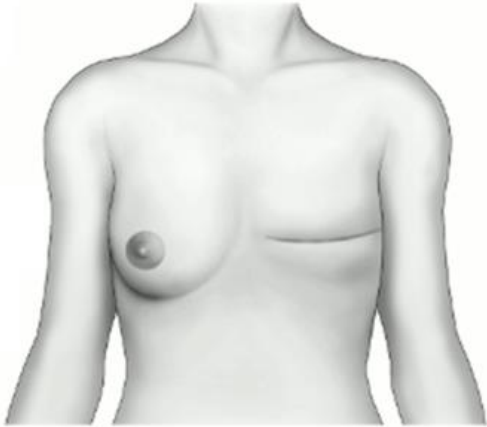


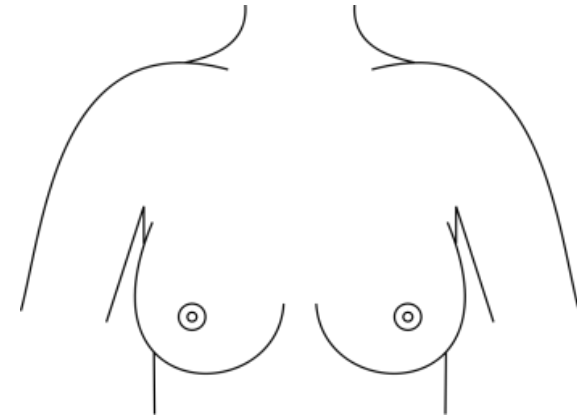
Salvage mastectomy versus 2nd conservative treatment for Second Ipsilateral Breast Tumor Event

Jean-Michel Hannoun-Levi MD, PhD, MS,
Department of Radiation Oncology, Antoine Lacassagne Cancer Center, Nice - FRANCE

Isolated 2nd IBTE



Salvage Mastectomy
(SM)



2nd conservative treatment
(2ndCT)

Development

- SM or 2ndCT: data from the literature
- Indications of 2ndCT
- Different techniques of re-irradiation of the tumor bed
- Conclusion

Lumpectomy

Authors	^c pts	MFU (months)	2nd LR (%)	10-year DMFS (%)	5-year DFS (%)	5-year OS (%)
Kurtz et al. ⁷	66	84	12	NA	NA	NA
Fowble et al. ⁸	52	25	NA	NA	59	84
Osborne et al. ⁹	46	28	15	NA	55	76
Cajucoum et al. ¹⁰	25	52	32	NA	51	65
Abner et al. ¹¹	123	39	6	NA	41	NA
Voogd et al. ¹²	266	60	25	47	NA	61
Salvadori et al. ¹³	134	NA	4	55 ^a	NA	70
Doyle et al. ¹⁴	112	44	3	47	NA	69 ^b
Huang et al. ¹⁵	126	NA -	12	45	NA	58 ^b
Alpert et al. ¹⁶	116	244	7	32	NA	66 ^b

Authors	^c pts	MFU (months)	2nd LR (%)	10-year DMFS (%)	10-year CSS (%)	10-year OS (%)
Kurtz et al. ²¹	50	51	32	NA	64	42
Abner et al. ¹¹	16	39	31	NA	NA	NA
Dalberg et al. ²²	17	NA	12.5	NA	NA	NA
Salvadori et al. ¹³	57	NA	19	80 ^a	NA	85 ^b
Alpert et al. ¹⁶	30	244	7	24	61	58
Ishitobi et al. ²³	78	40	21	NA	NA	NA

Lumpectomy + APBri

Authors	^d pts	MFU (months)	IT	Dose Gy)	2nd LR (%)	5-year DFS (%)	5-year OS (%)	G3-4 Tox (%)	Exc/Good CR (%)
Maulard et al. ²⁵	15	48	ILB	30	26	31	61	8	53
	23	36	ILB ^a	60-70	17	41	50	-	-
Deutsch et al. ³²	39	63	e- TB	50	21	68	78	NA	69
	24	50	ILB	30	25	69	92	10	NA
Hannoun-Levi et al. ²⁶	45	50	ILB	46	11	-	-	-	-
Kraus- Tiefenbacher et al. ³³	15	26	IORT	14.7-20	0	NA	NA	0	82
Chadha et al. ²⁷	15	36	ILB	30-45	7	NA	100 ^b	0	100
Trombetta et al. ²⁸	21	40	ILB	45-50	5	NA	NA	10	92
Guix et al. ³⁰	36	89	IHB	30	3	64 ^c	97 ^c	0	NA
Hannoun-Levi et al. ³¹	42	21	IHB	34	2	NA	NA	3	97
Kauer- Dorner et al. ²⁹	39	57	IPB	56	7	77	87	7	76
GEC-ESTRO ³⁴	217	47	ILB/IPB/IHB	46/50/32	4	85	89	11	85

Authors	^c pts	MFU (months)	2nd LR (%)	10-year DMFS (%)	5-year DFS (%)	5-year OS (%)
Kurtz et al. ⁷	66	84	12	NA	NA	NA
Fowble et al. ⁸	52	25	NA	NA	59	84
Osborne et al. ⁹	46	28	15	NA	55	76
Cajucoum et al. ¹⁰	25	52	32	NA	51	65
Abner et al. ¹¹	123	39	6	NA	41	NA
Voogd et al. ¹²	266	60	25	47	NA	61
Salvadori et al. ¹³	134	NA	4	55 ^a	NA	70
Doyle et al. ¹⁴	112	44	3	47	NA	69 ^b
Huang et al. ¹⁵	126	NA -	12	45	NA	58 ^b
Alpert et al. ¹⁶	116	244	7	32	NA	66 ^b

10%

Lumpectomy

Authors	^c pts	MFU (months)	2nd LR (%)	10-year DMFS (%)	10-year CSS (%)	10-year OS (%)
Kurtz et al. ²¹	50	51	32	NA	64	42
Abner et al. ¹¹	16	39	31	NA	NA	NA
Dalberg et al. ²²	17	NA	12.5	NA	NA	NA
Salvadori et al. ¹³	57	NA	19	80 ^a	NA	85 ^b
Alpert et al. ¹⁶	30	244	7	24	61	58
Ishitobi et al. ²³	78	40	21	NA	NA	NA

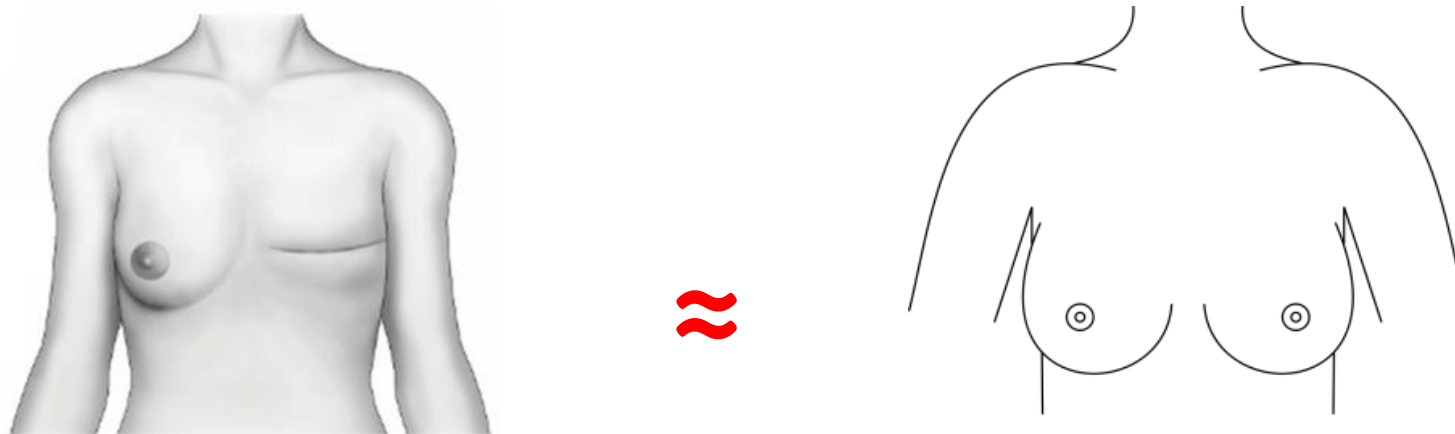
20%

Lumpectomy + APBri

Authors	^d pts	MFU (months)	IT	Dose Gy)	2nd LR (%)	5-year DFS (%)	5-year OS (%)	G3-4 Tox (%)	Exc/Good CR (%)
Maulard et al. ²⁵	15	48	ILB	30	26	31	61	8	53
	23	36	ILB ^a	60-70	17	41	50	-	-
Deutsch et al. ³²	39	63	e- TB	50	21	68	78	NA	69
	24	50	ILB	30	25	69	92	10	NA
Hannoun-Levi et al. ²⁶	45	50	ILB	46	11	-	-	-	-
Kraus- Tiefenbacher et al. ³³	15	26	IORT	14-20	0	NA	NA	0	82
Chadha et al. ²⁷	15	36	ILB	30-45	7	NA	100 ^b	0	100
Trombetta et al. ²⁸	21	40	ILB	45-50	5	NA	NA	10	92
Guix et al. ³⁰	36	89	IHB	30	3	64 ^c	97 ^c	0	NA
Hannoun-Levi et al. ³¹	42	21	IHB	34	2	NA	NA	3	97
Kauer- Dorner et al. ²⁹	39	57	IPB	56	7	77	87	7	76
GEC-ESTRO ³⁴	217	47	ILB/IPB/IHB	46/50/32	4	85	89	11	85

