ⁹ and up to 12,3% at ultrasound ¹⁰.

Case report

A 65-year-old woman with bilateral macromastia was treated with reduction mammoplasty at the Department of Plastic Reconstructive and Aesthetic Surgery in Cattinara University Hospital of Trieste (Fig. 2).

Our preoperative workup for patients eligible for breast reductive surgery includes patient's medical history, especially referred to breast cancer risk factors and hormonal exposure, bilateral physical breast examination and digital mammography in order to rule out in-action pathologies and to assess the patient own risk for breast can-

cer. Breast ultrasound is not routinely performed and is indicated upon the radiologist's request.

Two months before surgery, the patient underwent bilateral digital mammography which was classified as Bi-RADS 2 according to American College of Radiology and showed no lesions nor suspicious microcalcifications (Fig. 1). The only radiological report was the presence of benign-looking rough calcifications. Previous mammographical checks, performed by the patient herself as screening, were normal, without any suspicious lesion finding. No familial risk factors for breast cancer nor any previous breast operation were found in her medical history. She had three full-term pregnancies and was physiolog-



Fig. 2: Before reduction mammoplasty

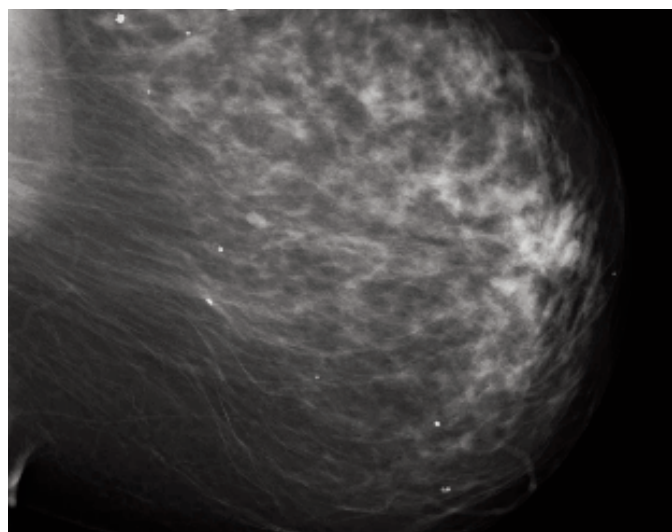


Fig. 1: Preoperative digital mammography

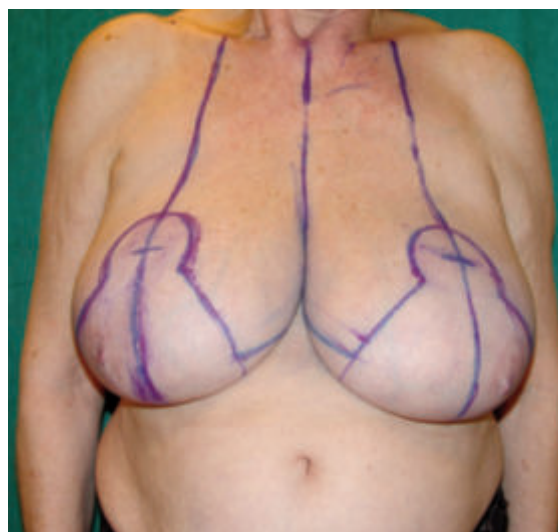


Fig. 3: Superior pedicle with T reversed scar reduction mammoplasty preoperative marking

ically menopausal at the time of reduction surgery with no substitutive hormonal therapy.

She was a heavy smoker with arterial hypertension and mild respiratory distress, so, at the admission, she was classified by the Anaesthesiological team as ASA 3.

From the clinical point of view, the patient showed severe breast hypertrophy with frequent neck pain, so she underwent her breast reductive surgical procedure performed as a superior pedicle reduction mammoplasty with reversed "T pattern" scar was performed (Fig. 3). At time of surgery 595 g of tissue from right breast and 605 g from the left one were removed and analysed histologically. Surgeons removed breast tissue from inferior

quadrants in one single block, in order to better orientate the specimen and facilitate the requested pathologic assessment (Fig. 4).

A not-well-delimited fibrocystic nodular lesion (34x30x7 mm of diameter) with unclear texture and partially amorphous content, was found along the medial pillar incision of the left breast, about 4 cm below the areola/nipple area. Based on macroscopic margins, the lesion was removed and sent apart to histological evaluation. To improve mammary cone reconstruction, further medial pillar trimming was performed.

