

Impact of Margin Shaving on Re-Excision rates in patients with primary invasive carcinoma and carcinoma in situ in Breast Conserving Surgery. Data from a population based cohort of clinical cancer registry

Fernandez-Pacheco, M¹, Ortman, O¹, Gerken, M², Ignatov, A¹, Klinkhammer-Schalke, M², Inwald, EC¹

¹ University Medical Center Regensburg, Department of Gynaecology and Obstetrics, Regensburg, Germany

² Tumor Center Institute for Quality Management and Health Services Research, University of Regensburg, Regensburg, Germany.

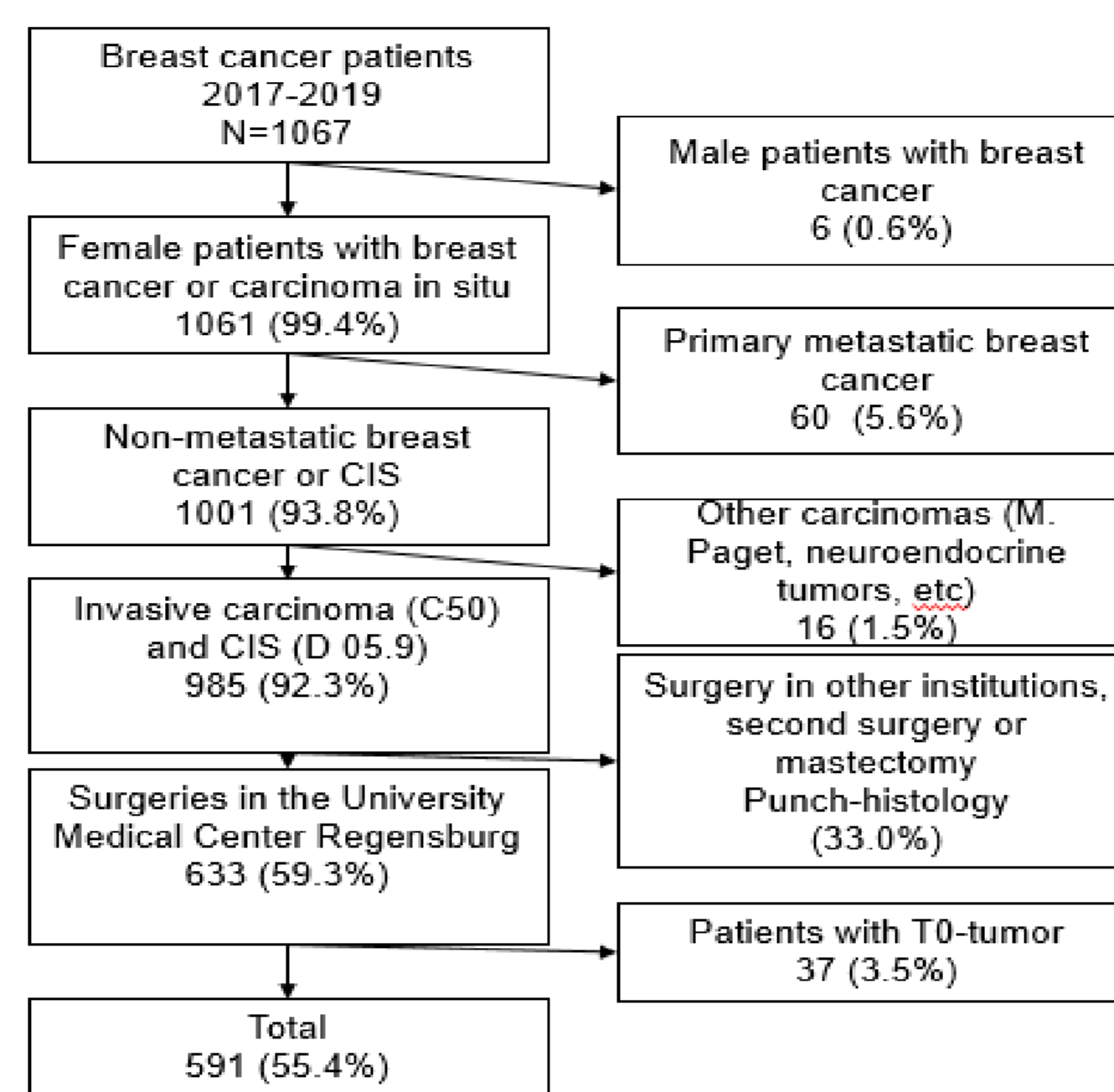
Background

Previous studies reported considerably high re-excision rates in breast-conserving surgery (BCS) in patients with primary invasive breast cancer or carcinoma in situ, about 20%. Circumferential Marging Shaving (CMS) could be a surgical strategy to reduce re-excision rates. This study aimed to investigate the effects of CMS during BCS on reducing residual tumor.