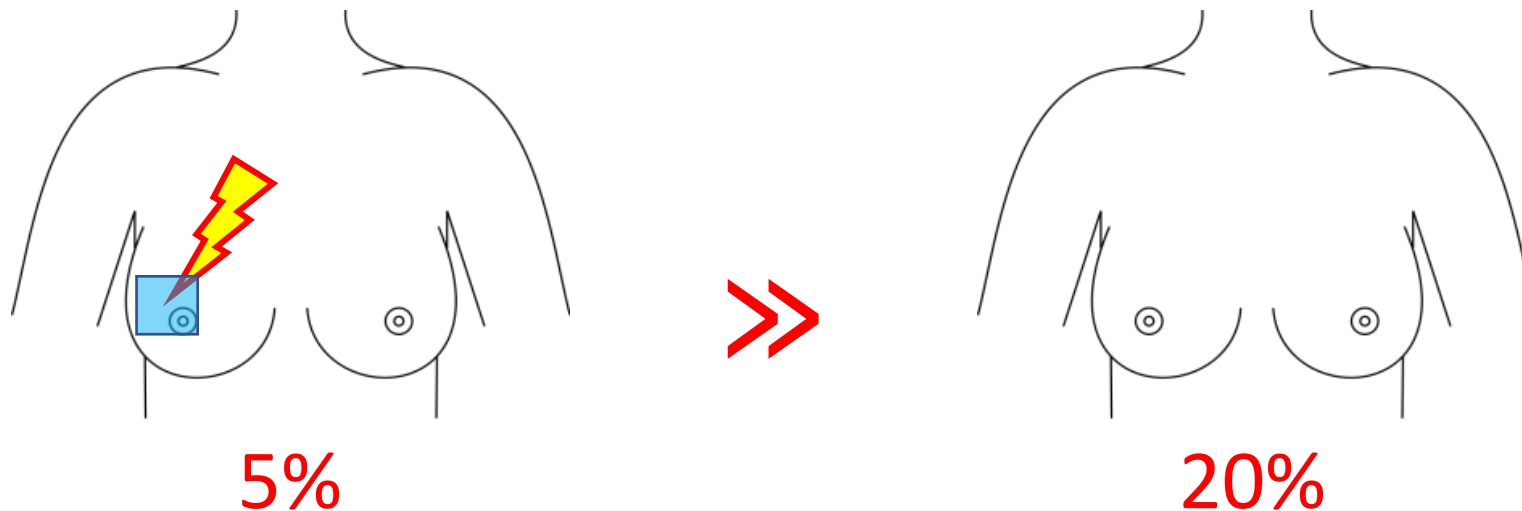
10%

Free 3rd IBTE survival



- ✓ Kolben T et al. Int J Surg. 2015;23(Pt A):141-6.
- ✓ Lee JH et al. J Breast Cancer. 2015;18:386-93.
- ✓ Yoshida A et al. Eur J Surg Oncol. 2016;42:474-80.
- ✓ Houvenaeghel G et al. Eur J Surg Oncol. 2017;43:1409-14.
- ✓ Smanyakó V, et al. Brachytherapy. 2019;18:411-19.
- ✓ Van den Bruele AB et al. Breast Cancer Res Treat. 2021;187:105-112

Free 3rd IBTE survival



- ✓ Gentilini O et al. Ann Surg Oncol. 2012;19(12):3771-6.
- ✓ Ishitobi M et al. Breast Cancer. 2014;21(6):754-60.
- ✓ Vila J et al. J Surg Oncol. 2014;110(1):62-7.
- ✓ Walstra CJEF et al. Eur J Surg Oncol. 2019;45(8):1317-27.
- ✓ Su Y, et al. Oncologist 2019; 24(9): e818-e27

Free 3rd IBTE survival

European Journal of Surgical Oncology 45 (2019) 1317–1327

Contents lists available at [ScienceDirect](#)

European Journal of Surgical Oncology

journal homepage: www.ejso.com

Repeat breast-conserving therapy for ipsilateral breast cancer recurrence: A systematic review

Coco J.E.F. Walstra^{a,*}, Robert-Jan Schipper^a, Ingrid G.M. Poodt^a, Yvonne E. van Riet^a,
Adri C. Voogd^{b,c,d}, Maurice J.C. van der Sangen^e, Grard A.P. Nieuwenhuijzen^a

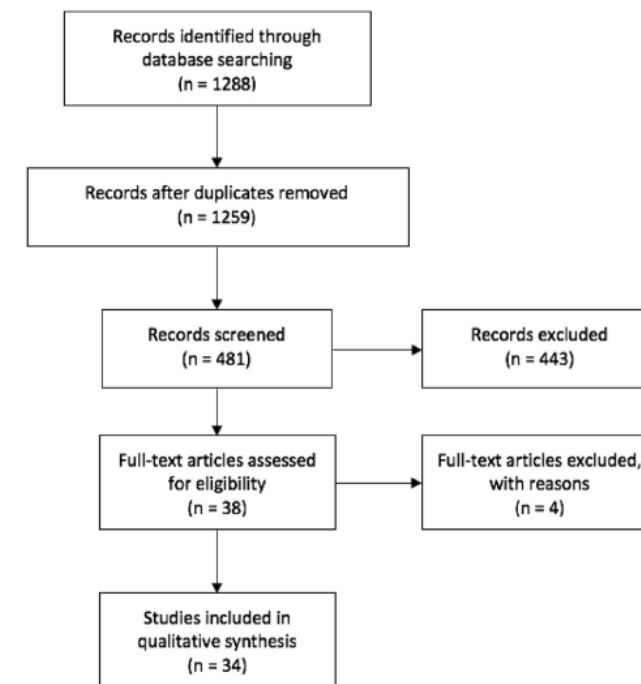


Identification

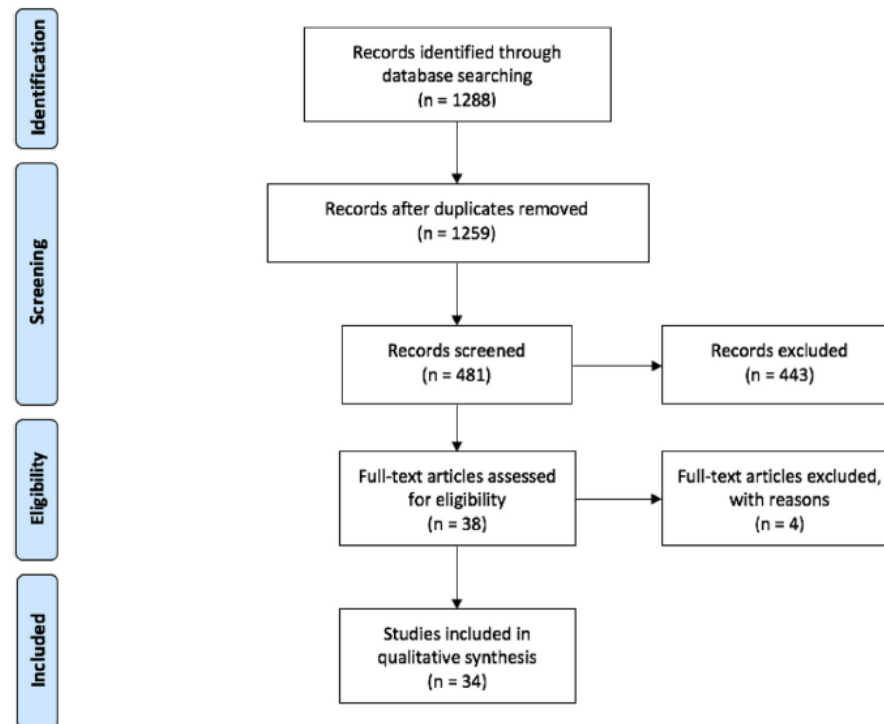
Screening

Eligibility

Included

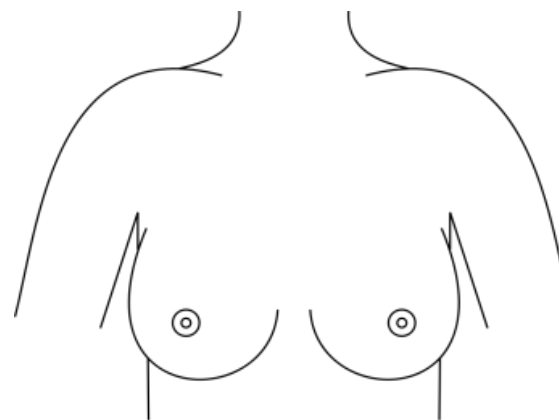
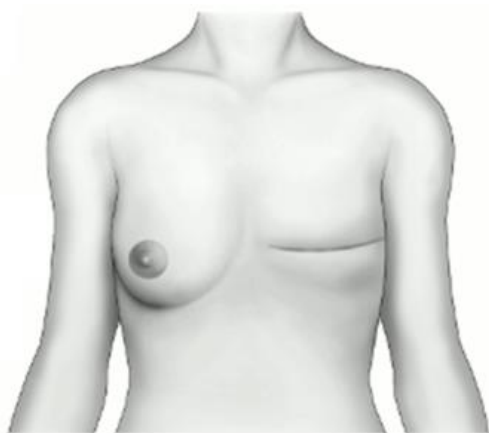


Free 3rd IBTE survival



« Repeat BCS followed by re-irradiation, with either whole breast or partial breast re-irradiation, seems a feasible alternative to mastectomy in case of IBTR, in selected patients. Toxicity rates are low and the cosmetic outcome is good, but the size and follow-up of the published patient series is limited. »

SM or 2ndCT: data from the literature



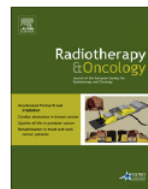


ELSEVIER

Contents lists available at SciVerse ScienceDirect

Radiotherapy and Oncology

journal homepage: www.thegreenjournal.com



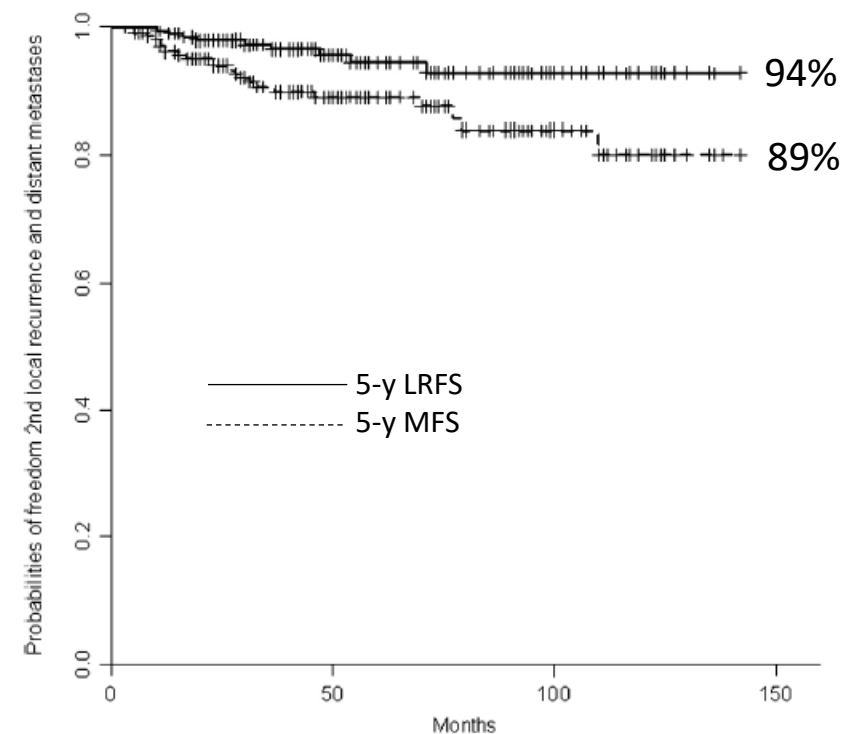
Accelerated partial breast irradiation

Accelerated partial breast irradiation with interstitial brachytherapy as second conservative treatment for ipsilateral breast tumour recurrence: Multicentric study of the GEC-ESTRO Breast Cancer Working Group



