Preoperative imaging prior to breast reconstruction surgery: Benchmarking bringing together radiologists and plastic surgeons. Proposed guidelines

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Breast imaging; Preoperative; Radiologists; Plastic surgeons; Mammography; Ultrasound

Summary
Background. — Prescription of preoperative imaging assessment prior to planned breast reconstruction surgery (reduction or augmentation mastoplasty, correction of congenital breast asymmetry) is poorly codified. The objective of this study was to analyze the attitudes of French radiologists and plastic surgeons with regard to prescription of preoperative imaging in the framework of non-oncologic breast surgery.

Material and methods. — This is a descriptive and comparative observational study involving two groups, one consisting of 50 plastic surgeons (P) and the other of 50 radiologists (R) specialized in breast imaging. A questionnaire was handed out to radiologists during a conference on breast imaging at the Institut Gustave-Roussy in Paris (France) held on 17th December 2012. The same questionnaire was handed out to plastic surgeons at the National Congress of the French Society of Plastic and Reconstructive Surgery (SOFCPRE) held on 19th, 20th and 21st November 2012, also in Paris (France). The questionnaire focused on prescription of preoperative and postoperative imaging evaluation for non-oncologic breast surgery in patients with no risk factors for breast cancer or clinically identified indications.
Introduction

A review of the literature fails to show a consensual attitude with regard to performance of preoperative imaging assessment prior to breast surgery in patients not presenting any particular risk factor for breast cancer. In France, the only commonly accepted recommendations [1–3] involve systematic mammography every 2 years from the age of 50. On a European scale [4], in the framework of augmentation mammoplasty by implants for patients not presenting a risk factor for breast cancer, expert opinion has proposed a preoperative imaging assessment including bilateral mammary ultrasound before the age of 35 years and a mammogram from the age of 35 in women not presenting a risk factor for breast cancer, but these kinds of proposals, which arise from the advice given by experts, cannot be considered as actual recommendations, and we have found no recommendations at all pertaining to mammary reduction surgery.

The objective of this study is to compare the attitudes of two categories of practitioners, that is to say plastic surgeons and radiologists, and thereby evaluate prevailing professional practices with regard to prescription of preoperative imaging assessment in the framework of non-carcinologic breast surgery (mammary reduction, mammary augmentation by implant placement, mammary asymmetry correction by reduction of contralateral breast and/or implant placement) in patients not presenting risk factors for breast cancer. The goal of this article is to present the results of this comparative study, to put them into perspective relative to the data reported in the literature, and to attempt to propose guidelines that could effectively contribute to harmonization of the relevant practices.

Material and methods

We carried out a descriptive and comparative observational study including two groups, one consisting in 50 plastic surgeons and the other in 50 radiologists specialized in senology. A questionnaire was handed out to the radiologists specialized in senology at a conference on breast imagery held on 17 December 2012 at the Gustave-Roussy institute in Paris (France). It had already been handed out to the plastic surgeons at the National Congress of the French Society of Plastic and Reconstructive Surgery (SOFCPRE) held on 19th, 20th and 21st November 2012, also in Paris. It covered the practice of preoperative and postoperative imaging assessment in breast surgery such as reduction mammoplasty, augmentation by implant placement and mastopexia. The questionnaires were anonymous, and those received and completed by the radiologists and the plastic surgeons were the same. Only practitioners having successfully presented their theses with a degree in specialized studies of radiology or plastic surgery were allowed to participate.

The questionnaire contained no queries pertaining to breast reconstruction, to correction of tumorectomy sequel or to mammary transfer of autologous adipose tissue. It was limited to patients presenting neither a risk factor for breast cancer nor a clinically identified indication such as mastodynia or suspicious nipple discharge.

When interrogating the radiologists and the plastic surgeons, we attempted to define the age starting from which practitioners systematically prescribed preoperative imagery evaluation for patients not presenting a specific risk factor for breast cancer. In addition, we made a point of specifying the time lapse at the end of which, breast imaging was considered non-recent, which meant that a new preoperative prescription was deemed justified. According to type of breast surgery, (reduction or augmentation by prosthetic implant, correction of mammary asymmetry), the questions were reframed in view of identifying the interest of preoperative and postoperative breast imagery and of determining the extent to which clinically assessed mammary density was brought to bear on the imagery prescription. As concerns augmentation mammoplasty by placement of prosthetic implant, we wished to see whether preoperative imagery prescription was affected by the surgical approach, by the position of the implant (pre- or retro-muscular) or by the type of implant. In cases involving management of mammary asymmetry justifying surgical intervention on