Different demographic, clinical and tumor-based variables but also surgeon- and institution based variables were included in the analysis to determine their dependence on re-excision rates.

This study aims to identify possible risk factors in order to reduce the re-excision rates. Also, this study endeavors to determine by comparing two surgical strategies whether it is possible or not to reduce re-excision rates by changing the surgeon's approach.

Patients and Methods



Study design: The current retrospective cohort study analyzed clinical cancer registry data from 591 patients with non-metastatic, invasive breast cancer or carcinoma in situ. Women residing in the Upper Palatinate and Lower Bavaria who were diagnosed from January 2017 to September 2019 were included.

Data basis: Clinical, histopathological and surgical information from the database (TUDOK) of the Tumor Center and from the database of the Department of Gynecology and Obstetrics of the University Medical Center in Regensburg was used.

Inclusion criteria: Patients with invasive breast cancer (NST), lobular type or carcinoma in situ receiving BCS in the University Medical Center in Regensburg by different surgeons, without simultaneous or previous secondary tumors were included (Fig. 1).

Statistical methods and analysis: Binary Logistic Regression and Stepwise-Back-Selection of variables in the equation.

Fig. 1: Inclusion and exclusion criteria

Results

Tab. 1: Patient characteristics of the patients in the total cohort with breast-conserving surgery according to strategy of surgery (N = 591)

	N	Marging Shaving		Intraop Res./ no Res.		Total N	Total %	p
		N	%	N	%			
Age at diagnosis								
<50	9	9	11.3%	93	18.2%	102	17.3%	
50-59	19	19	23.8%	153	29.9%	172	29.1%	138
60-69	32	32	40.0%	151	29.5%	183	31.0%	
>70	20	20	25.0%	114	22.3%	134	22.7%	
Menopausal status								
Premenop.	8	8	13.8%	59	15.0%	67	14.9%	
Postmenop.	41	41	70.7%	281	71.5%	324	71.4%	962
Ns	9	9	15.5%	53	13.5%	62	13.7%	
Histologic type								
Inv. ductal Ca	60	60	75.0%	357	69.9%	417	70.6%	
Inv. lobul. Ca	9	9	11.3%	60	11.7%	69	11.7%	096
Other Ca	4	4	5.0%	9	1.8%	13	2.2%	
Carcin. in situ	7	7	8.8%	85	16.6%	92	15.6%	
Side								
Left	39	39	48.8%	262	51.3%	301	50.9%	675
Right	41	41	51.2%	249	48.7%	290	49.1%	
T pathologic								
T1	33	33	41.3%	195	38.2%	228	38.6%	
T2-4	24	24	30.0%	165	32.3%	189	32.0%	390
Tis	7	7	8.8%	74	14.5%	81	13.7%	
Tx/tx	16	16	20.0%	77	15.1%	93	15.7%	
N pathologic								
N0	43	43	53.8%	330	64.6%	373	63.1%	
N1-3	15	15	18.8%	100	19.6%	115	19.5%	035
Nx/tx	22	22	27.5%	81	15.9%	103	17.4%	
Grading								
G1	15	15	18.8%	111	21.7%	126	21.3%	
G2	43	43	53.8%	238	46.6%	281	47.5%	599
G3	10	10	12.5%	61	11.9%	71	12.0%	
GX/NA	12	12	15.0%	101	19.8%	113	19.1%	
Lymphvessel invasion								
L0	51	51	63.7%	343	67.1%	394	66.7%	
L1	14	14	17.5%	81	15.9%	95	16.1%	838
Lx/tx	15	15	18.8%	87	17.0%	102	17.3%	
Vascular invasion								
V0	64	64	80.0%	408	79.8%	472	79.9%	
V1/2	1	1	1.3%	14	2.7%	15	2.5%	714
Vx/tx	15	15	18.8%	89	17.4%	104	17.6%	
Hormonal receptor status								
Positive	73	73	91.3%	461	90.2%	534	90.4%	
Negative	6	6	7.5%	37	7.2%	43	7.3%	777
Ns	1	1	1.3%	13	2.5%	14	2.4%	
Her-2								
Positive	6	6	7.5%	50	9.8%	56	9.5%	
Negative	66	66	82.5%	391	76.5%	457	77.3%	492
Ns	8	8	10.0%	70	13.7%	78	13.2%	
Ki67								
Low risk <=15	48	48	60.0%	328	64.2%	376	63.6%	
High risk >15	23	23	28.7%	133	26.0%	156	26.4%	766
Ns	9	9	11.3%	50	9.8%	59	10.0%	
associated dcis								
Yes	12	12	15.0%	66	12.9%	78	13.2%	609
No	68	68	85.0%	445	87.1%	513	86.8%	
associated lobular intraneoplasia								
Yes	0	0	0.0%	2	0.4%	2	0.3%	575
No	80	80	100.0%	509	99.6%	589	99.7%	
Neoadjuvant CHT								
Yes	6	6	7.5%	46	9.0%	52	8.8%	575
No	74	74	92.5%	465	91.0%	539	91.2%	
Preoperative wire-marking								
ja	67	67	83.8%	414	81.0%	481	81.4%	561
nein	13	13	16.3%	97	19.0%	110	18.6%	
Intraoperative mammography								
Yes	21	21	26.3%	164	32.2%	185	31.4%	559
No	59	59	73.8%	346	67.8%	405	68.6%	
Intraoperative sonography								
Yes	56	56	70.0%	317	62.0%	373	63.1%	
No	24	24	30.0%	194	38.0%	218	36.9%	170
Surgeon								
Surgeon 1	49	49	61.3%	88	17.2%	137	23.2%	
Surgeon 2	9	9	11.3%	58	11.4%	67	11.3%	000
Surgeon 3	0	0	0.0%	52	10.2%	52	8.8%	
Surgeon 4	6	6	7.5%	110	21.5%	116	19.6%	
Surgeon 5	5	5	6.3%	84	16.4%	89	15.1%	
Others	11	11	13.8%	119	23.3%	130	22.0%	
Residual tumor								
R0	59	59	73.8%	373	73.0%	432	73.1%	
R1	21	21	26.3%	138	27.0%	159	26.9%	887
Total	80	80	100.0%	511	100.0%	591	100.0%	