Jean-Michel Hannoun-Levi^{a,*}, Alexandra Resch^b, Jocelyn Gal^c, Daniela Kauer-Dorner^b, Vratislav Strnad^d, Peter Niehoff^e, Kristina Loessel^f, Gyoergy Kovács^g, Erick Van Limbergen^h, Csaba Polgárⁱ,
On behalf of the GEC-ESTRO Breast Cancer Working Group

- Multicenter international retrospective study
- 2000 to 2010
- 217 pts
- MFU: 47 months
- Low & HDR mutlicatheter interstitial brachytherapy



	Time	0	12	24	36	48	60	120
2 nd LR	# pts @ risk	217	200	165	129	97	69	11
	# events	0	1	3	2	1	1	1
Dist. met.	# pts @ risk	217	195	159	122	93	70	12
	# events	0	8	4	5	2	0	4

Research

JAMA Oncology | **Original Investigation** JAMA Oncology Published online November 21, 2019

Effectiveness of Breast-Conserving Surgery and 3-Dimensional Conformal Partial Breast Reirradiation for Recurrence of Breast Cancer in the Ipsilateral Breast

The NRG Oncology/RTOG 1014 Phase 2 Clinical Trial

Douglas W. Arthur, MD; Kathryn A. Winter, MS; Henry M. Kuerer, MD, PhD; Bruce Haffty, MD; Laurie Cuttino, MD; Dorin A. Todor, PhD; Pramila Rani Anne, MD; Penny Anderson, MD; Wendy A. Woodward, MD; Beryl McCormick, MD; Sally Cheston, MD; Walter M. Sahjidak, MD; Daniel Canaday, MD; Doris R. Brown, MD, PhD; Adam Currey, MD; Christine M. Fisher, MD, MPH; Reshma Jagsi, MD, DPhil; Jennifer Moughan, MS; Julia R. White, MD

- Multicenter international prospective study
- 2010 to 2013
- 58 pts
- MFU: 66 months
- 3DCRT 45 Gy, 15 f (BID)

End Points	No. of Events	3 y	No. at Risk	5 y	No. at Risk
		Estimate, % (95% CI)		Estimate, % (95% CI)	
IBR ^a	4	3.4 (0.6-10.7)	52	5.2 (1.4-13.2)	46
MF ^b	7	5.2 (1.3-13.1)	51	10.5 (4.2-20.1)	43
DMFS	3	94.8 (84.8-98.3)	53	94.8 (84.8-98.3)	48
OS	3	94.8 (84.8-98.3)	53	94.8 (84.8-98.3)	48



Treatment of second ipsilateral breast tumor event: A need for a new type of evidence for avoiding mastectomy



M. Trombetta*
Allegheny General Hospital, Pittsburgh, PA 15212, USA

J.-M. Hannoun-Levi
Antoine Lacassagne Cancer Center, Nice, France



Phase III randomized trial

- ✓ Methodological point of view
 - End point, design, number of patient,
- ✓ Ethical point of view
- ✓ Time & money



Trombetta M, Hannoun-Levi JM. Eur J Surg Oncol. 2017;43(4):849-850.

Clinical Investigation

Salvage Mastectomy Versus Second Conservative Treatment for Second Ipsilateral Breast Tumor Event: A Propensity Score-Matched Cohort Analysis of the GEC-ESTRO Breast Cancer Working Group Database



Jean-Michel Hannoun-Levi, MD, PhD,* Jocelyn Gal, PhD,[†]
Erik Van Limbergen, MD, PhD,[‡] Marie-Eve Chand, MD,*
Renaud Schiappa, MSc,[†] Viktor Smanyko, MD,[§]
Daniela Kauer-Domer, MD,^{||}
David Pasquier, MD, PhD,[¶] Claire Lemanski, MD,[#]
Séverine Racadot, MD,** Gilles Houvenaeghel, MD,^{††}
Benjamin Guix, MD, PhD,^{‡‡} Aurélie Belliere-Calandry, MD,^{§§}
Kristina Loessl, MD,^{|||} Bulent Polat, MD, PhD,^{¶¶}
Cristina Gutierrez, MD, PhD,^{##} Razvan Galalae, MD, PhD,^{***}
Csaba Polgar, MD, PhD,^{§,†††} and Vratislav Strnad, MD, PhD^{‡‡‡}

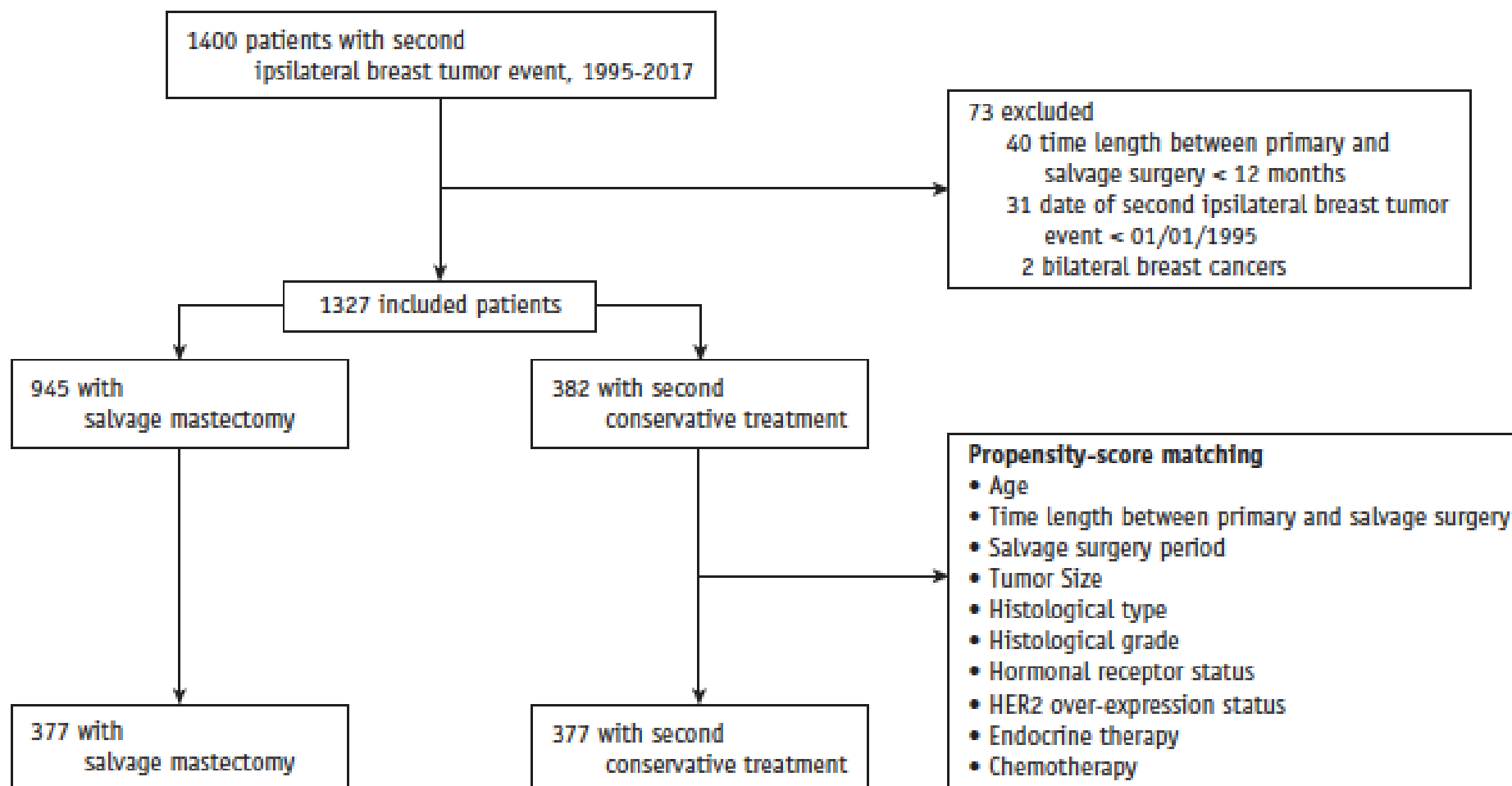


Table 1 Baseline characteristics for patients who underwent salvage mastectomy versus those who received second conservative treatment before and after propensity matching

