PS2-01-22 Changes in Reoperation Rate After Publication of Guidelines Defining Positive Margins for Breast-Conserving Surgery: A Collaborative Study of the Japanese Breast Cancer Society

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Introduction

In 2014, the SSO-ASTRO consensus guidelines redefined **a positive margin requiring re-excision after breast-conserving surgery (BCS) as "tumor on ink."** This standard has been reported internationally to significantly reduce surgical re-excision rates. In Japan, it was explicitly incorporated into the **2018 Japanese Breast Cancer Society clinical practice guidelines**. To clarify **changes in re-excision rates before and after guideline publication** in Japan, we conducted a multicenter collaborative study.

Methods and Materials

Questionnaire Survey: A nationwide questionnaire was distributed to representatives of 521 Japanese Breast Cancer Society-accredited institutions to assess current BCS-related practices, including imaging, surgical and pathological assessment, rates of positive margins, and re-excision.

Multicenter Cohort Study : A multicenter cohort study was performed using databases from seven participating institutions, examining trends in positive margin and re-excision rates among patients undergoing BCS from 2008 to 2022.

Results of Questionnaire Survey

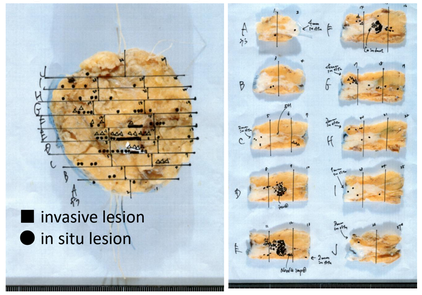
262 of 521 Japanese Breast Cancer Society-accredited institutions responded (55.7%).

- 60% institutions performed 100 to 300 breast surgeries annually.
- 89% facilities had full-time pathologists.
- Preoperative **MRI was used in 97%** of cases for disease extent assessment.
- 94% of facilities sliced all BCS specimens at 5 mm intervals for pathological evaluation.
- **Cancer mapping (Fig. 1) was routinely drawn up at 78%** of facilities
- 23% of facilities performed tissue mammography for all cases and 55% perform it for calcification cases

Table 1:Transition of positive margins and re-resection rates

		Pre Jp GL -2018	Post Jp GL 2019-
Positive rate of surgical margin	0-10%	46.6%	63.4%
	11-20%	15.3%	16.8%
	21-30%	57%	3.1%
	30%	2.3%	2.3%
	unknown	30.2%.	14.5%
Re-excision rate following a positive margin diagnosis	0-10%	44.7%	49.2%
	11-30%	22.1%	20.6%
	31-50%	12.6%	11.1%
	51-75%	9.5%	7.3%
	75%-	11.1%	11.8%

Fig. 1 Cancer Mapping



Results of Multicenter Cohort Study in Seven Facilities in Japan

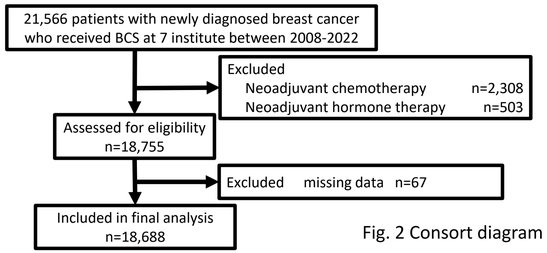


Fig. 2 Consort diagram

Table 2: Comparison of Demographic by Time Period

	Overall N=18688	Pre(2008-14) n=9174	Post(2015-22) n=9511
Age(Median, Range)	54.0 (46.0-64.0)	53.3, 46.0-63.2	54.0, 47.0-65.0
Pre menopause	8520 (46.0%)	4265 (46.8%)	4255 (45.1%)
Family history of Breast and/or ovarian cancer	2678 (14.0%)	1004 (10.9%)	1674 (17.6%)
Preoperative MRI assessment	12507 (67.0%)	5985 (65.2%)	6522 (68.6%)
ILC	583 (3.1%)	232 (2.5%)	351(3.7%)
ER＋	16458 (88.1%)	7856 (85.6%)	8602 (90.4%)
PgR+	14509 (77.6%)	6791 (74.0%)	7718 (81.1%)
HER2 positive	1601 (8.6%)	811 (8.8%)	790 (8.3%)
HG/NG 3	2441 (14.1%)	1312 (15.7%)	1129 (12.6%)
pT2	2791 (15.0%)	1434 (15.7%)	1357 (14.3%)
pN0	14766 (83.7%)	7222 (82.8%)	7544 (84.6%)
Ly	3776 (20.2%)	2052 (22.4%)	1724 (18.1%)