In the immediate postoperative care, patient showed acute respiratory failure and congestive cardiac insufficiency due to severe aortic valve stenosis, not discovered during the preoperative evaluations, and urgently transferred to Heart Surgery Department.

The histological evaluation of the suspicious specimen revealed a 18 mm pleomorphic lobular carcinoma. The microscopic evaluation detailed a solid infiltrating lobular carcinoma, in all histologic cuts, close to the plane of resection. A moderate desmoplasia with a focal cribriform intraductal component was present. No sign of necrosis or uncertain vascular invasion was detected. Positivity to estrogen receptors (clone SP-1), to *CerbB2/Her2* (clone CB11) and to *Keratin 34βE12* was revealed by the immuno-histochemical evaluation. The expression of p53 protein was moderate, while that of progesterone receptors was weak and that of E-Cadherin and Cytokeratin 5-6 was negative. According to TNM stadition, it was a pT1cNx-stage carcinoma, Grade 2-3 according to W.H.O.

Patient underwent post-operative magnetic resonance, with no sign of suspected focal lesions.

Considering the histopathological relevance, the clinical case was discussed at one of multidisciplinary breast cancer meetings in order to evaluate the different therapeutic options. In conjunction with general surgeons, oncologists, radiologists and radiotherapists, and upon patient's ultimate decision, a conservative tumor approach was chosen: a first-level axillary node dissection was performed, followed by adjuvant chemotherapy and hormonotherapy with anastrozole and trastuzumab. There was no indication for post-operative radiotherapy. The decision to adopt such an approach was taken in accordance with the international guidelines¹¹, on the basis of negative magnetic resonance imaging (performed following the histopathological evaluation) and considering the new heart surgical and pulmonary clinical situation of the patient.

About two months after reduction mammoplasty surgery, the patient underwent aortic valve replacement and three aortocoronary bypasses. Contextually, first-level axillary node dissection was performed by general surgeon. No axillary lymph nodes metastases on 10 lymph nodes excised were identified.

Eighteen months after first surgery, the patient doesn't show any sign of recurrence of disease and continues oncological follow-up as established by the protocol (Fig. 5).

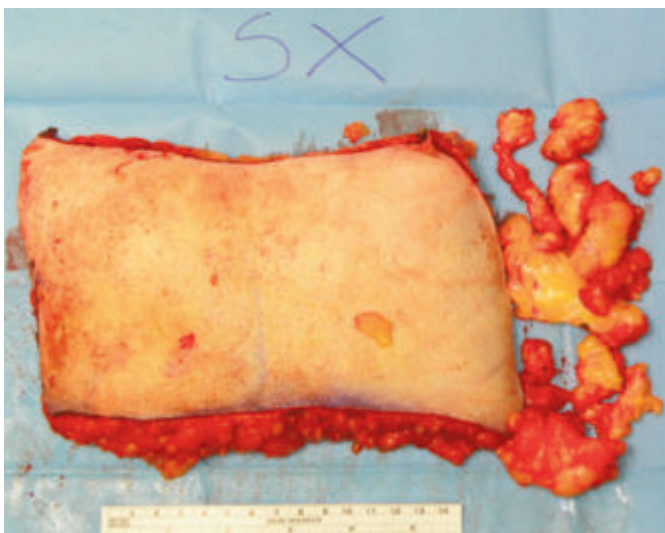


Fig. 4: Parts of the left breast sent for histological examination



Fig. 5: Ten months after reduction mammoplasty

Discussion

In literature there are only few studies dealing with occult breast cancer occurring during aesthetic breast surgical procedures, showing different data (Tab. I).

The mean frequency of breast cancer detection during reduction mammoplasty ranges from 0.06% up to 4%¹²⁻²³. Such a great variation is probably due to different protocols of preoperative workup. There are some data from studies reporting the aesthetic surgical procedure performed without preoperative radiological breast evaluation^{1-3,31}. Moreover, there are published data reporting high cumulative incidence of occult breast cancer as the result of both the intraoperative identification rate and the preoperative detection rate.

Radiological detection of invasive lobular breast carcinoma is associated with higher false negative rate (19%) when compared to other breast cancer histological types. In lobular breast cancer patient's mammography shows a reduced sensitivity and accuracy²⁴⁻²⁷. Moreover, breast ultrasound fails to identify lobular carcinoma in 12.3% of cases, as showed by many published studies^{10,28}.