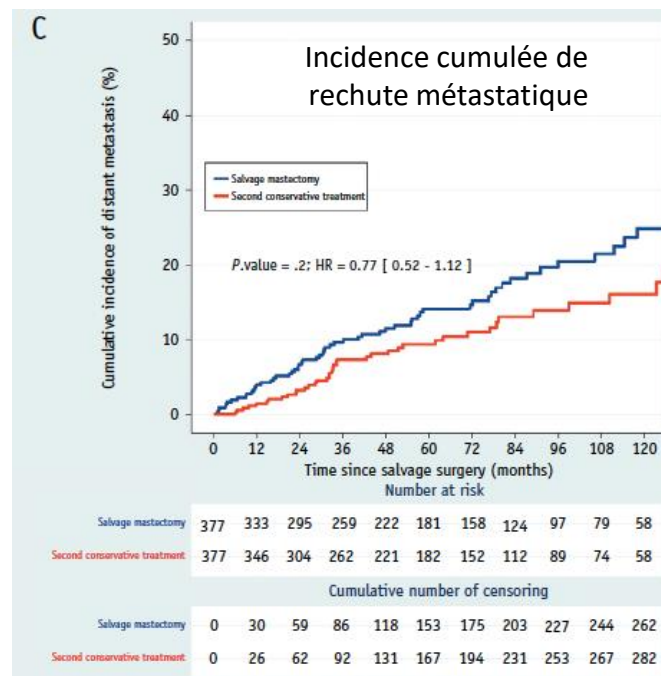
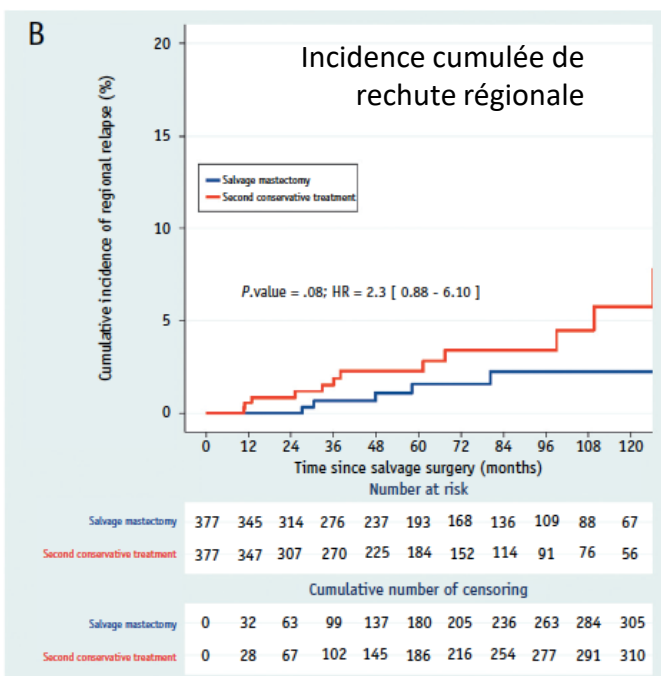
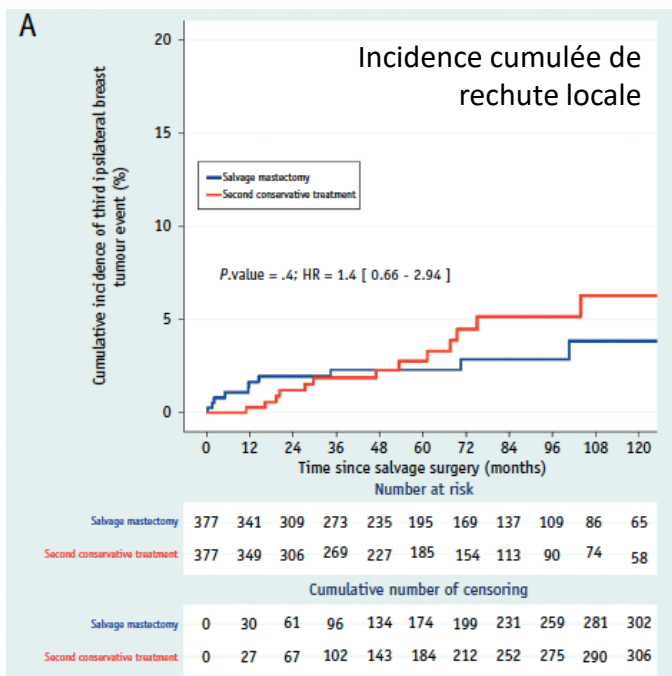
	Unmatched (complete) data set			Matched (1:1) data set		
	Salvage mastectomy (N = 945)	Second conservative treatment (N = 382)	P value	Salvage mastectomy (N = 377)	Second conservative treatment (N = 377)	P value
Age (minimum-maximum), y	60 (27.8-89.3)	64 (27.5-90.3)	<.001*	62.7 (31.1-89.3)	62.4 (27.5-90.3)	.74*
Time between primary and salvage surgery (range), y	8.34 (1-35.3)	10.56 (1.1-35.3)	<.001*	10.1 (1.1-35.3)	10.3 (1.1-35.3)	.61*
Salvage surgery period			.004†			.95†
On or before December 31, 2001	133 (14.1%)	29 (7.6%)		30 (8.0%)	29 (7.7%)	
January 1, 2002-December 31, 2009	413 (43.7%)	185 (48.4%)		187 (49.6%)	184 (48.8%)	
On or after January 1, 2010	399 (42.2%)	168 (44.0%)		160 (42.4%)	164 (43.5%)	
Median follow-up, mo	78 (71.9-83.9)	73.2 (67.5-78.8)	.03‡	75.4 (65.4-83.3)	73.8 (67.5-80.8)	.9‡
Tumor size			<.001†			.88†
Strictly inferior <30 mm	750 (79.4)	355 (92.9)		349 (92.6)	350 (92.8)	
Inferior or equal ≥30 mm	195 (20.6)	27 (7.1)		28 (7.4)	27 (7.2)	
Histologic type			.051†			.673†
Invasive ductal (no special type)	772 (81.7)	334 (87.4)		327 (86.7)	323 (85.7)	
Invasive lobular and others	173 (18.3)	48 (12.6)		50 (13.3)	54 (14.3)	
Histologic grade			<.001†			.9†
1	80 (8.5)	72 (18.8)		62 (16.4)	66 (17.5)	
2	489 (51.7)	187 (49.0)		188 (49.9)	183 (48.5)	
3	376 (39.8)	123 (32.2)		127 (33.7)	128 (34.0)	
Hormonal receptor status			.078†			.66†
Positive	696 (73.7)	299 (78.3)		287 (76.1)	292 (77.5)	
Negative	249 (26.3)	83 (21.7)		90 (23.9)	85 (22.5)	
Her2 status			.684†			.44†
Nonoverexpressed	793 (83.9)	324 (84.8)		307 (81.4)	315 (83.6)	
Overexpressed	152 (16.1)	58 (15.2)		70 (18.6)	62 (16.4)	
Hormone therapy			.02†			.48†
Yes	574 (60.7)	258 (67.5)		262 (69.5)	253 (67.1)	
No	371 (39.3)	124 (32.5)		115 (30.5)	124 (32.9)	
Chemotherapy			<.001†			.79†
Yes	329 (34.8)	84 (22.0)		87 (23.1)	84 (22.3)	
No	616 (65.2)	298 (78.0)		290 (76.9)	293 (77.7)	

* Wilcoxon's test.

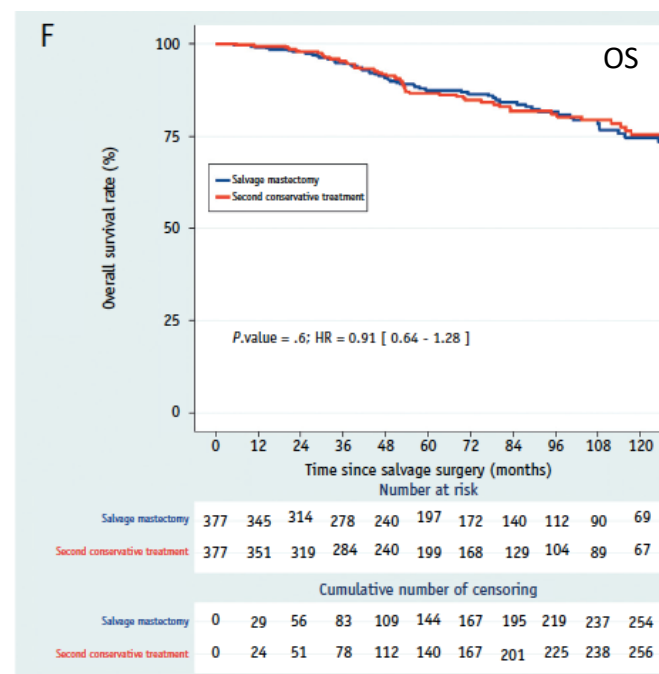
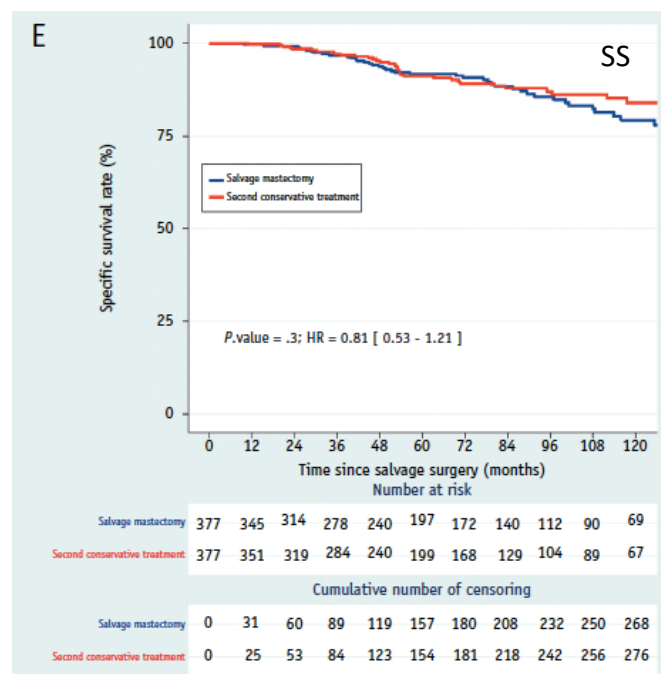
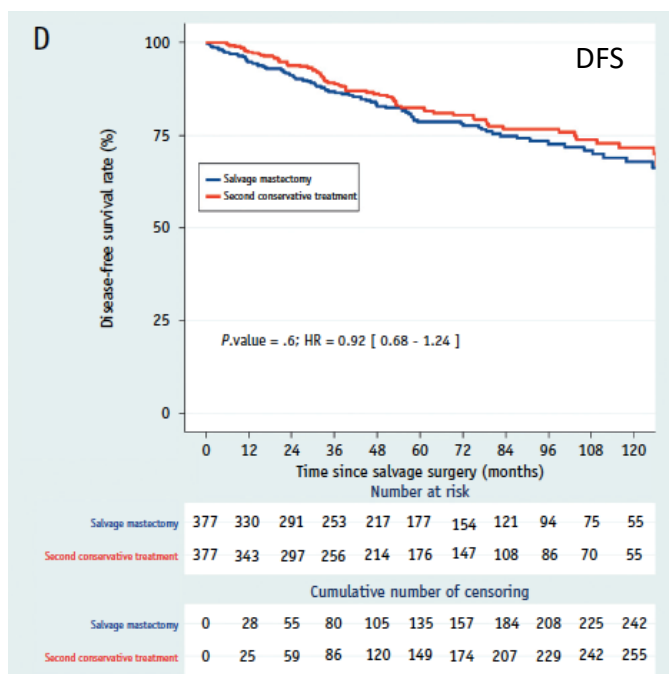
† χ^2 test.

‡ Log-rank's test.