Table 3:Transition of positive margins and re-resection rates

	Pre SSO/ASTRO GL 2008-14	Pre Jp GL 2015-18	Post Jp GL 2019-22	P Value
Surgical margin				
Negative	5502 (60.0%)	3286 (66.1%)	3006 (66.2%)	<0.001
Close	2537 (27.7%)	1107 (22.3%)	1127 (24.8%)	
Positive	1029 (11.2%)	502 (10.1%)	361 (7.9%)	
Re-excision	701 (7.6%)	330 (6.6%)	224 (4.9%)	<0.001
conversion to mastectomy	408 (4.4%)	186 (3.7%)	121 (2.7%)	
additional resection	293 (3.2%)	144 (2.9%)	103 (2.3%)	
		RR: 0.8691	RR: 0.7428	

Re-excision rate had decreased by 13% after 2014 and by 26% after 2018

Table 4: Predictors of positive margins (exposure) and re-excision (multivariate analysis)

	Reference category		SM positive				Re-operation			
			OR	95%CI		P-value	OR	95%CI		P-value
Age	Ref:>70									
	<40		2.021	1.629	2.506	<.001	5.057	3.771	6.782	<.001
	40s		1.739	1.466	2.063	<.001	3.849	2.972	4.984	<.001
	50s		1.125	0.940	1.348	0.200	2.224	1.698	2.912	<.001
	60s		1.030	0.853	1.243	0.760	1.752	1.321	2.323	<.001
ER or PgR positive	ER/PgR negative		1.479	1.786	1.225	<.001	1.255	1.563	1.007	0.043
HER2 positive	HER2 negative		1.409	1.669	1.189	<.001	0.924	0.758	1.126	0.433
ILC	Other		2.764	2.241	3.408	<.001	3.356	2.643	4.262	<.001
Ly positive	negative		0.92	0.803	1.055	0.232	1.033	0.88	1.212	0.695
pT			1.189	1.079	1.31	<.001	1.085	0.973	1.209	0.141
pN			1.317	1.182	1.468	<.001	1.438	1.271	1.628	<.001
Years of operation	2008-2014	2019-22	1.488	1.305	1.696	<.001	1.549	1.32	1.818	<.001
	2015-2018		1.297	1.119	1.503	<.001	1.333	1.113	1.596	0.002

Discussion

- This study is the first to show a significant but **gradual decrease in re-excision rates in Japan** after BCS following the publication of international (2014) and domestic (2018) guideline.
- A meta-analysis of 30 studies with 599,016 participants reported an odds ratio of 0.62 for reduced re-excision rates after guideline implementation[1].
- **The re-excision rate in Japanese facilities was 7.6% before 2014**, significantly lower than the 22.4–55.6% reported in the International study[3] and 3 comprehensive US cancer center[3].
- This may be due to comprehensive margins assessment method using preoperative MRI and Cancer mapping to estimate residual cancer volume pathologically.
- The low MRI implementation rate (67%, Table 2) in this retrospective cohort study was due to missing data from two facilities; the other 5 facilities had a high rate of 92%. Internationally, MRI utilization before lumpectomy remains lower at 40–55%[4].
- Limitations include a 56% survey response rate, retrospective study focus on only seven institutions, combined analysis of IDC and DCIS, and lack of cosmetic outcomes data.
- We developed a new IBTR risk estimation model using the same dataset, conducted internal validation, and made a web-based risk estimation tool available[5].

Conclusion

The adoption of margin guidelines after BCS into clinical practice has been relatively modest in Japan compared to other countries. This may be due to consistently low re-excision rates, which are likely supported by widespread use of preoperative MRI (97%) and Cancer Mapping (78%).
Further individualization of local treatment requires appropriate risk stratification after BCS.

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web-based IBTR risk estimation tool→