Results.  — Forty-six percent of the plastic surgeons considered an imaging exam to be recent when it had been carried out over the previous 6 months, while 40% of the radiologists set the figure at 1 year. Clinical breast density exerted no influence on 92% of the plastic surgeons and 98% of the radiologists. A majority of the plastic surgeons would prescribe a preoperative exam regardless of age (57% for breast reduction, 61% for breast implant placement and 61% for surgical correction of asymmetry) while the radiologists would prescribe exams mainly for patients over 40 years (50% for reduction, 44% for augmentation, 49% for asymmetry correction). The plastic surgeons would prescribe either ultrasound or mammograms (59% for reduction, 72% for augmentation, 66% for asymmetry correction) while radiologists would usually prescribe mammograms (64%, 57%, 64%). Most of the radiologists, along with the plastic surgeons, did not think that postoperative examination is justified (58% of P and 62% of R for reduction, 56% P and 68% R for augmentation, 52% of P and 64% of R for asymmetry correction).

Conclusion.  — In 2012, there existed no French consensus on prescription of a preoperative imaging assessment in the framework of non-oncologic breast surgery in patients without risk factors for breast cancer. Active cooperation bringing together radiologists and plastic surgeons is likely to facilitate the harmonizing of their respective practices. In this paper, we propose guidelines that could help them to synchronize their efforts.

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one breast alone, we looked into the possible interest of bilateral and comparative preoperative imagery.

Results

Evaluation of the recentness of mammary imaging

Mammary imaging was considered recent if it dated back to less than 6 months by 46% of the plastic surgeons (n = 23), if it dated back to less than 3 months by 16% (n = 8), and if it dated back to less than a year by 32% (n = 16). As for the radiologists, 32% of them (n = 16) considered mammary imaging to be recent if it dated back to less than 3 months, 10% (n = 5) if it dated back to less than 6 months, and 40% (n = 20) if it dated back to less than a year.

The effect of clinical mammary density on imagery prescription

In 92% of the cases (n = 46), the surgeons answered that clinical mammary density did not affect their prescription of preoperative imagery, and 98% of the radiologists (n = 49) replied likewise.

Attitude with regard to unilateral or bilateral reduction mammoplasty

Prescription of preoperative imaging assessment was recommended by 98% (n = 49) of the plastic surgeons and by 100% (n = 50) of the senological radiologists.

Among the plastic surgeons recommending preoperative imaging, in 57% (n = 28) of the cases no minimum age for prescription was indicated. As for the other plastic surgeons, a minimum age for preoperative imaging prescription was set at 20 years by 12% (n = 6), at 25 years by 4% (n = 2), at 30 years by 16% (n = 8), at 35 years by 12% (n = 6), at 40 years by 4% (n = 2), and at 50 years by 2% (n = 1).

Among the radiologists recommending preoperative imaging, in 24% (n = 12) of the cases no minimum age for the prescription was indicated. As concerns the minimum age counseled by the other radiologists preoperative imaging assessment, it was set at 20 years by 8% (n = 4), at 25 years by 4% (n = 2), at 30 years by 16% (n = 8), at 35 years by 12% (n = 6), at 40 years by 50% (n = 25), and at 50 years by 2% (n = 1).

Imaging assessment

Among the plastic surgeons, imaging assessment including bilateral mammary ultrasound and mammography was prescribed in 59% of the cases (n = 29). Ultrasound alone was prescribed in 2% (n = 1), and mammography alone in 32% (n = 16). As regards mammography prescription, two incidences were required in 24% of the cases (n = 12) and a single incidence in 2% (n = 1), while in 64% (n = 32), the number of required incidences was not specified. In 6% of the cases (n = 3), the imaging assessment was complemented by MRI.

Among the radiologists, imaging assessment including bilateral mammary ultrasound and mammography was prescribed in 36% of the cases (n = 18). Whereas ultrasound alone was never prescribed, mammography alone was prescribed in 64% of the cases (n = 32). As regards mammography prescription, two incidences were required in 68% of the cases (n = 34) and a single incidence in 2% (n = 1), while in 34%, the number of incidences was not specified. Imaging assessment was never complemented by MRI.

Prescription of postoperative imaging

Prescription of postoperative imaging was deemed unnecessary by the plastic surgeons in 58% (n = 29) of the cases. On the contrary, it was considered useful in 18% (n = 9) 6 months after the operation, in 18% (n = 9) 1 year later, and in 2% (n = 1) 2 years later. Postoperative imaging was prescribed in only 2% (n = 1) of the cases, without specification of the type of complication.

