



Original article

Multidisciplinary team meeting and EUSOMA quality indicators in breast cancer care: A French regional multicenter study

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ABSTRACT

Introduction: We evaluate breast cancer (BC) pathway at a regional level including public, private and university institutions. We assessed the quality of multidisciplinary team meetings (MTM) and compliance with a panel of European high-quality indicators (EUSOMA QIs).

Methods: We conducted a retrospective multicenter (n = 20) study in the largest health care region in France. Between January and April 2015, we included all patients discussed at an MTM after a diagnosis of BC (n = 619). We analyzed quality of MTM by assessing the quorum, the reliability of data transcription and the exhaustivity of pre-therapeutic MTM. We then analyzed the compliance with a selected panel of 16 EUSOMA QIs.

Results: During MTM discussion, data were more than 95% consistent with medical records for 9/11 items. Pre-operative tumor histology (90.6%) and post-operative resection margins (84.3%) were the least concordant between medical records and MTM. Minimum standards as defined by EUSOMA were reached for 11/16 QIs, but not reached for pathology reports in non-invasive BC (78.2%), proportion of exclusive sentinel lymph node biopsies in patients with clinically negative axilla (85.2%), performing adjuvant chemotherapy (76.6%), and proportion of patients discussed in pre-therapeutic and post-operative MTM (63.5%).

Conclusions: In this multicentric study evaluating the quality of BC care with a representative sample of institutions, compliance with EUSOMA indicators was satisfactory for all type of institutions. However, too few patients were discussed in pre-therapeutic MTM (especially in non-university hospitals 43.7% [39.4–48.1]) versus 88.7% for others [82.2–95.1]) and data transcription was likely responsible for up to 15% of discordance.

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Introduction

Early breast cancer (BC) care is complex and includes several steps for each patient from screening to diagnosis to obtain a

personalized treatment plan potentially combining loco-regional therapy (surgery and/or radiotherapy (RT)) and systemic therapy (chemotherapy, targeted therapy and endocrine therapy) [1,2]. Over the past decade, cancer has increasingly been treated by centralized and specialized multidisciplinary teams in Western countries, involving many healthcare specialists (included radiologists, pathologists, surgeons, oncologists, radiotherapists, and primary care) [3,4]. It is now widely accepted that multidisciplinary team meetings (MTM) ensure higher quality of care and improved survival in BC

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[5–7]. Their purpose is to discuss the overall care of patients and to establish a plan for diagnosis, treatment and follow-up. The French Cancer Control Plan (2014–2019) laid down a set of measures to give each and every person the same chances of recovery and to use innovative techniques for patients' benefit [8]. For BC patients, this means having a medical oncologist, an adapted information system, MTM, an individualized care plan in writing, good practice guidelines, access to supportive care and access to innovation and clinical studies [9]. In France, care for BC patients is administered by the comprehensive cancer centers (CCC) or university hospital centers (UHC), local hospitals and private clinics, representing nearly one-third each [9]. Physicians involved in the cancer care pathway from diagnosis to treatment often do not work in the same institution, so one of the challenges is to coordinate care efficiently [10]. Therefore, patients' data must be shared so that appropriate MTM decisions may be taken. The regional cancer communication file (RCCF) is a digital medical file designed to become the standard instrument for data sharing in oncology by making reliable clinical data available and accessible for any physician involved in cancer care. Medical decision-making in MTM is therefore based on information included in this RCCF, filled in manually from medical records and thus subject to transcription errors.

Evaluation of the quality of BC care pathway is variable regarding screening, diagnosis, treatment and follow-up [11,12]. In Europe, recommendations exist regarding the harmonization of the quality of BC care [1,2]. The European society of breast cancer specialists (named EUSOMA) includes specialists in different aspects of BC [13]. They have set benchmark quality indicators (QIs) for the minimum standard of care covering diagnosis, staging, loco-regional treatment, systemic treatment, follow-up and rehabilitation [14]. These QIs were updated in 2017 to incorporate new knowledge in the field [15,16]. Recent studies have demonstrated that the EUSOMA QIs are efficient for evaluating quality of care in routine practice and could be used as tools for improving quality

[17–20].