There are many possible treatment choices for an occult breast cancer detected during an aesthetical breast procedure, ranging from the radical mastectomy to more conservative approaches dealing with lumpectomy followed by radiation therapy or chemotherapy and radiation therapy alone²⁹.

The therapeutical plan must be discussed by a multidisciplinary team and many tumors and patients characteristics should be evaluated in the decision making process. The histological type and grade, excision margins status and tumor biological features (hormonal and Her2 status, proliferation index, presence of lymphovascular invasion) should be carefully evaluated.

Considering tumor stage of our breast cancer patient and positivity of surgical margins identified at histological evaluation, the best treatment option was a wide excision of the tumoral bed followed by irradiation of the whole breast^{26,30}.

The planned surgical treatment could not be realized, because the reduction mammoplasty had altered the pre-

vious breast architectural structure making impossible to precisely identify the tumoral bed. Moreover, the exact localization of previous tumoral excision site wasn't recognizable even at a contrast enhanced breast MRI, performed in the early postoperative weeks in order to better evaluate bilateral residual breast tissue. On the other hand, mastectomy was excluded because firmly refused by the patient herself. As a consequence, the multidisciplinary breast team decided not to perform any surgical procedure. Nevertheless, even external radiotherapy was not performed because the patient was considered at high risk of cardiac toxicity.

According to the Oncologists and Radiotherapist's advise and thanks to favourable biological tumor characteristics, we decided to perform only the axillary staging with complete axillary lymph node dissection and we found no metastases. Patient was finally submitted to the Oncological Department where a combined chemotherapeutic and hormonal therapeutic protocol was initiated.

Conclusions

Reduction mammoplasty is one of the most frequent surgical procedures performed for both aesthetical and pathophysiological aims³².

At the Department of Plastic Reconstructive and Aesthetic Surgery of Trieste we performed 190 surgical procedures for breast hypertrophy during the last 5 years, with a mean patient age of 52 years.

The indication for surgery was, in 70% of cases, the presence of functional consequences of breast hypertrophy while in 30% of patients the surgical procedure was performed in order to gain an aesthetical improvement. During the last 3 years we performed patients selection for breast reduction surgery according to definite criteria: age, mammary hypertrophy characteristics, ptosis grade, tissue texture, pain in the back, neck or shoulders, skin moisture, shoulder groove due to bra, general risk factors, risk of breast cancer, previous breast surgery, aesthetic and psychological involvements, patient expectations.

All patients selected for breast aesthetical surgery must be screened, during preoperative workup, for breast cancer. Mammography is performed most frequently, but shows lack of accuracy in certain subtypes of patients⁹. At our department we usually perform mammography in combination with breast physical exam and ultrasound. Combination of 3 diagnostic modalities increases sensitivity and reaches the diagnostic accuracy of 93.2%²⁶. As a consequence our detection rate of occult breast cancer during aesthetical surgical procedure is 1/190 (0.5%), while in literature the mean detection rate is quite higher (0.06-4%)¹²⁻²³.

The reported case stresses the importance of an oncological approach to breast surgery even in case of planned aesthetical procedures. If we consider each patient as an

TABLE I - Published studies dealing with frequency of occult breast cancer occurring during reductive mammoplasty.

Synderman e Lizardo ¹²	1960	0.3%
Pitanguy e Torres ¹³	1964	1.5%
Pennisi e Capozzi ¹⁴	1975	2%
Jansen et al. ¹⁵	1998	0.16%
Tang et al. ¹⁶	1999	0.06%
Dotto et al. ²⁰	2008	0.2%
Colwell et al. ²¹	2004	0.4%
Kakagia et al. ²²	2005	0.95%
Viana et al. ²³	2005	1.1%
Ambaye et al. ¹⁹	2009	4%
Slezak et al. ²⁹	2011	1.15%

hypothetical breast cancer patient we would be able to recognise the presence of occult breast cancer before any surgical procedure.

Moreover, in case of intraoperative detection of breast cancer, the presence of a multidisciplinary board is important for the process of decision making and for the choice of the best therapeutic option, made according to the ongoing international recommendations and guidelines. The reported case was largely discussed by our breast multidisciplinary board and the therapeutic plan was approved taking into consideration different tumor and patients characteristics and according to patient own requests.