Prescription of postoperative imaging was deemed unnecessary by the radiologists in 62% (n = 31) of the cases, whereas it was considered useful in 6% of the cases (n = 3) 6 months after the operation, in 14% (n = 7) 1 year later and in 2% (n = 1) 2 years later. Postoperative imaging was prescribed in only 18% (n = 9) of the cases, without specification of the type of complication.

Prescription with regard to augmentation mammoplasties by placement of prosthetic implant and mastopexies alone and/or associated with a prosthetic implant

Prescription of preoperative imaging assessment is recommended by 88% (n = 44) of the plastic surgeons and by 90% (n = 45) of the senological radiologists.

Among the plastic surgeons recommending preoperative imaging, in 63% (n = 28) of the cases no minimum age for the prescription was indicated. Conversely, a minimum age for preoperative imaging prescription was set at 20 years by 11% (n = 5), at 25 years by 4% (n = 2), at 30 years by 15% (n = 7), at 35 years by 2% (n = 1), at 40 years by 4% (n = 2), and finally at 50 years by 2% (n = 1).

Among the radiologists recommending preoperative imaging, in 29% (n = 13) of the cases no minimum age for the prescription was indicated. As concerns the minimum age for prescription of a preoperative imaging assessment, it was set at 20 years in 7% (n = 14), at 30 years by 18% (n = 8), at 35 years by 2% (n = 1) and at 40 years by 44% (n = 20).

The imagery assessment

Among the plastic surgeons, imagery assessment including bilateral mammary ultrasound and a mammography was prescribed in 72% of the cases (n = 32). Ultrasound alone was prescribed in 2% of the cases (n = 1) and mammography alone in 18% (n = 8). As regards mammography prescription, two incidences were required in 28% of the cases (n = 13), and a single incidence in 2% (n = 1), while in 65% (n = 29) the number of incidences was not specified. Imaging assessment was never complemented by MRI.

Among the radiologists, imagery assessment including bilateral mammary ultrasound and a mammography was prescribed in 40% of the cases (n = 18). While ultrasound alone was never prescribed, mammography alone was prescribed in 57% of the cases (n = 26). As regards mammography prescription, two incidences were required in 70% of the
cases (n = 32) and a single incidence in 4% (n = 2). In 21% of the cases (n = 10), the number of incidences was not specified. Imaging assessment was complemented by MRI in 2% of the cases (n = 1).

Among the 44 plastic surgeons prescribing mammary imaging in the framework of preoperative assessment, 95% (n = 42) carried out the same assessment regardless of the surgical approach (areolar or sub-mammary), while 5% of them had no opinion on the subject. The characteristics of the prosthetic implant — its form (anatomical or round), its contents (silicone or physiological serum), its texture (microor macro-textured) had no affect on the prescription in 100% (n = 44) of the cases. Positioning of the implant (prepectoral or retropectoral) had no affect on the prescription in 93% (n = 41) of the cases, and 7% (n = 3) did not pronounce themselves.

As for the radiologists, in 100% of the cases (n = 45) the position of the implant and its intrinsic characteristics had no affect on imaging prescription.

Prescription of postoperative imaging was deemed unnecessary by the plastic surgeons in 56% (n = 28) of the cases. It was considered useful in 8% of the cases (n = 4) 6 months after the operation, in 14% (n = 7) 1 year later and in 8% (n = 4) 2 years later. Postoperative imaging was prescribed only in the event of a postoperative complication in 10% (n = 5) of the cases, without specification of the type of complication.

Prescription of postoperative imaging was deemed unnecessary by the radiologists in 68% (n = 34) of the cases. It was considered useful in 6% of the cases (n = 3) 6 months after the operation, and also in 6% (n = 3) 1 year after the operation. Postoperative imaging was prescribed only in the event of a postoperative complication in 20% (n = 10) of the cases, without specification of the type of complication.

**Mammary asymmetry correction surgery**

Prescription of preoperative imaging assessment is recommended by 94% (n = 47) and likewise by 94% (n = 47) of the senological radiologists.

Among the plastic surgeons recommending preoperative imaging, in 61% (n = 29) of the cases no minimum age for prescription was indicated. A minimum age for preoperative imaging prescription was set at 20 years by 17% (n = 8), at 30 years by 13% (n = 6), at 35 years by 4% (n = 2), at 40 years by 4% (n = 2) and at 50 years by 2% (n = 1).