We conducted a retrospective multicenter analysis of quality of care in the early BC pathway in real-life access to cancer care including all institutions involved in BC care in the largest French metropolitan region: one CCC/UHC, 8 non-for-profit local hospitals and 11 private clinics. First, we assessed the quality of MTM, by evaluating the quorum, the reliability of medical information transmitted from medical records to RCCF, and the exhaustivity of pre-therapeutic MTM. Next, we investigated whether access to BC care at the regional level responded to a panel of high-quality EUSOMA indicators regarding diagnosis, loco-regional treatment and systemic therapy.

Methods

Study design and population

This was a retrospective observational study including patients newly diagnosed with an early BC and discussed in pre- and/or post-therapeutic MTM between January 1st, 2015 and April 30th, 2015. MTM took place in one of the authorized hospitals for cancer treatment within a defined regional health territory (Midi-Pyrenees, the largest region in metropolitan France in terms of surface area, with 2.5 million inhabitants). Patients were treated by 8 not-for-profit local hospitals, 11 private clinics and one CCC/UHC. In the health territory studied, the CCC/UHC alone achieves 40% of the MTM for BC patients. It was the only institution to discussed more than 100 patients at MTM during our study period. Thus, since our main objective was to evaluate global access to BC care, and in order to optimize data collection, we selected all cases in the 19 centers with [10–100] patients presented at MTM, but only one in four (randomly selected) from the CCC/UHC (Fig. 1). Metastatic patients, those with an antecedent of BC and those discussed by a multi-disciplinary team that discussed too few patients (fewer than 10

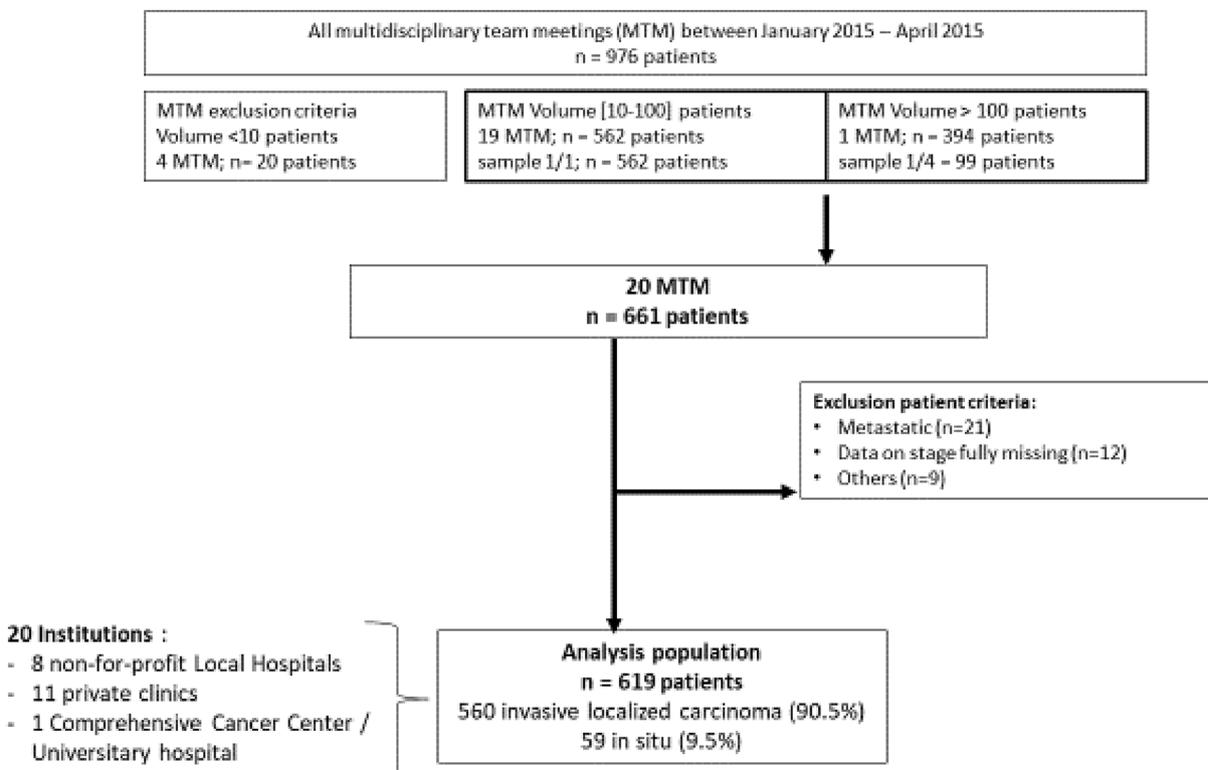


Fig. 1. Flow chart.