Riassunto

INTRODUZIONE: L'intervento di mastoplastica riduttiva nelle pazienti con ipertrofia mammaria richiede un accurato esame obiettivo ed opportuni accertamenti preoperatori. Tutte le nostre pazienti vengono sottoposte, prima dell'intervento chirurgico, ad ecografia e/o mammografia bilaterale allo scopo di valutare la struttura mammaria ed escludere l'eventuale presenza di lesioni sospette.

MATERIALI e METODI: In questo lavoro presentiamo il caso di una paziente di 64 anni caratterizzata da macromastia con ptosi ed asimmetria mammaria bilaterale. La paziente è stata sottoposta a mammografia preoperatoria con dimostrazione di un quadro mammario nella norma. Come avviene per ogni intervento chirurgico di mastoplastica riduttiva, i pezzi operatori adipoghiandolari asportati intraoperatoriamente sono stati inviati per esame istologico definitivo.

RISULTATI: L'esito dell'esame istologico definitivo ha dimostrato la presenza di un carcinoma mammario lobulare pleomorfo a livello della mammella sinistra, non evidenziato alla mammografia. La neoplasia risultava asportata completamente, quindi, in accordo con il chirurgo generale e l'oncologo, si è optato per l'esecuzione della linfadenectomia ascellare di I livello ed il successivo trattamento adiuvante chemio ed ormonoterapico.

CONCLUSIONI: Il riscontro intraoperatorio di un carcinoma mammario nel corso di un intervento di chirurgia estetica non è un'evenienza frequente. L'esecuzione di mammografia ed ecografia mammaria bilaterale in associazione ad un accurato esame obiettivo preoperatorio consentono di ridurre ulteriormente tali riscontri. L'iter terapeutico previsto richiede necessariamente l'impostazione di una discussione multidisciplinare del caso, allo scopo di condividere le scelte terapeutiche con il chirurgo oncologo, l'oncologo medico ed il radioterapista.

References

1. Dinner MI, Artz JS: *Carcinoma of the breast occurring in routine reduction mammoplasty*. Plast Reconstr Surg, 1989; 83(6):1042-44.

2. Crikelair GF, Malton SD: *Mammoplasty and occult breast malignancy: Case report*. Plast Reconstr Surg Transplant Bull, 1959; 23(6):601-06.

3. Gottlieb JR, McKinney P, Walkinshaw MD, Sperling RL: *Occult breast carcinoma in patients undergoing reduction mammoplasty*. Aesthetic Plast Surg, 1989; 13(4):279-83.

4. Chadbourne EB, Zhang S, Gordon MJ, Ro EY, Ross SD, Schnur PL, Schneider-Redden PR: *Clinical outcomes in reduction mammoplasty: A systematic review and meta-analysis of published studies*. Mayo Clin Proc, 2001; 76(5):503-10.

5. Meissner HI, Klabunde CN, Han PK, Benard VB, Breen N: *Breast cancer screening beliefs, recommendations and practices: Primary care physicians in the united states*. Cancer, 2011; doi: 10.1002/cncr.25873. [Epub ahead of print].

6. Kopans DB: *Screening for breast cancer and mortality reduction among women 40-49 years of age*. Cancer, 1994; 74(1 Suppl):311-22.

7. Smith RA, Mettlin CJ, Davis KJ, Eyre H: *American Cancer Society guidelines for the early detection of cancer*. CA Cancer J Clin, 2000; 50:34-49.

8. US Preventive Services Task Force: *Screening for breast cancer: U.S. Preventive Services Task Force recommendation statement*. Ann Intern Med, 2009; 151(10):716-26, W-236.

9. Krecke KN, Gisvold JJ: *Invasive lobular carcinoma of the breast: mammographic findings and extent of disease at diagnosis in 184 patients*. AJR Am J Roentgenol, 1993; 161(5):957-60.

10. Butler RS, Venta LA, Wiley EL, Ellis RL, Dempsey PJ, Rubin E: *Sonographic evaluation of infiltrating lobular carcinoma*. AJR Am J Roentgenol, 1999; 172(2):325-30.

11. NCCN: *Breast Cancer*. V.1.2010.

12. Snyderman RK, Lizardo JG: *Statistical study of malignancies found before, during, or after routine breast plastic operations*. Plast Reconstr Surg Transplant Bull, 1960; 25:253-56.