Among the radiologists recommending preoperative imaging, in 25% (n = 12) of the cases no minimum age for prescription was indicated. A minimum age for preoperative imaging prescription was set at 20 years by 4% (n = 2), at 30 years by 19% (n = 9), at 35 years by 2% (n = 1) and at 40 years by 49% (n = 23).

**Imagery assessment**

Among the plastic surgeons, imagery assessment including bilateral mammary ultrasound and a mammography was prescribed in 66% of the cases (n = 31). Ultrasound alone was prescribed in 2% of the cases (n = 1) and mammography alone in 27% (n = 13). As regards mammography prescription, two incidences were required in 25% of the cases (n = 12), a single incidence was never requested, and in 66% of the cases (n = 32), the number of incidences was not specified. In 4% of the cases (n = 2), imagery assessment was complemented by MRI.

Among the radiologists, imagery assessment including bilateral mammary ultrasound and mammography was prescribed in 34% of the cases (n = 16). Ultrasound alone was never prescribed and mammography alone was prescribed in 64% of the cases (n = 30). As regards mammography prescription, two incidences were required in 72% of the cases (n = 34), a single incidence was required in 4% (n = 2) and in 21% of the cases (10%), the number of incidences was not specified. In 2% of the cases (n = 1), imagery assessment was complemented by MRI.

When the surgical procedure involved only one breast and imaging was prescribed, all of the plastic surgeons thought that the imaging should be bilateral and comparative. In 96% of the cases (n = 48), the radiologists were in agreement.

Prescription of postoperative imaging was deemed unnecessary by 52% (n = 26) of the plastic surgeons and by 64% (n = 32) of the radiologists. Systematic imaging at 6 months was considered useful by 16% (n = 8) of the plastic surgeons and by 4% (n = 2) of the radiologists. Systematic imaging at 1 year was considered useful by 20% (n = 10) of the plastic surgeons and by 14% (n = 7) of the radiologists. Postoperative imaging was considered useful in the event of a postoperative complication by 6% (n = 6) of the plastic surgeons and by 18% (n = 9) of the radiologists. In no case was the type of complication specified.

**Discussion**

Our study provided objective evidence of several significant differences between plastic surgeons and radiologists specialized in senology as regards imaging prescription in the framework of planned non-tumoral breast surgery. The main divergence pertains to the age starting from which the prescription is given, with the radiologists tending to target patients aged over 40 years.

On the other hand, neither the plastic surgeons nor the radiologists considered systematic postoperative imaging assessment to be useful.

While the objective of several studies has consisted in investigating the interest of preoperative imaging prescription in the framework of non-cancer breast surgery, they have not led to a consensus in attitude [18–22].

A preoperative imaging exam is aimed at detecting potential asymptomatic breast cancer. Only in rare cases does analysis of the tissue removed during breast surgery for reduction allow breast cancer to be objectified [5,6]. To our knowledge, no study has provided indications as to the proportion of breast cancers diagnosed on the occasion of the imaging carried out in the framework of non-cancer breast surgery such as reduction mammoplasty or augmentation by implant placement. In the context of mass screening, the European Society of Breast Cancer Specialists recommends imagery examination only after the age of 40 in cases where no specific risk factor exists, the reason for this restriction being that in women under 40, breast cancer incidence is a rare occurrence [3] (Table 1).

It is legitimate to think that imaging prescription may serve as a complement to usual examination, which would be deemed insufficiently sensitive in screening for
asymptomatic breast cancer. Moreover, the forensic episo-
des generated by failure to screen a breast tumor should
impel a plastic surgeon to readily prescribe a preoperative
imaging exam.

In our experience, a patient is practically never turned
away on account of the fortuitous discovery of a suspect
lesion identified by mammography. Moreover, only in exces-
dingly rare cases does histological analysis of the tissue
fragments removed during breast reduction surgery actually
objectify the existence of breast cancer. It is consequently
of interest to ask ourselves questions on the pertinence
of preoperative imaging examination prescription.

A satisfactorily performed senological investigation can
orient prescription. After all, ultraviolet is more sensitive
than a mammogram on glandular breast tissue.

In all clinical cases, before envisioning an operation it is
necessary that examination results be normal (ACR1 or
ACR2). As a general rule, in the event of an ACR3 lesion
clinical and radiological monitoring is indicated. However,
prior to any surgery the authors remain favorable to per-
formance of a micro biopsy.