during this period) were excluded. All data were anonymized. The database was built from retrospective data directly collected within institutions, derived from medical records, MTM reports, and RCCF. The study was managed by the regional oncology network Onco-mip. The database was built in compliance with French regulations (CNIL N° DR-2014-495 et CCTIRS N° 14.192).

Variables of interest

The following variables were collected: age, personal and familial antecedent of breast or ovarian cancer, clinical and pathologic tumor size and lymph node involvement, histology and tumor grade, estrogen receptor (ER) and progesterone receptor (PR) (positive if $\geq 10\%$ of tumor cells expressed receptors), human epidermal growth factor receptor 2 (HER2) status (categorized as positive or negative according to ASCO guidelines [21]). Modalities of loco-regional imaging were collected (magnetic resonance imaging (MRI), mammography, breast ultrasonography). Treatment modalities were retrieved: breast surgery (breast conservative surgery (BCS) or mastectomy) and axillary node surgery (axillary lymph node dissection or sentinel lymph node biopsy (SLNB)), re-excision, RT and systemic therapy (chemotherapy, endocrine therapy or targeted anti-HER2 therapy), date of beginning and ending of each treatment, institutions for each modality. Information concerning pre- and/or post-operative MTM were retrieved: quorum (number and specialty of physicians), demographic, antecedent and pathology data recorded for the discussion in the RCCF.

Quality indicators

We first analyzed the quality and reliability of MTM by defining items concerning exhaustivity of pre-therapeutic MTM, quorum of pre-therapeutic and post-operative MTM, and the concordance of data between RCCF and medical records. Discordant data corresponded to a real discrepancy between RCCF and medical records or lack of data in RCCF. QIs were established from regional, national and international guidelines by a regional multidisciplinary panel of BC experts evaluating the reliability, relevance and feasibility of each indicator. Using these data, we compared our results with a panel of EUSOMA QIs: 5 concerned diagnosis, 8 loco-regional treatment and 3 systemic treatment (described in Table 4). For each QI, EUSOMA sets a minimum standard to be a BC referral center, and a target to reach for improving quality of care. For some indicators, reaching the minimum standard is mandatory, whereas others are only recommended [15]. Next, we analyzed the compliance with a panel of EUSOMA QIs according to the MTM volume of patients (group [10–100] versus >100 patients).

Statistical analysis

Difference in sampling rate between centers was considered in the statistical analysis using a weighting. The sample was stratified by using the svyset command to identify the survey design characteristics. Qualitative variables were described as numbers (non-weighted) and percentages after weighting, with their confidence intervals (95% CI). All data analysis was performed using STATA software v11.

Results

Study population and treatments features

Among the 619 patients included, 560 (90.5%) had an invasive carcinoma and 59 (9.5%) an *in situ* carcinoma (Fig. 1). All the patient and tumor characteristics, details of treatment and loco-regional

imaging are summarized in Table 1. The mean age of patients with invasive carcinoma was 61 (± 14), 91.5% had a tumor size $\leq T2$, 63.9% had no pathological lymph node involvement, and 76.9% had

Table 1
Patient, tumor and treatment characteristics for localized invasive/*in situ* breast carcinoma.

