Impact of modern imaging on survival in a retrospective and consecutive cohort of 145 HR+/HER2 negative oligometastatic breast cancer

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Background

Recent randomized prospective OMBC studies, although inconclusive regarding the optimal therapeutic strategy, have identified major methodological requirements for future trials:

- Account for the **heterogeneity** of OMBC prognosis (biology, metastatic pattern, timing, de novo vs early vs late recurrent).
- Use of **consistant systemic treatments** to avoid misinterpretation
- Use of **Modern Imaging Methods** (MIMs : PET scan / WB MRI).
- **Long follow-up** consistent with expected survival.
- **Large recruitment** to maintain statistical power despite these limitations.

Objectives

Given the methodological constraints for future trials, we focused on a **recent and unselected consecutive HR+/HER2– OMBC** cohort to:

- Assess the **impact of imaging methods.**
- Evaluate the **impact of Local Ablative Therapy (LAT)** on survival.
- Identify **prognostic factors** for PFS and OS.

Methods

Design: Retrospective, unicenter, consecutive cohort (2012–2020)

Population: HR+/HER2– OMBC (1–5 metastases).

Data collected:

- Biology, number and location of metastases, imaging methods for staging, treatments.

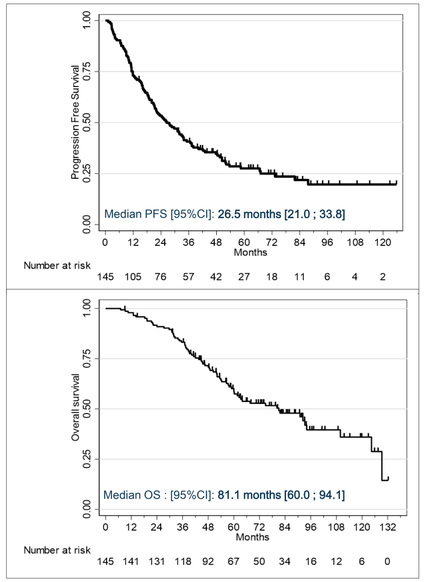
Statistical analysis:

- Survival estimated by Kaplan–Meier
- Prognostic factors assessed by Cox model, including time-dependent variable to prevent from immortal time bias.
- Results expressed as hazard ratios (HR) with 95% confidence intervals

A : Baseline characteristics

		Surrogate Intrinsic Subtype		
	Total	Luminal A-like	Luminal B-like	
	(N = 145)	(N = 34)	(N = 111)	*p-value*
Age at diagnosis of first metastases (years)				
Median	57	54	58	*0.755*
(Range)	(29;90)	(29;87)	(30;90)	
Synchronous vs Metachronous				
Synchronous	50 (34.5%)	12 (35.3%)	38 (34.2%)	*0.482*
Metachr. (<24m)	13 (9.0%)	1 (2.9%)	12 (10.8%)	
Metachr. (>=24m)	82 (56.6%)	21 (61.8%)	61 (55.0%)	
Number of metastases				
1-3	128 (88.3%)	32 (94.1%)	96 (86.5%)	*0.361*
4-5	17 (11.7%)	2 (5.9%)	15 (13.5%)	
Brain metastases				
Yes	7 (4.8%)	1 (2.9%)	6 (5.4%)	*1.000*
Liver metastases				
Yes	18 (12.4%)	3 (8.8%)	15 (13.5%)	*0.566*
Lung Metastases				
Yes	10 (6.9%)	3 (8.8%)	7 (6.3%)	*0.700*
Lymph node metastases				
Yes	20 (13.8%)	2 (5.9%)	18 (16.2%)	*0.161*
Bone metastases				
Yes	98 (67.6%)	26 (76.5%)	72 (64.9%)	*0.206*
Staging Imaging Methods				
MIMs	78 (53.8%)	24 (70.6%)	54 (48.6%)	***0.025***
SIMs	67 (46.2%)	10 (29.4%)	57 (51.4%)	
Local Ablative Treatment				
No	103 (71.0%)	19 (55.9%)	84 (75.7%)	***0.026***
Yes	42 (29.0%)	15 (44.1%)	27 (24.3%)	

B : OS and PFS for the whole cohort



C : OS and PFS : Multivariable analysis Cox time-dependent

	OS		PFS	
	HR [95%CI]	*p-value*	HR [95%CI]	*p-value*
Median Follow up [95%CI]: 82.8 mois [73.7 ;90.4]				
Synchronous vs Metachronous				
de novo	1.00		1.00	
Metachr. (<24m)	1.95 [0.88; 4.34]	*0.1000*	2.95 [1.46; 5.99]	***0.0027***
Metachr. (>=24m)	0.90 [0.53; 1.51]	*0.6863*	1.28 [0.83; 1.97]	*0.2651*
Number of organs with metastases				
2 vs 1	1.60 [0.67; 3.83]	*0.2925*	1.84 [0.88; 3.83]	*0.1043*
Number of metastases				
4-5 vs 1-3	1.75 [0.91; 3.36]	*0.0940*	1.66 [0.94; 2.90]	*0.0781*
Surrogate Intrinsic Subtype				
Luminal B vs A	2.19 [1.11; 4.34]	***0.0237***	1.22 [0.76; 1.95]	*0.4142*
Liver metastases				
Yes vs No	2.02 [1.05; 3.89]	***0.0361***	2.33 [1.32; 4.12]	***0.0036***
Staging Imaging technics				
SIMs vs MIMs	1.88 [1.12; 3.16]	***0.0173***	1.64 [1.08; 2.47]	***0.0192***
Local Ablative Treatment				
Yes vs No	0.52 [0.25; 1.08]	*0.0782*	0.52 [0.29; 0.91]	***0.0233***

D : Subgroup analysis of LAT impact on survival in MIMs-staged patients.

	OS		PFS	
	HR [95%CI]	*p*	HR [95%CI]	*p*
LAT*		*0.0080*		*0.0064*
No	1.00		1.00	
Yes	0.29 [0.12; 0.73]		0.40 [0.21; 0.77]	

** Cox time-dependent*

CONCLUSION

- HR+/HER2- tumors themselves comprise subgroups with variable prognoses.
- Modern Imaging Methods can identify OMBC with a better prognosis and OMBC more likely to benefit from LAT.
- In our cohort, LAT improve significantly DFS but not OS.