A senological clinical examination is of particular interest
in women with mammary prostheses insofar as they render
possible breast cancers are more palpable, whereas the
sensitivity of a mammogram will have diminished (45% versus
66% in women without implants) [7].

Systematic postoperative imagery prescription has been
a subject of discussion on account of the fact that the archi-
tectural distortions of the mammary parenchyma occasioned
by surgery interfere with interpretation of imagery exams in
general, and mammography in particular [8,9]. In fact, this
type of consideration may constitute an argument in favor of
obtaining a reference image at 1 year that will at once be
considered as normal and serve as a reference for later
images.

Several teams have consequently recommended systematic
postoperative imagery at 6 months or at 1 year in order
to provide themselves with a reference image in the framework
of subsequent mammographic follow-up [6,10]. Other teams have
indicated that the modifications of mammary parenchyma
occasioned by breast reduction surgery are unlikely to have
any impact on subsequent mammographic follow-up [9].

Review of the literature shows disagreement as to how
the position of an implant affects sensitivity of the mammo-
gram. According to Meunier et al. [11], its sensitivity is lower
when the implant has been placed prepectorally. Other
teams [7,12] have indicated no significant difference be-
tween the prepectoral and retropectoral positions with
regard to mammography sensitivity.

The breast is a radiosensitive organ [13,14]. As a result,
the long-term consequences of mammograms are difficult to
assess. Up until now, their role in the onset of breast cancer
has yet to be demonstrated, but different studies have
highlighted the impact of repeated mammographic screening
[13,14]. That said, while the risk of breast cancer is not nil, it
remains minimal. Some authors [14] offer assurance that a
risk-benefit balance would tend to favor mammography;
after all, the increased number of breast cancers discovered
through this technique outweigh the number of radiation-
induced cancers that could be attributed to its use.

And so, it would appear preferable to limit breast exams
with irradiation in young women. Moreover, ultrasound
shows higher sensitivity than mammography in young
women, whose breast tissue is frequently glandular [10,15].

Van Der Torre et al., [16] have recommended systematic
mammography in the framework of breast reduction surgery
in women of more than 50 years, the objective being to
screen for asymptomatic breast cancer. As for Hage J.J.
et al. [17], they have recommended preoperative mammo-
graphy from the age of 40. Sergent et al. [10] have stated
that on account of low sensitivity, a mammogram would
serve no purpose prior to the age of 35, which is the age
chosen by the European Society of Breast Cancer Specialists
for mammography prescription.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Probability of developing breast cancer according to age (Breast cancer risk %) [3].</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Risk to have a breast cancer</td>
</tr>
<tr>
<td>&lt; 40 years</td>
<td>1/218</td>
</tr>
<tr>
<td>40—49 years</td>
<td>1/62</td>
</tr>
<tr>
<td>50—59 years</td>
<td>1/40</td>
</tr>
<tr>
<td>60—69 years</td>
<td>1/26</td>
</tr>
<tr>
<td>70—79 years</td>
<td>1/23</td>
</tr>
<tr>
<td>&gt; 70 years</td>
<td>1/14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Proposed guidelines for prescription of preoperative imaging assessment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Exam</td>
</tr>
<tr>
<td>Breast augmentation</td>
<td>&lt; 40 years</td>
</tr>
<tr>
<td></td>
<td>&gt; 40 years</td>
</tr>
<tr>
<td>Breast reduction</td>
<td>&lt; 30 years</td>
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<tr>
<td></td>
<td>From 30 to 40 years</td>
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<tr>
<td></td>
<td>&gt; 40 years</td>
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<tr>
<td>Breast asymmetry</td>
<td>&lt; 30 years</td>
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<tr>
<td></td>
<td>From 30 to 40 years</td>
</tr>
<tr>
<td></td>
<td>&gt; 40 years</td>
</tr>
<tr>
<td>Esthetic lipomodeling of the breasts</td>
<td>&lt; 30 years</td>
</tr>
<tr>
<td></td>
<td>From 30 to 40 years</td>
</tr>
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<td></td>
<td>&gt; 40 years</td>
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</tbody>
</table>
Table 3  Proposed guidelines for imagery assessment prior to breast reconstruction.

<table>
<thead>
<tr>
<th>Reconstruction side</th>
<th>Age</th>
<th>Exams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contralateral side</td>
<td>At all ages</td>
<td>Ultrasound ± MRI (if hard to interpret)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ultrasound ± MRI (if hard to interpret or breast at very high risk)</td>
</tr>
</tbody>
</table>

Table 4  Proposed guidelines for prescription of postoperative imagery assessment.