	Invasive carcinoma (n = 560)		<i>In situ</i> carcinoma (n = 59)	
	n ^a	% ^b	n ^a	% ^b
Patient and tumor characteristics				
Age (mean \pm SD)	560	61 \pm 14	59	60 \pm 9
Pathological tumoral size				
Tis		0		100
$\leq T2$		91.5		0
$> T2$		7.6		0
Missing		0.9		0
Pathological lymph node involvement				
N0	537	63.9	25	100
N+		35.6		0
Missing		0.5		0
Histology on biopsy				
Ductal	536	76.9	56	68.3
Lobular		12.1		8.9
Others		10.2		22.8
Missing		0.8		0
ER status				
Positive	514	83.4	NA	NA
Negative		16.6		
PR status				
Positive	515	64.5	NA	NA
Negative		35.5		
HER2 status				
Positive	515	11.7	NA	NA
Negative		76.1		
Unknown		12.2		
Loco-regional imaging				
MRI				
Yes	560	30.0	59	30.8
No		70.0		69.2
Echography				
Yes	560	78.3	59	68.2
No		3.8		5.6
Missing		17.9		26.2
Mammography				
Yes	560	77.4	59	76.6
No		2.0		3.7
Missing		20.6		19.6
Treatment characteristics				
Frontline treatment				
Neo-adj. (chemo/HT)	560	7.6	59	0
Surgery		89.6		99.1
Exclusive medical/RT		2.5		0.9
No treatment		0.3		0
Frontline surgery				
BCS	543	79.2	58	84.0
Mastectomy		20.8		16.0
Axillary node surgery				
SLNB	560	69.2	59	42.4
And/Or LND		41.7		0.9
None		0.3		57.0
Adjuvant chemotherapy				
Yes	560	38.7	59	0
No		60.7		100
Missing		0.6		0
Adjuvant Radiotherapy				
Yes	560	92.1	59	72.0
No		7.2		28.0
Missing		0.7		0.0
Timing of MTM				
Pre-therapeutic MTM only	560	2.5	59	1.9
Post-operative MTM only		37.2		21.5
Both pretherapeutic and post-operative MTM		59.4		76.6
Post initiation medical treatment MTM only		0.9		0.0

Table 1 (continued)

	Invasive carcinoma (n = 560)		<i>In situ</i> carcinoma (n = 59)	
	n ^a	% ^b	n ^a	% ^b
Same institution between				
Biopsy- Surgery	483	44.7	55	55.0
Surgery-Adj. CT	183	75.7	0	NA
Surgery-Adj. RT	465	43.8	45	47.4
Biopsy-Neo adj. CT	33	33.3	0	NA
Neo adj. CT-Surgery	33	72.2	0	NA

Abbreviations N number of patients; IS *in situ*; SD Standard deviation; ER Estrogen receptor; PR progesterone receptor; HER2 human epidermal growth factor receptor 2; MRI magnetic resonance imaging; HT hormonal therapy; RT radiotherapy; CT chemotherapy; SLNB sentinel lymph node biopsy; LND lymph node dissection; Neo-adj. neo-adjuvant therapy; NA not applicable.

^a Non-weighted values.

^b All percentages are weighted.

a ductal carcinoma. Frontline mastectomy was performed in 20.8% of patients with invasive carcinoma and in 16.0% of patients with *in situ* carcinoma. SLNB was performed in 69.2% of patients with invasive carcinoma and in 42.4% of patients with *in situ* carcinoma. Among patients with invasive BC, 56.2% received surgery and adjuvant RT in different institutions, 24.3% for those who received surgery and adjuvant chemotherapy. According to the inclusion criteria, all patients had been discussed at least once in MTM. For invasive carcinoma, 2.5% before any treatment only, 37.2% after surgical treatment only, 59.4% both before the first treatment and after the surgery, and for 0.9% of the patients, the discussion took place after treatment initiation.

Quality of multidisciplinary team meetings

Reliability of the data transcription between medical records and RCCF is presented in Table 2. Regarding pathology reports, information was concordant above 95% for 9 indicators out of 11. Pre-operative tumor histology (90.6% of concordant data [86.0–95.1]) and post-operative resection margins (84.3% of concordant data [79.1–89.4]) were the most likely to be discordant or missing. Information on breast and/or ovarian familial antecedent was discordant or missing in 52.7% of files.

We next analyzed the quorum of pre-therapeutic and post-

operative MTM. A minimum of three physicians from different specialties attended more often in post-operative MTM than in pre-therapeutic MTM (91.0% [88.2–93.7] versus 75.5% [68.9–82.0]). Regarding exhaustivity of pre-therapeutic MTM (Table 3), among all patients diagnosed with an early BC (n = 619), 63.9% [59.5–68.2] were discussed at an MTM before any treatment, and 91.8% [84.1–99.5] of those who received a frontline systemic therapy (n = 37). Among patients who underwent frontline mastectomy (n = 120), 68.9% were previously discussed at an MTM [59.6–78.2].