5-year Oncological outcome

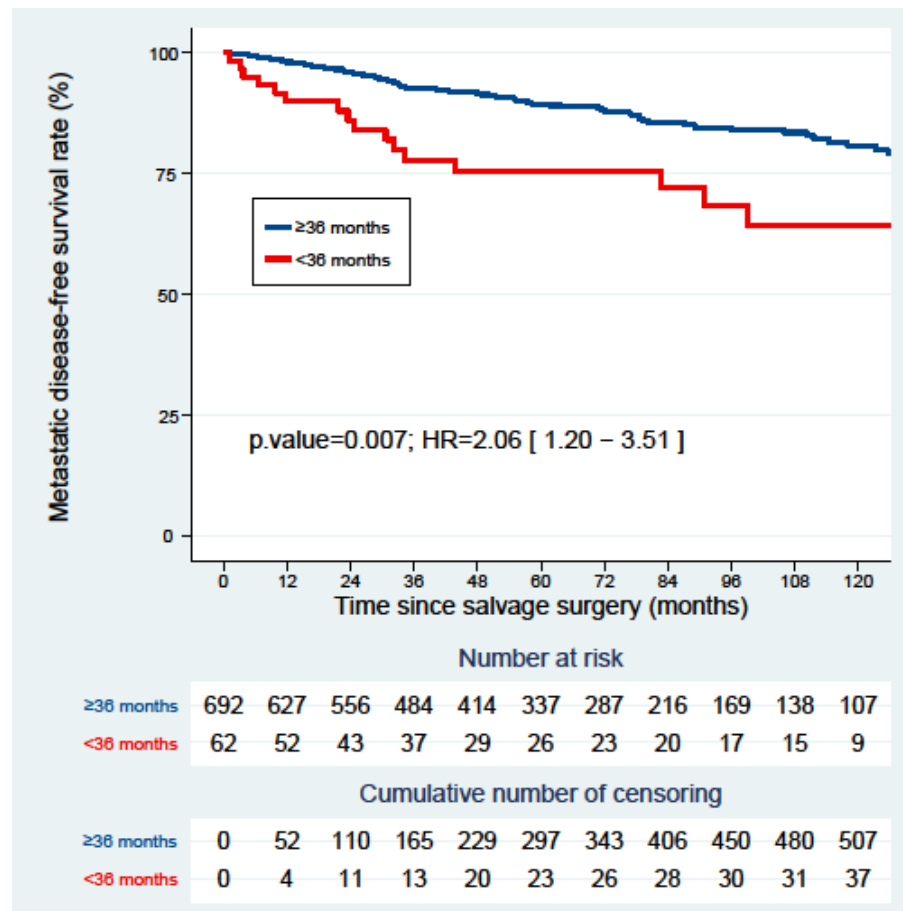


5-year Oncological outcome

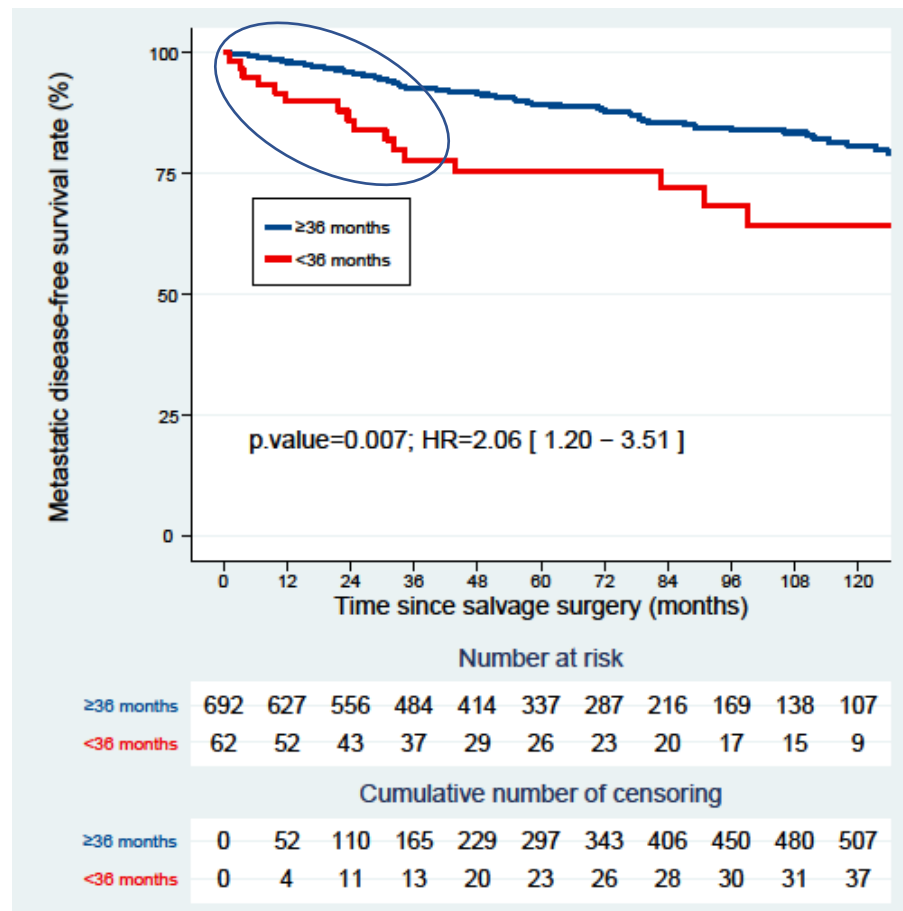






	Univariate analysis				Multivariate analysis			
Oncological outcomes	Data	Hazard ratio	Confidence interval 95%	p value	Data	Hazard ratio	Confidence interval 95%	p value
Cumulative incidence of third ipsilateral breast tumor event	Age (< 48 y)	4.08	(1.91 - 8.75)	< 0.001				
Cumulative incidence of regional relapse	Tumor size (≥ 30 mm)	3.60	(1.19 - 10.88)	0.023				
Cumulative incidence of distant metastasis	Age (< 48 y)	1.90	(1.21 - 2.99)	0.005				
	Time length between primary and salvage surgery (< 36 months)	2.06	(1.21 - 3.51)	0.008	Time length between primary and salvage surgery (< 36 months)	1.78	(1.02 - 3.08)	0.035
	Period of salvage surgery				Period of salvage surgery			
	≤ 31.12.2001	1	-	-	≤ 31.12.2001	1	-	-
	≥ 01.01. 2002 / ≤ 31.12.2009	0.61	(0.38 - 0.99)	0.049	≥ 01.01. 2002 / ≤ 31.12.2009	0.58	(0.34 - 0.94)	0.026
	≥ 01.01. 2010	0.34	(0.18 - 0.67)	0.001	≥ 01.01. 2010	0.35	(0.17 - 0.68)	0.001
	Tumor size (≥ 30 mm)	2.91	(1.75 - 4.85)	< 0.001	Tumor size (≥ 30 mm)	2.89	(1.70 - 4.87)	<0.001
	Histological grade							
	1	1	-	-				
2	2.31	(1.21 - 4.41)	0.010					
3	1.77	(0.90 - 3.49)	0.096					
Her2 status (+++)	1.75	(1.14 - 2.70)	0.011					
Chemotherapy (yes)	1.98	(1.32 - 2.95)	< 0.001					
Disease-free survival	Time length between primary and salvage surgery (< 36 months)	2.12	(1.38 - 3.28)	< 0.001	Time length between primary and salvage surgery (< 36 months)	1.92	(1.23 - 3.00)	0.003
	Period of salvage surgery				Period of salvage surgery			
	≤ 31.12.2001	1	-	-	≤ 31.12.2001	1	-	-
	≥ 01.01. 2002 / ≤ 31.12.2009	0.63	(0.42 - 0.95)	0.025	≥ 01.01. 2002 / ≤ 31.12.2009	0.61	(0.40 - 0.91)	0.014
	≥ 01.01. 2010	0.39	(0.24 - 0.67)	<0.001	≥ 01.01. 2010	0.42	(0.24 - 0.71)	0.001
	Tumor size (≥ 30 mm)	1.95	(1.22 - 3.13)	0.004	Tumor size (≥ 30 mm)	1.89	(1.16 - 3.06)	0.008
	Her2 status (+++)	1.70	(1.20 - 2.42)	0.002				
Chemotherapy (yes)	1.49	(1.07 - 2.09)	0.018					
Specific survival	Age (< 48 y)	1.85	(1.15 - 2.99)	0.011	Age (< 48 y)	1.78	(1.08 - 2.93)	0.019
	Time length between primary and salvage surgery (< 36 months)	2.01	(1.13 - 3.55)	0.016	Time length between primary and salvage surgery (< 36 months)	1.71	(0.94 - 3.10)	0.050
	Tumor size (≥ 30 mm)	2.21	(1.22 - 3.98)	0.008	Tumor size (≥ 30 mm)	2.09	(1.14 - 3.82)	0.014
	Histological grade				Histological grade			
	1	1	-	-	1	1	-	-
	2	2.09	(1.02 - 4.30)	0.043	2	2.22	(1.06 - 4.64)	0.029
	3	2.51	(1.21 - 5.18)	0.013	3	2.51	(1.20 - 5.29)	0.012
	Her2 status (+++)	1.66	(1.04 - 2.65)	0.031				
Chemotherapy (yes)	2.06	(1.34 - 3.16)	0.001					
Overall survival	Time length between primary and salvage surgery (< 36 months)	2.05	(1.27 - 3.31)	0.003	Time length between primary and salvage surgery (< 36 months)	2.01	(1.23 - 3.28)	0.004
	Tumor size (≥ 30 mm)	1.72	(1.01 - 2.96)	0.046	Tumor size (≥ 30 mm)	1.67	(0.96 - 2.90)	0.048
	Her2 status (+++)	1.73	(1.17 - 2.55)	0.005				
	Hormonal therapy (yes)	0.69	(0.49 - 0.99)	0.046				

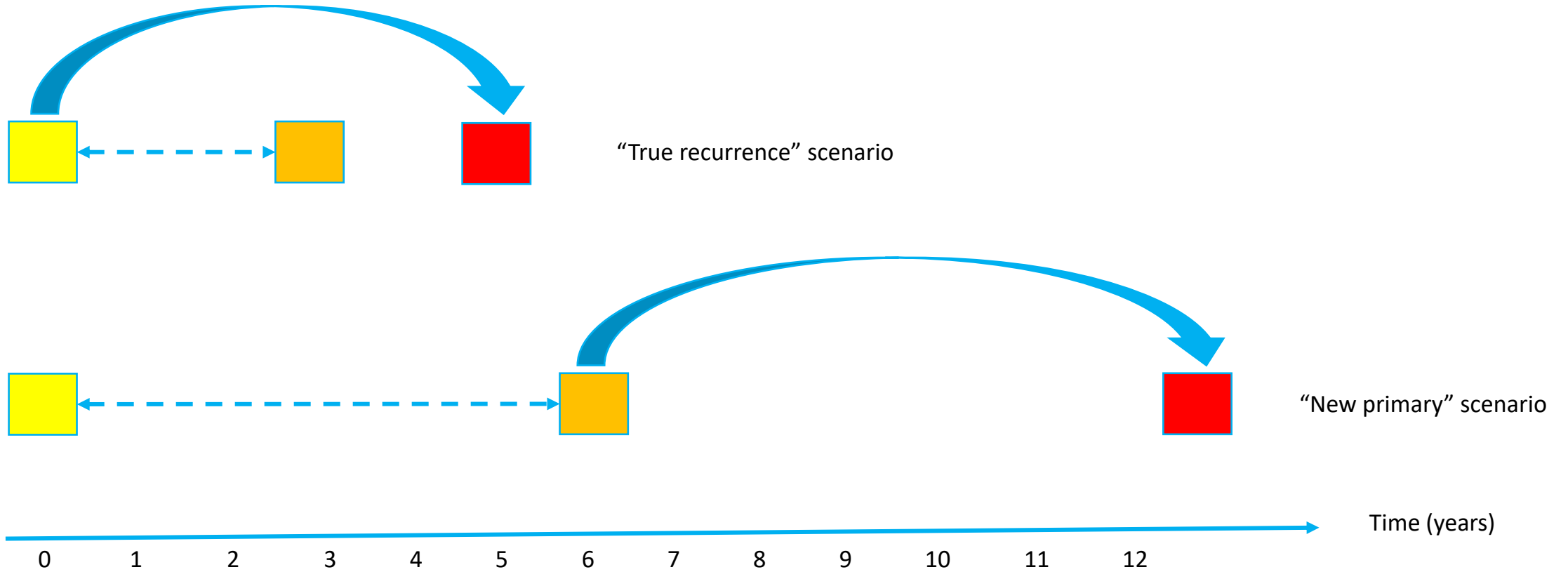
Distant metastasis-free survival in the matched dataset (n = 754 patients) according to the time length between primary and salvage surgery