13. Pitanguy I, Torres ET: *Histopathological aspects of mammary gland tissue in cases of plastic surgery of breast*. Br J Plast Surg, 1964; 17:297-302.

14. Pennisi VR, Capozzi A: *The incidence of obscure carcinoma in subcutaneous mastectomy. Results of a national survey*. Plast Reconstr Surg, 1975; 56(1):9-12.

15. Jansen DA, Murphy M, Kind GM, Sands K: *Breast cancer in reduction mammoplasty: Case reports and a survey of plastic surgeons*. Plast Reconstr Surg, 1998; 101(2):361-64.

16. Tang CL, Brown MH, Levine R, Sloan M, Chong N, Holowaty E: *Breast cancer found at the time of breast reduction*. Plast Reconstr Surg, 1999; 103(6):1682-686.

17. White RR 4th.: *Incidence of breast carcinoma in patients having reduction mammoplasty*. Plast Reconstr Surg, 1998; 102(5):1774-775.

18. Keleher AJ, Langstein HN, Ames FC, Ross MI, Chang DW, Reece GP, Singletary SE: *Breast cancer in reduction mammoplasty specimens: Case reports and guidelines*. Breast J, 2003; 9(2):120-25.

19. Ambaye AB, MacLennan SE, Goodwin AJ, Suppan T, Naud S, Weaver DL.: *Carcinoma and atypical hyperplasia in reduction mammoplasty: Increased sampling leads to increased detection. A prospective study*. Plast Reconstr Surg, 2009; 124(5):1386-392.

20. Dotto J, Kluk M, Geramizadeh B, Tavassoli FA: *Frequency of clinically occult intraepithelial and invasive neoplasia in reduction mammoplasty specimens: A study of 516 cases*. Int J Surg Pathol, 2008; 16(1):25-30.
21. Colwell AS, Kukreja J, Breuing KH, Lester S, Orgill DP: *Occult breast carcinoma in reduction mammoplasty specimens: 14-year experience*. Plast Reconstr Surg, 2004; 113(7):1984-988.
22. Kakagia D, Fragia K, Grekou A, Tsoutsos D: *Reduction mammoplasty specimens and occult breast carcinomas*. Eur J Surg Oncol, 2005; 31(1):19-21.
23. Viana GA, Pitanguy I, Torres E: *Histopathological findings in surgical specimens obtained from reduction mammoplasties*. Breast, 2005; 14(3):242-48.
24. Lopez JK, Bassett LW: *Invasive lobular carcinoma of the breast: spectrum of mammographic, US, and MR imaging findings*. Radiographics, 2009; 29(1):165-76.
25. Kopans DB: *Mammography: Yet another challenge*. Radiology, 2009; 253(3):587-89.
26. Berg WA, Gutierrez L, NessAiver MS, Carter WB, Bhargavan M, Lewis RS, Ioffe OB: *Diagnostic accuracy of mammography, clinical examination, US, and MR imaging in preoperative assessment of breast cancer*. Radiology, 2004; 233(3):830-49. Epub 2004 Oct 14.
27. Mann RM: *The effectiveness of MR imaging in the assessment of invasive lobular carcinoma of the breast*. Magn Reson Imaging Clin N Am, 2010; 18(2):259-76, ix.
28. Selinko VL, Middleton LP, Dempsey PJ: *Role of sonography in diagnosing and staging invasive lobular carcinoma*. J Clin Ultrasound, 2004; 32(7):323-32.
29. Slezak S, Bluebond-Langner R: *Occult carcinoma in 866 reduction mammoplasties: Preserving the choice of lumpectomy*. Plast Reconstr Surg, 2011; 127(2):525-30.
30. Harake MD, Maxwell AJ, Sukumar SA: *Primary and metastatic lobular carcinoma of the breast*. Clin Radiol, 2001; 56(8):621-30.
31. Clark CJ, Whang S, Paige KT: *Incidence of precancerous lesions in breast reduction tissue: A pathologic review of 562 consecutive patients*. Plast Reconstr Surg, 2009; 124(4):1033-39.
32. Noone R, Barrett MD: *An evidence-based approach to reduction mammoplasty*. Plast Reconstr Surg, 2010; 126(6):2171-176.