Compliance with EUSOMA indicators

We then examined the data available for our population in the light of a panel of EUSOMA QIs (Table 4). Minimum EUSOMA standards were reached for 3/5 indicators regarding diagnosis, 6/8 indicators regarding loco-regional treatment, and 2/3 indicators regarding systemic treatment.

Regarding diagnosis, MRI was performed in 28.1% [23.0; 33.2] of all cancer cases, and in 64.8% [42.7; 86.9] of patients who underwent primary systemic therapy (i.e. above the recommended minimum EUSOMA standards of 60% but below the target threshold of 90%). Regarding pathology reports, minimum standards were at the limit of being reached for invasive cancer (94.2% [91.6; 96.7] for a minimum standard above 95%). However, for non-invasive cancer, only 78.2% [64.6; 91.8] of records contained complete information (for a minimum standard above 95%), though this concerned only 56 patients.

Regarding surgery and loco-regional treatment, appropriate surgical approach and avoidance of overtreatment objectives were reached for all QIs except for the proportion of patients clinically NO who underwent exclusive SLNB (85.2% [79.9; 90.6] for a minimum standard of 90%). The proportion of patients discussed pre- and post-operatively at an MTM was under the minimum standard (63.5% [59.0; 67.9], n = 593) because of the small number of patients systematically discussed in pre-therapeutic MTM.

Regarding systemic therapy, the proportion of patients who received endocrine therapy and trastuzumab was above the mandatory threshold. However, this was not the case for the proportion of ER-negative patients, with a positive lymph node involvement and/or tumor size above 1 cm, who received adjuvant chemotherapy (76.6% [62.0; 91.3] versus a minimum standard of 85%, though this concerned only 56 patients. However, this threshold was reached for patients younger than 65 yr (97.8% [93.2;

Table 2

Reliability of data transcription between medical records and regional cancer communication file.

	No. patients ^a	Proportion of concordant data between RCCF and medical records, % ^b [IC 95%]
Age	619	99.9 [99.7–100]
Breast/Ovarian familial cancer antecedent	194	47.3 [38.4–56.1]
Pathology of pre-operative biopsy (pre-therapeutic MTM)^c		
- Histology	317	90.6 [86.0–95.1]
- Grade	274	96.8 [93.9–99.8]
- ER status	275	96.0 [92.7–99.3]
- HER2 status	275	95.2 [91.8–98.6]
Pathology of breast surgery (post-operative MTM)^c		
- Histology	585	96.2 [94.2–98.2]
- Grade	507	97.9 [96.0–99.8]
- ER status	534	98.6 [97.4–99.8]
- HER2 status	533	96.8 [95.2–98.3]
- pT	518	97.5 [95.8–99.2]
- pN	529	95.7 [93.5–98.0]
- Margins after tumorectomy	424	84.3 [79.1–89.4]

Abbreviations: RCCF regional cancer communication file; ER estrogen receptor; pT pathological tumor size; pN pathological lymph node involvement; CI confidence interval.

^a Non-weighted values.

^b All proportions are weighted.

^c Analyze limited to localized infiltrating cancers for grade, ER status, HER2status, pN and margins.

Table 3
Proportion of patients discussed in pre-therapeutic MTM regarding their characteristics.

	No. patients ^a	Proportion of patients discussed Pre-therapeutic MTM % ^b [CI 95]
Invasive or <i>in situ</i> carcinoma	619	63.9 [59.5–68.2]
Primary systemic treatment	37	91.8 [84.1–99.5]
Inflammatory tumor	10	100
First mastectomy	120	68.9 [59.6–78.2]

Abbreviations: MTM Multidisciplinary team meeting; n number of patients; CI95 confidence interval.

^a Non-weighted values.

^b All proportions are weighted.

Table 4
Compliance with EUSOMA quality indicators.