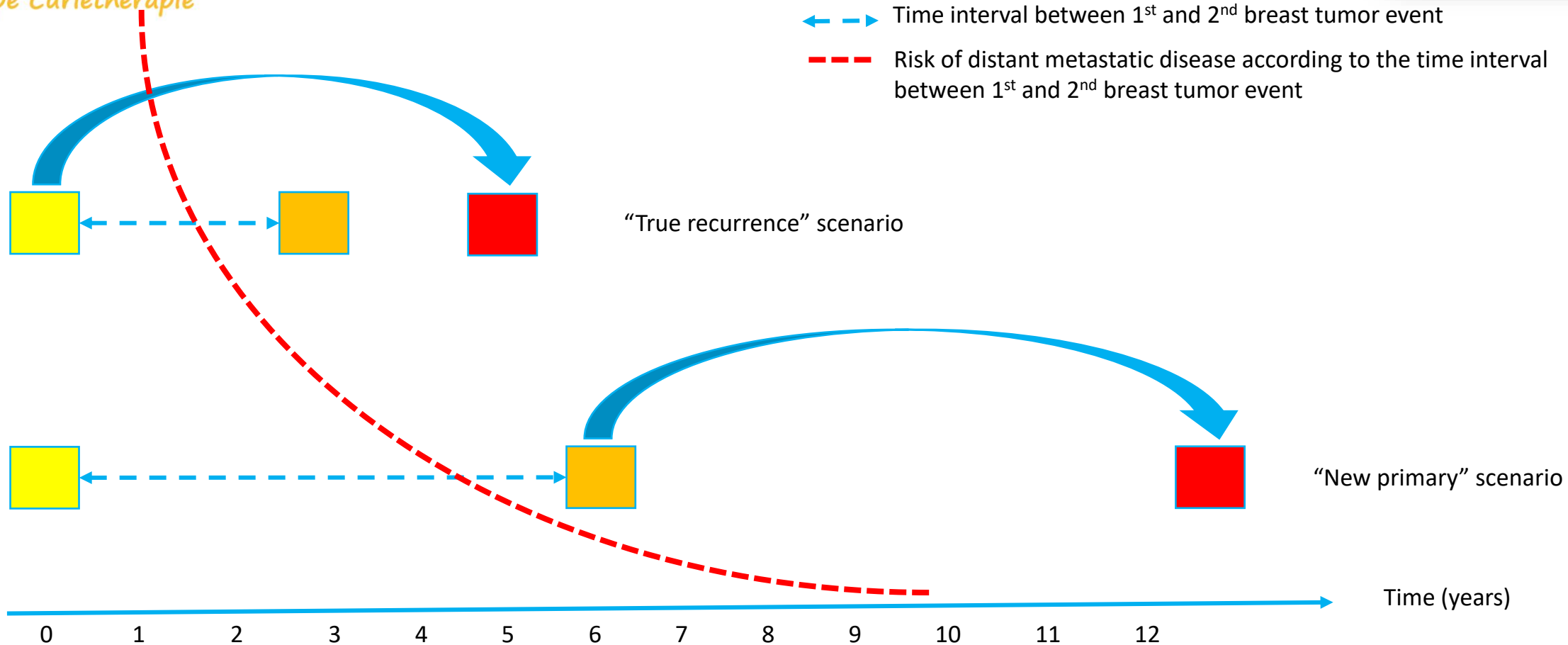
Distant metastasis-free survival in the matched dataset (n = 754 patients) according to the time length between primary and salvage surgery

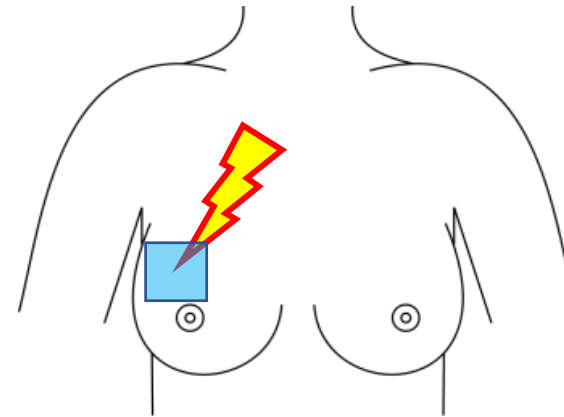
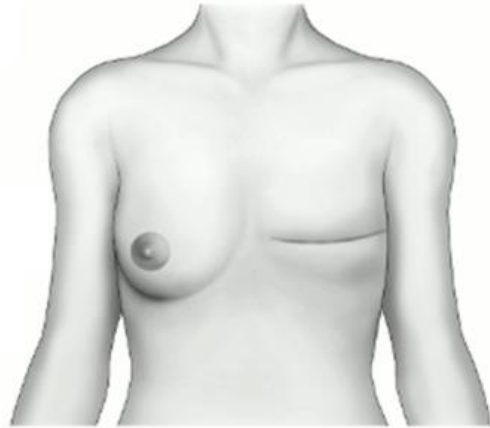


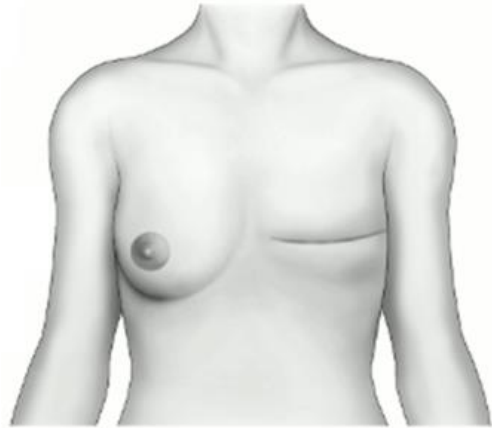
-  1st breast tumor event
-  2nd breast tumor event (IBTR)
-  1st breast metastatic event
-  Time interval between 1st and 2nd breast tumor event



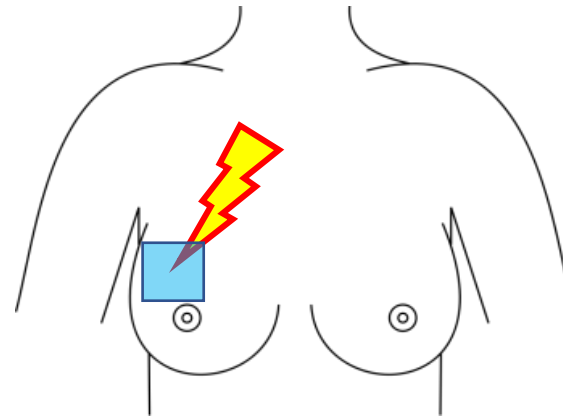
-  1st breast tumor event
-  2nd breast tumor event (IBTR)
-  1st breast metastatic event
-  Time interval between 1st and 2nd breast tumor event
-  Risk of distant metastatic disease according to the time interval between 1st and 2nd breast tumor event





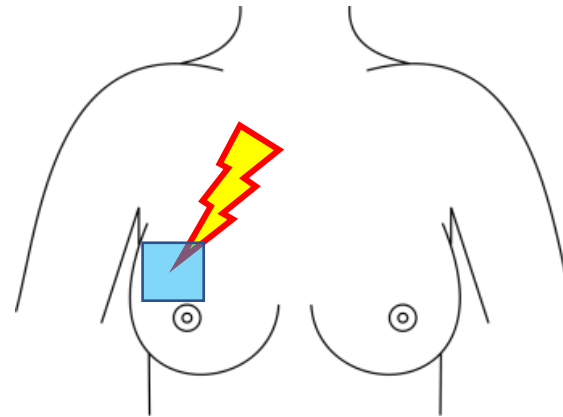
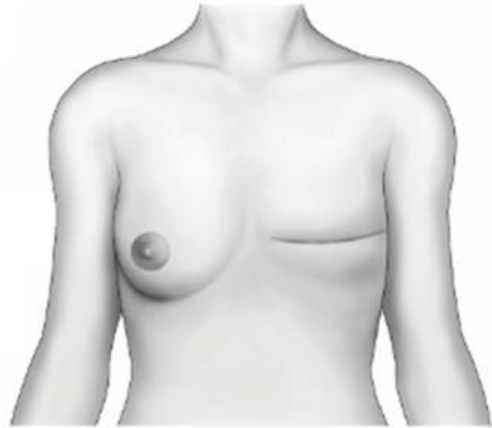


?



YES

But



YES



Table 3 Complications (type and grade) observed in the second conservative treatment cohort (283 complications observed for 377 patients)

Complications	Grade 1		Grade 2		Grade 3		Grade 4		Total	
	n	%	n	%	n	%	n	%	n	%
Cutaneous fibrosis	47	34.8	21	17.4	2	8.0	0	0.0	70	24.7
Sub-cutaneous fibrosis	38	28.1	67	55.4	13	52.0	1	50.0	119	42.1
Telangiectasia	15	11.2	9	7.4	1	4.0	0	0.0	25	8.8
Hyperpigmentation	21	15.6	7	5.8	1	4.0	0	0.0	29	10.2
Ulceration	1	0.7	0	0.0	3	12.0	1	50.0	5	1.8
Deformation	13	9.6	17	14.0	5	20.0	0	0.0	35	12.4
Total	135	47.7	121	42.8	25	8.8	2	0.7	283	100

Table 3 Complications (type and grade) observed in the second conservative treatment cohort (283 complications observed for 377 patients)

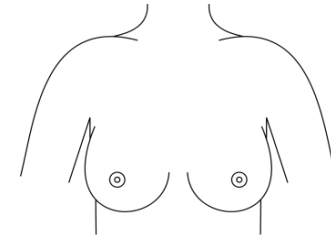
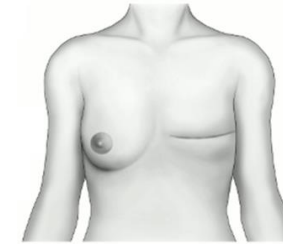
Complications	Grade 1		Grade 2		Grade 3		Grade 4		Total	
	n	%	n	%	n	%	n	%	n	%
Cutaneous fibrosis	47	34.8	21	17.4	2	8.0	0	0.0	70	24.7
Sub-cutaneous fibrosis	38	28.1	67	55.4	13	52.0	1	50.0	119	42.1
Telangiectasia	15	11.2	9	7.4	1	4.0	0	0.0	25	8.8
Hyperpigmentation	21	15.6	7	5.8	1	4.0	0	0.0	29	10.2
Ulceration	1	0.7	0	0.0	3	12.0	1	50.0	5	1.8
Deformation	13	9.6	17	14.0	5	20.0	0	0.0	35	12.4
Total	135	47.7	121	42.8	25	8.8	2	0.7	283	100