Tab 2 Odds ratios (OR) for risk of R1 after Margin Shaving versus intraoperative resection/none in patients with BCS with invasive breast cancer or carcinoma in situ. Binary Logistic regression analyses in total cohort and subgroups. As shown in this analysis, patients with small tumors (T1) significantly benefit from Marging Shaving in comparison to the conventional technique.

Category	Group	Univariable Cox-regression				Multivariable* Cox-regression			
		p	OR*	Lower 95%-CI	Upper 95%-CI	p	OR*	Lower 95%-CI	Upper 95%-CI
Total		.887	.962	.563	1.643	.738	1.104	.620	1.965
Histological type	Inv. ductal Ca	.722	.890	.467	1.694	.723	.881	.438	1.772
	Inv. lobular Ca	.857	.857	.160	4.583	.391	3.041	.239	38.723
	Carcin. in situ	.737	1.306	.274	6.222	.573	1.924	.198	18.751
Invasive ductal carcinoma	T1	.065	.247	.056	1.090	.057	.214	.044	1.050
	T2-4	.100	2.244	.857	5.874	.172	2.580	.662	10.053
Invasive ductal carcinoma	N0	.861	1.079	.459	2.538	.832	.902	.348	2.338
	N1-3	.270	.407	.083	2.009	.120	.114	.007	1.758
Invasive ductal carcinoma	G1	.122	.193	.024	1.552	.120	.149	.014	1.637
	G2	.936	.965	.407	2.292	.826	.898	.344	2.347
	G3	.477	1.757	.371	8.317	.663	1.890	.108	32.994

Residual tumor	R0	59	73.8%	373	73.0%	432	73.1%
	R1	21	26.3%	138	27.0%	159	26.9%
	Total	80	100.0%	511	100.0%	591	100.0%

Tab 3 Rates of residual tumor in patients who received Marging Shaving versus those who received an intraoperative resection/none with BCS with invasive breast cancer or carcinoma in situ. Rates of residual tumor seem to be equal in both groups.

Discussion and Conclusion

Our study suggests that only certain patients who underwent breast conserving surgery benefit from CMS compared to the standard technique of doing re-excision depending on intraoperative sonography/mammography. Patients with smaller tumors (pathologic T1) showed to have a significant benefit from CMS. In all other subgroups using one surgical technique or another did not offer any significant advantage. Regarding the risk of residual tumor after BCS, older patients (specially >70 years) appear to have less residual tumor than younger ones, maybe due to more extensive excisions. Also, ductal carcinoma in situ showed to have a higher risk of residual tumor as previously described in literature.

Contact