Indicator	n ^a	Our population (% ^b)	Minimum standard EUSOMA	Target EUSOMA	Mandatory (M) Recommended (R)	Level of evidence
Diagnosis						
<i>Preoperative diagnosis</i>						
Proportion of women with breast cancer (invasive or <i>in situ</i>) who had a preoperative histologically or cytologically confirmed malignant diagnosis	614	95.5 [93.3; 97.7]	85%	90%	M	III
<i>Completeness of prognostic/predictive characterization</i>						
Proportion of invasive cancer cases for which the following prognostic/predictive parameters have been recorded: histological type, grading, ER and PR, HER2. (Ki67 recommended but not mandatory)	536	94.2 [91.6; 96.7]	>95%	>98%	M	II
Proportion of non-invasive cancer cases for which the following prognostic/predictive parameters have been recorded: grading, histological pattern, distance to nearest margin, size. (ER status excluded)	56	78.2 [64.6; 91.8]	>95%	>98%	M	II
<i>MRI availability</i>						
Proportion of cancer cases examined preoperatively by MRI (excluding patients treated with PST)	506	28.1 [23.0; 33.2]	10%	NA	R	IV
Proportion of patients treated with PST undergoing MRI Surgery and Loco-regional treatment	33	64.8 [42.7; 86.9]	60%	90%	R	III
<i>Multidisciplinary discussion</i>						
Proportion of cancer patients to be discussed pre- and postoperatively by a multidisciplinary team	593	63.5 [59.0; 67.9]	90%	99%	M	III
<i>Appropriate surgical approach</i>						
Proportion of patients (invasive cancer only) who received a single breast operation for the primary tumor (excluding reconstruction)	543	88.1 [84.6; 91.6]	80%	90%	M	II
Proportion of patients (in situ only) who received just one operation (excluding reconstruction)	58	78.3 [65.2; 91.4]	70%	90%	M	II
<i>Post-operative RT</i>						
Proportion of patients with invasive breast cancer who received postoperative RT after BCS	396	97.5 [94.6; 99.0]	90%	95%	M	I
<i>Avoidance of overtreatment</i>						
Proportion of patients with invasive cancer and clinically negative axilla who underwent SLNB only (excluding patients who received PST)	269	85.2 [79.9; 90.6]	90%	95%	M	I
Proportion of patients with invasive cancer who underwent SLNB with no more than 5 nodes excised	313	95.9 [94.0; 97.8]	90%	95%	R	I
Proportion of patients with non-invasive breast cancer ≤ 2 cm who underwent BCS	28	96.1 [90.4; 100]	80%	90%	M	II
Proportion of patients with DCIS only who do not undergo axillary clearance	36	98.6 [95.5; 100]	97%	99%	M	II
Systemic treatment						
<i>Appropriate endocrine therapy</i>						
Proportion of patients with endocrine-sensitive invasive cancer who received endocrine therapy	438	89.0 [85.4; 92.7]	85%	90%	M	I
<i>Appropriate chemotherapy and HER2-targeted therapy</i>						
Proportion of patients with ER- (T>1 cm or N+) invasive carcinoma who received adjuvant chemotherapy	56	76.6 [62.0; 91.3]	85%	95%	M	I
Proportion of patients with HER2-positive (3 + or FISH+) invasive carcinoma (T>1 cm or N+) treated with chemotherapy who received adjuvant trastuzumab	27	93.3 [85.1; 100]	85%	95%	M	I

^a Non-weighted number.

^b All percentages are weighted.

100]), whereas only 46.9% [19.8; 73.9] of patients older than 65 yr received adjuvant chemotherapy (*data not shown*).

We next analyzed the compliance with EUSOMA QIs according to the MTM volume of patients (group [10–100] versus >100 patients) (description of the two groups were available in

Supplementary Table 1). Seven EUSOMA QIs could not be included because of too few patients. There was no differences for studied EUSOMA QIs between the two groups, excepted for the proportion of patients discussed pre- and postoperatively by a multidisciplinary team (43.7% [39.4–48.1] for MTM volume with less than

100 patients, versus 88.7% [82.2–95.1] for MTM volume patients >100) (Supplementary Table 2).