Cosmetic results in the 2nd CT cohort



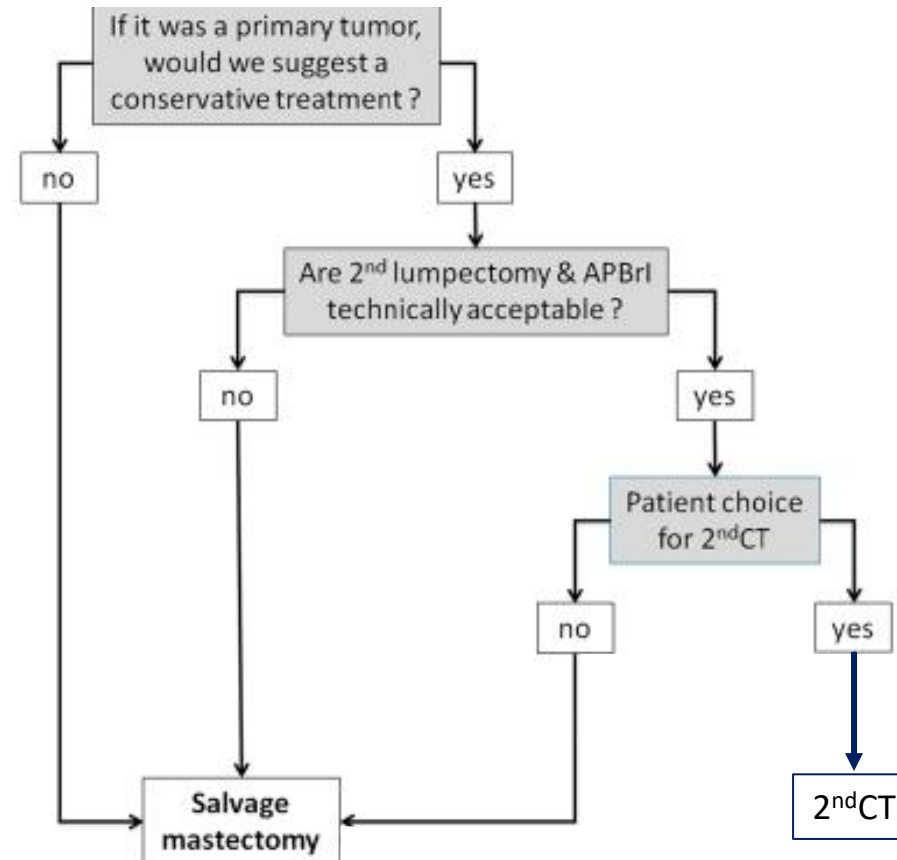
Development

- SM or 2ndCT: data from the literature
- **Indications of 2ndCT**
- Different techniques of re-irradiation of the tumor bed
- Conclusion



GEC-ESTRO APBI classification as a decision-making tool for the management of 2nd ipsilateral breast tumor event

Lucile Montagne¹ · Jocelyn Gal² · Marie-Eve Chand¹ · Renaud Schiappa² · Alexander T. Falk¹ · Rémy Kinj¹ · Mathieu Gauthier¹ · Jean-Michel Hannoun-Levi¹



APBI

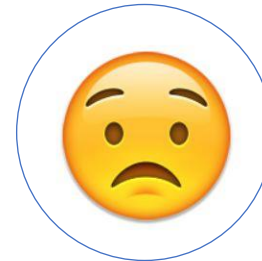
APBrI

3rdIBT-FS

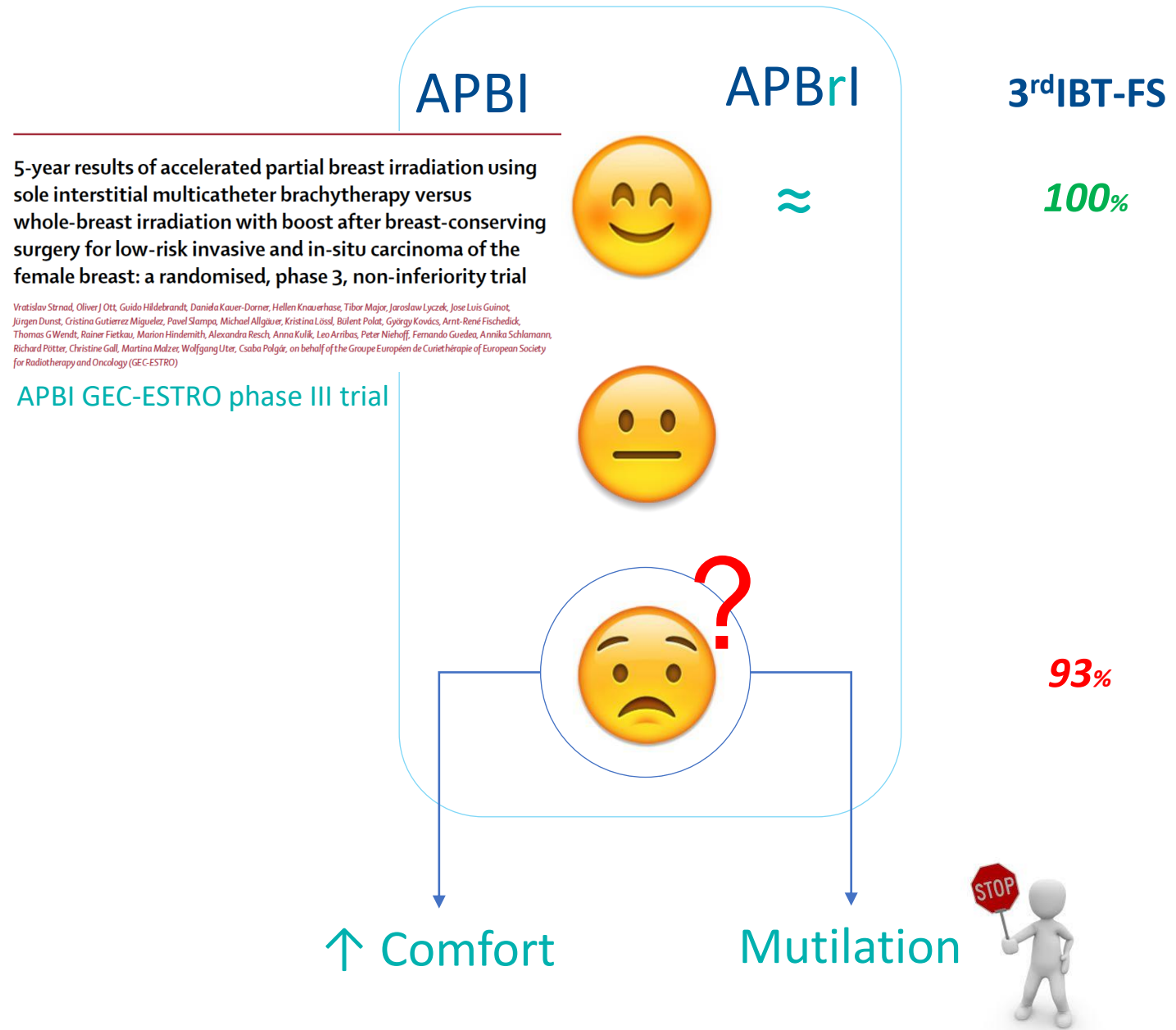
5-year results of accelerated partial breast irradiation using sole interstitial multicatheter brachytherapy versus whole-breast irradiation with boost after breast-conserving surgery for low-risk invasive and in-situ carcinoma of the female breast: a randomised, phase 3, non-inferiority trial

Vratislav Strnad, Oliver J Ott, Guido Hildebrandt, Danida Kauer-Dorner, Hellen Knauerhase, Tibor Major, Jaroslav Lyczek, Jose Luis Guinot, Jürgen Dunst, Cristina Gutierrez Miguelez, Pavel Slampa, Michael Allgauer, Kristina Lössl, Bülent Polat, György Kovács, Arnt-René Fischechick, Thomas G Wendt, Rainer Fietkau, Marion Hindemith, Alexandra Resch, Anna Kulik, Leo Arribas, Peter Niehoff, Fernando Guedea, Annika Schlamann, Richard Pötter, Christine Gall, Martina Malzer, Wolfgang Uter, Csaba Polgár, on behalf of the Groupe Européen de Curiethérapie of European Society for Radiotherapy and Oncology (GEC-ESTRO)

APBI GEC-ESTRO phase III trial



100%



Montagne L. et al. Breast Cancer Res Treat. 2019;176:149-157

Development

- SM or 2ndCT: data from the literature
- Indications of 2ndCT
- **Different techniques of re-irradiation of the tumor bed**
- Conclusion



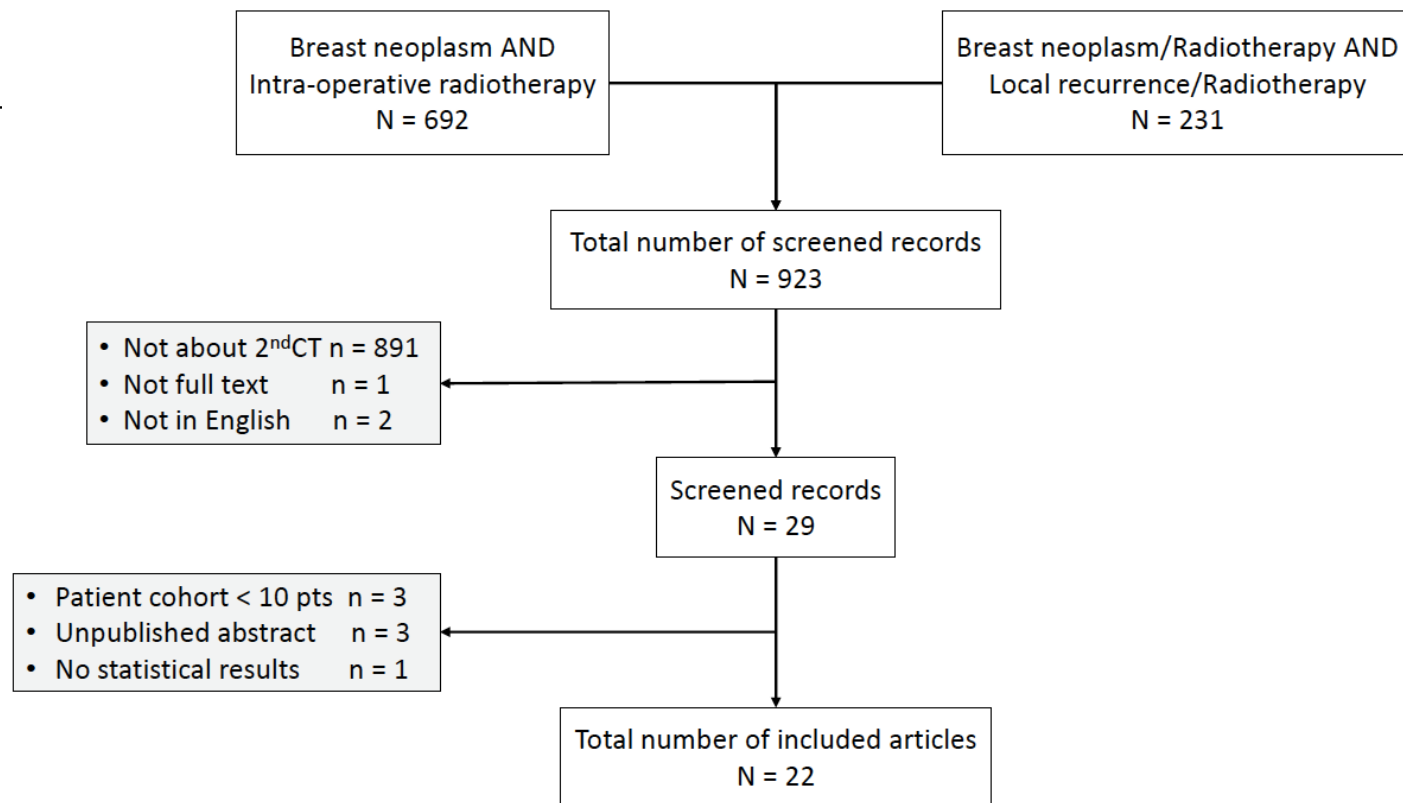
Review

Second conservative treatment for second ipsilateral breast tumor event: A systematic review of the different re-irradiation techniques