<table>
<thead>
<tr>
<th>Breast augmentation</th>
<th>Age</th>
<th>Exams</th>
<th>Postoperative time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 40 years</td>
<td>None or ultrasound</td>
<td>1 year</td>
</tr>
<tr>
<td></td>
<td>&gt; 40 years</td>
<td>Mammogram + ultrasound</td>
<td>1 year</td>
</tr>
<tr>
<td>Breast reduction</td>
<td>&lt; 30 years</td>
<td>None</td>
<td>1 year</td>
</tr>
<tr>
<td></td>
<td>From 30 to 40 years</td>
<td>Mammogram + ultrasound</td>
<td>1 year</td>
</tr>
<tr>
<td></td>
<td>&gt; 40 years</td>
<td>Mammogram + ultrasound</td>
<td>1 year</td>
</tr>
<tr>
<td>Breast asymmetry</td>
<td>&lt; 30 years</td>
<td>None or Ultrasound</td>
<td>1 year</td>
</tr>
<tr>
<td></td>
<td>From 30 to 40 years</td>
<td>None or Ultrasound</td>
<td>1 year</td>
</tr>
<tr>
<td></td>
<td>&gt; 40 years</td>
<td>Mammogram + Ultrasound</td>
<td>1 year</td>
</tr>
<tr>
<td>Esthetic lipomodeling of the breasts</td>
<td>&lt; 30 years</td>
<td>Ultrasound</td>
<td>1 year</td>
</tr>
<tr>
<td></td>
<td>From 30 to 40 years</td>
<td>Mammogram (1 incidence) + ultrasound</td>
<td>1 year</td>
</tr>
<tr>
<td></td>
<td>&gt; 40 years</td>
<td>Mammogram + Ultrasound</td>
<td>1 year</td>
</tr>
</tbody>
</table>

Table 5  Proposed guidelines for prescription of postoperative imagery assessment in the event of breast reconstruction.

<table>
<thead>
<tr>
<th>Reconstruction side</th>
<th>Age</th>
<th>Exams</th>
<th>Postoperative time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contralateral side</td>
<td>At all ages</td>
<td>Ultrasound ± MRI (if hard to interpret)</td>
<td>1 year</td>
</tr>
<tr>
<td></td>
<td>At all ages</td>
<td>Mammogram + ultrasound ± MRI (If hard to interpret or breast at very high risk)</td>
<td>1 year (yearly assessment)</td>
</tr>
</tbody>
</table>

Analysis of the literature does not render possible the elaboration of a fully readable and reliable algorithm regulating prescription of preoperative imaging assessment preceding non-tumoral breast surgery in the absence of any specific risk factor for breast cancer. When no such risk exists, preoperative imaging appears to be of only limited interest [3] prior to the age of 40. Before reaching that age, mammary ultrasound should be preferred; it does not involve potentially dangerous radiation, and is highly sensitive. After the age of 40, on the other hand, imagery would appear more justified insofar as breast cancer prevalence is higher. Screening is essentially based on performance of complete mammography (two incidences) interpreted by experienced radiologists and submitted to double reading.

We are recommending guidelines regulating the prescription of mammary imagery exams to be performed according to the patient’s age prior to a plastic surgery procedure (Tables 2 and 3). A proposal for guidelines liable to regulate prescription of postoperative exams would also be of considerable use (Table 4). Preoperative imagery assessment has nonetheless got to be adapted to each patient [23]. For example, a radiologist may carry out mammography (one, if not two incidences) in a patient aged less than 35, provided that he deems initial ultrasound to have been insufficiently conclusive.

Analysis of the literature does not steer us in the direction of a single attitude pertaining to monitoring of a reconstructed breast (following total mastectomy). Since the rare relapses are not necessarily accessible to clinical examination, we are also putting forward a guideline for prescription of imagery assessment when a reconstructed breast is being monitored (Table 5).

Conclusion

As of 2012, prescription of preoperative imaging assessment in the framework of non-carcinologic breast surgery in patients presenting no risk factor for breast cancer was not the object of a consensus in France.

The minimum age for prescription of preoperative imaging exams ranges according to medical from 35 to 40 years. These ages are related to breast cancer prevalence, which grows higher from 40 years onward. Close cooperation bringing together senological radiologists and plastic surgeons is likely to facilitate harmonization of their respective practices. The guidelines we have proposed could help them to synchronize their efforts.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.
Preoperative imaging prior to breast reconstruction surgery. Proposed guidelines

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