Discussion

We conducted a regional multicenter study to evaluate the quality of BC care in all public, private and university institutions accredited to provide it in the largest region in metropolitan France. To our knowledge, this study is the first to incorporate the reliability of the data transcription on which MTM decisions were taken, in addition to data on the quorum and exhaustivity of MTM. Concordance with pathology reports exceeded 95% on 9 out of 11 items, but was 90.6% and 84.3% for pre-operative histology and post-operative margins. These findings are important because they could potentially impact medical decision-making, especially regarding indications for re-excision. They are particularly relevant in the framework of a large regional health-care network where physicians from different workplaces work together: as fewer than half of the patients received all their treatment in a single institution.

We examined the data available for our population in the light of a panel of EUSOMA QIs because there are a clinically pertinent way to evaluate the BC care pathway, including all steps from diagnosis to loco-regional and systemic therapy. Among previous studies using EUSOMA QIs to evaluate quality of care in routine practice, some only evaluated EUSOMA-certified BC centers [17,19,20,22] while others evaluated only pre-operative QIs [18]. We could not analyze all EUSOMA QIs (a total of 34 items grouped in 17 QIs, available in Biganzoli et al. [15]) because of non-collected data. Especially regarding counseling, follow-up and rehabilitation, no QIs could be analyzed. However, we were able to analyze QIs for each of the three major sections: diagnosis, loco-regional treatment and systemic therapy. BC care was found to be compliant with 11 out of 16 EUSOMA indicators.

The comparison with EUSOMA QIs highlights the need for improvement. First, regarding pathology reports, some items were missing for 21.8% of patients with non-invasive BC. Of note, we did not analyze ER status because it had no impact on routine clinical practice in non-invasive carcinoma in 2015 and was not mandatory in previous EUSOMA QIs. Regarding axillary surgery, 85.2% [79.9; 90.6] of patients with clinically negative axilla underwent exclusively SLNB (lower than the mandatory 90% in EUSOMA guidelines 2010 [14]), despite the fact that SLNB is considered as standard care in BC surgery in patients with no clinical evidence of lymph node involvement [2,14]. Regarding type of surgery, 72.4% underwent exclusively BCS, with a rate of reoperation below the minimum standard. This is in the same range as that obtained in 13 European BC units between 2003 and 2010 (73.3%) [22]. Finally, the proportion of patients who received chemotherapy for ER-negative tumors larger than 1 cm and/or with lymph node involvement was lower than the mandatory 85% EUSOMA recommendation. However, our real-life analysis included elderly patients of whom 11% were older than 80 years. Even though age itself is not a contra-indication for treatment, a different approach could have been decided for the oldest. For instance, 41.6% of patients likely to receive adjuvant chemotherapy were older than 65 years; of these, 53.1% did not receive it (*data not shown*). In the group of patients under 65 years old, 97.8% received chemotherapy. Co-morbidities and the wishes of patients may have affected their decision, but these factors were not evaluated in the study.

One of the EUSOMA QIs that we did not study was the completeness of clinical and imaging diagnostic work-up, defined as the proportion of patients who preoperatively underwent mammography, physical examination and echography of both breasts and axilla [15]. As we could not evaluate the physical

examination, we did not include it, although we had information on loco-regional imaging (Table 1). Furthermore, only 77% and 78% of patients with invasive carcinoma had data on a mammography and an ultrasound in their medical records, respectively. Since 18–21% of data were missing, we need to improve the traceability of imaging data in the medical records. This is particularly crucial because 55.9% of patients did not undergo biopsy and surgery in the same institution (Table 1).