Lucile Montagne ^a, Arthur Hannoun ^b, Jean-Michel Hannoun-Levi ^{a,*}

^a Department of Radiation Oncology, Antoine Lacassagne Cancer Center, University of Cote D'Azur, Nice, France

^b University of Lyon 2, Lyon, France

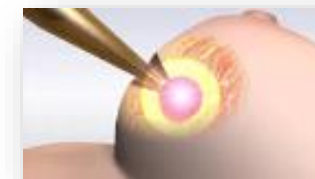


Brachytherapy



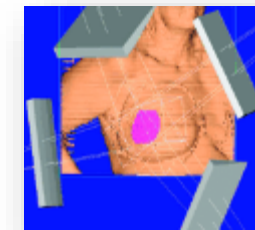
Authors	Year of publication	# pts	MFU (months)	Irradiation techniques	Dose (Gy)		3 rd IBTE-FS (%)	OS		≥ G3 tox. (%)
					Total (Gy)	Dose/f Dose rate		@	(%)	
Maulard C et al. [12]	1995	38	48	MIB LDR	30	–	a)	5 y	55	8
Resch A et al. [13]	2002	17	59	MIB PDR EBRT	12.5 30	0.5–1	b)	4 y	70	0
Hannoun-Levi JM et al. [14]	2004	69	50	MIB LDR	30–50	–	77.4	5 y	91.8	10.2
Niehoff P et al. [15]	2006	19	19	MIB HDR PDR	28 30	2.5 BID –	62.5	1.5 y	68.7	3
Chadha M et al. [16]	2008	15	36	MIB LDR	30–45	–	89	3 y	100	0
Guix B et al. [17]	2009	36	89	MIB HDR	30	2.5 BID	89.4	10 y	96.7	0
Hannoun-Levi JM et al. [18]	2011	42	21	MIB HDR	34	3.4 BID	c)	–	3	
Kauer-Dorner D et al. [19]	2012	39	57	MIB PDR	50.1	0.6–1	93	5 y	87	17
GEC-ESTRO [6]	2013	217	47	MIB LDR PDR HDR	46 50.4 32	4 BID	94.4	5 y 10 y	88.7 76.4	11
Trombetta M et al. [23].	2014	18	39.6	Balloon HDR	34	3.4 BID	d)	–	–	
Smanyko V et al. [20]	2019	39	59	MIB HDR	22	4.4 BID	94	5 y	81	8
Montagne L et al. [21]	2019	159	71	MIB HDR LDR	28–34 30–55	–	97.4	6 y	91.2	–
Forster T et al. [22]	2019	19	65	MIB PDR HDR	49.8–50.4 34.2–32	0.5–0.7 3.4–3.8	100	5 y	100	0

IORT



Authors	Year of publication	# pts	MFU (months)	Irradiation technique	Median Dose (Gy)	3 rd IBTE-FS (%)	5-y OS (%)	≥ G3 tox. (%)
Kraus-Tiefenbacher U et al. [26]	2007	17	26	50 kV X-rays	20	100	–	–
Chin C et al. [27]	2017	12	14	50 kV X-rays	20	100	–	0
Blandino G et al. [27]	2017	30	47	Electron beam	18	92.3	91.2	21
Thangarajah F et al. [24]	2018	41	58	50 kV X-rays	20	89.7	82	0

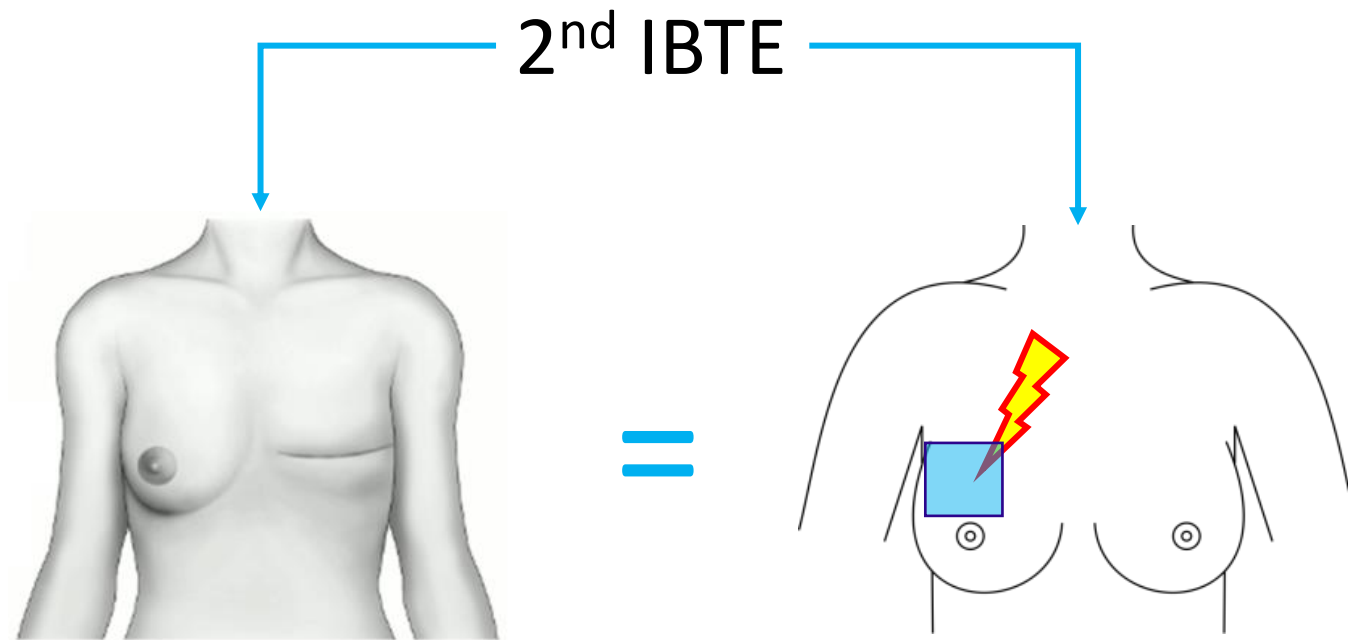
External Beam Radiation Therapy

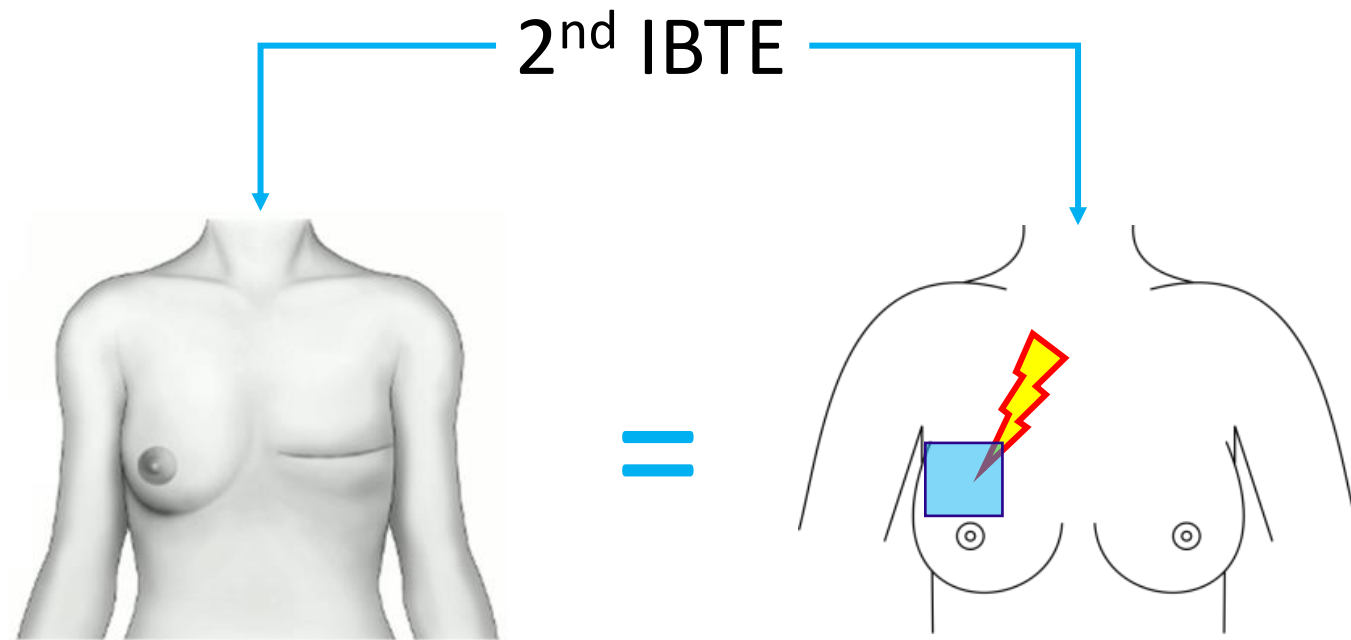


Authors	Year of publication	# pts	MFU (months)	Irradiation techniques	Dose (Gy)		3 rd IBTE rate (%)	5-y OS (%)	≥ G3 tox. (%)
					Total (Gy)	Dose/f			
Mullen E et al. [28]	1997	17	75	Cobalt + Electron	50	2	–	–	–
Deutsch M et al. [29]	2002	39	51.5	Electron	50	2	–	–	–
Janssen S et al. [30]	2018	83	35	3D CRT	45	1.8	14.5 ^a	76	0
Thorpe CS et al. [32]	2019	50	12.7	Proton	45–76	–	–	97	16
Arthur DW et al. [33]	2019	58	66	3D CRT	45	1.5 BID	5.2	95	7

Development

- SM or 2ndCT: data from the literature
- Indications of 2ndCT
- Different techniques of re-irradiation of the tumor bed
- **Conclusion**





Information, explanations,
Benefit/risk balance