International consensus conferences recommend that multidisciplinary teams select the optimal treatment based on patient- and tumor-related factors. The benefits of MTM in terms of shared decision-making regarding treatment options and the contribution to improved survival (with an 18% lower BC mortality at 5-year) have already been demonstrated [6,23]. However, in our study, among patients discussed at least once in MTM, only 63.5% were discussed both in pre- and post-operative MTM. The EUSOMA QI threshold is stringent for this criterion, since 90% of patients should be discussed at both MTM. It appears in our additional analyses that CCC/UHC applied this criterion in their guidelines, which was not the case for others institutions (88.7% [82.2–95.1] versus 43.7% [39.4–48.1]). This result could be expected, as pre-operatively discussion was recommended but not mandatory by our regional guidelines at the time of the analysis, but reserved for complex cases more favorable to be discussed at CCC/UHC whatever their first origin. The complexity of decision-making process in the surgical management of early BC should be discussed in pre-therapeutic MTM so that alternatives to surgical first-line treatment may be found. In the last decade, the indications for neo-adjuvant therapies have become more numerous, especially for triple-negative (defined as ER, PR and HER2-negative tumors) and HER2-positive tumors [24]. Neo-adjuvant therapies could be used to downstage a locally advanced and inoperable tumor to resectable disease, or to convert a mastectomy to a BCS option [25]. In our study, first radical mastectomy was performed in 20.8% of patients, 32.3% of whom were not discussed in a pre-therapeutic MTM. It will be of interest to specifically study the impact of pre-therapeutic MTM on therapeutic decision in our cohort, because some women may not be offered BCS despite being good candidates for neo-adjuvant therapy [26].

This study has several limitations. Even if the medical records and the RCCF allowed access to a range of data about all the patients including their customized care plan, information from the MTM, pathology reports and surgery reports, some information was not collected. Our collected data were not specifically designed to be compared to EUSOMA QIs, so we were not able to study all of them, especially those regarding staging procedure, follow-up and nurse counseling. Next, our data were collected in 2015, and compared to EUSOMA QIs defined in 2010, but actualized in 2017. Improvements may have been made since 2015. Moreover, we did not include all newly patients diagnosed with early BC, but only patients discussed at an MTM. This could induce a selection bias, because this population is perhaps more suitable for treatment based on the guidelines. This could partly account for our satisfactory results [23].

The study also has a major strength in that all types of BC care institutions were included, thus representing the real-life access to cancer care establishments in a large region. Though this concerned only 9 criteria, there was no differences between CCC/UHC and all other institutions regarding compliance with EUSOMA QIs except for pre-therapeutics MTM, discussed above. It is important to keep in mind that more than half of the patients change institutions during their BC care pathway (Table 1), thus separate analysis between CCC/UHC and other institutions must be interpreted cautiously. It highlighted the importance of a national cancer plan and an efficient network of cancer units. Our region was interesting to study because of its heterogeneity in terms of population density,

including the fourth largest city in France (Toulouse), and some of the most sparsely populated territories in France with fewer than 30 inhabitants/km². Owing to geographical and demographical disparities, BC-related care pathways and structures at the regional level may be presumed to be heterogeneous, even though we did not evaluate these differences in this study. Not all patients could be treated in the same institution for reasons of geographical remoteness, so it is important to optimize data-sharing between all the institutions involved in BC care.

Conclusion

To our knowledge, this study is the first to examine the reliability of the data transcription on which MTM decisions are made. Up to 15% of pathology data regarding post-operative resection margins were missing or discordant. The impact on medical decision-making must be evaluated, and actions must be taken to make RCCF data more reliable. Compliance was reached for two-thirds of EUSOMA indicators concerning diagnosis, loco-regional treatment and systemic treatment. Improvements need to be made regarding discussion in pre-therapeutic MTM and the wider use of sentinel lymph node biopsies.

Declarations

The database was built in compliance with French regulations (CNIL (*Commission Nationale de l'Informatique et des Libertés*) N° DR-2014-495 et CCTIRS (*Comité Consultatif sur le Traitement de l'Information en matière de Recherche dans le domaine de la Santé*) N° 14.192).

Consent for publication: Not applicable.

Ethics approval and consent to participate

The EVASEIN project was approved by national ethics committee (*Comité Consultatif sur le Traitement de l'Information en matière de Recherche dans le domaine de la Santé*), and declared to the Commission Nationale de l'Informatique et des Libertés (N° DR-2014-495).

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Authors' contributions

EPT, JLL and CV have drafted the work and have made contributions to the design of the work. LDM and PGC interpreted the data, have made contributions to the design of the work, and revised the manuscript. EB, YB, CBM have revised the manuscript and contributed to the conception of the work.

EOM, JG, CD, LS, CM, CL have made contributions to the acquisition and analysis of the data.

Conflicts of interest

Authors have no conflict of interest to declare.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.breast.2019.06.001>.

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