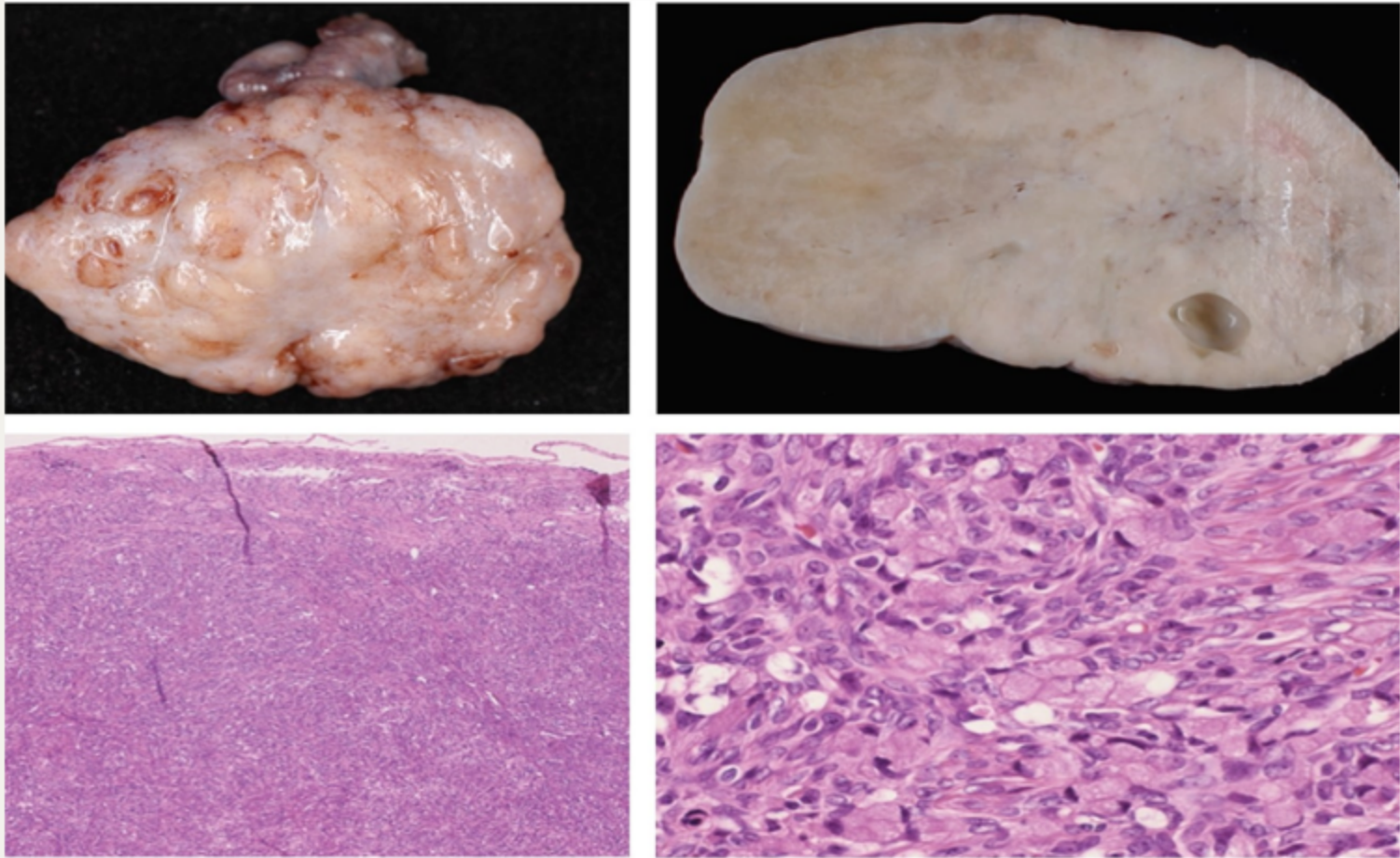


An analysis of the prognostic factors of Krukenberg tumours: a clinic-pathological review of 22 cases at a single treatment facility in Jamaica

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Introduction

Krukenberg tumours, a subset of metastatic ovarian malignancies specifically defined by stromal involvement and mucin producing signet rings cells, account for only 1-2% of all ovarian malignancies.¹⁻⁴ These tumours are a rare ovarian cancer by definition and are characterized by a poor prognosis due to its aggressiveness and difficulty in diagnosing the disease.^{2-3,5} The prognostic factors of patients with Krukenberg tumours, are varied in nature and arguably include the location of the primary tumour, the absence of metastatic lesions following surgery, metastasectomy, and the treatment modality.



Objective

The aim of this study was to determine the overall survival of patients with Krukenberg tumours and to identify the prognostic factors for overall survival in patients with Krukenberg tumours, particularly those which may be unique to the study population.

Methodology

The study was a retrospective descriptive study of all the patients diagnosed with Krukenberg tumours at the University Hospital of the West Indies (UHWI), Mona Campus over the years 1990-2018.

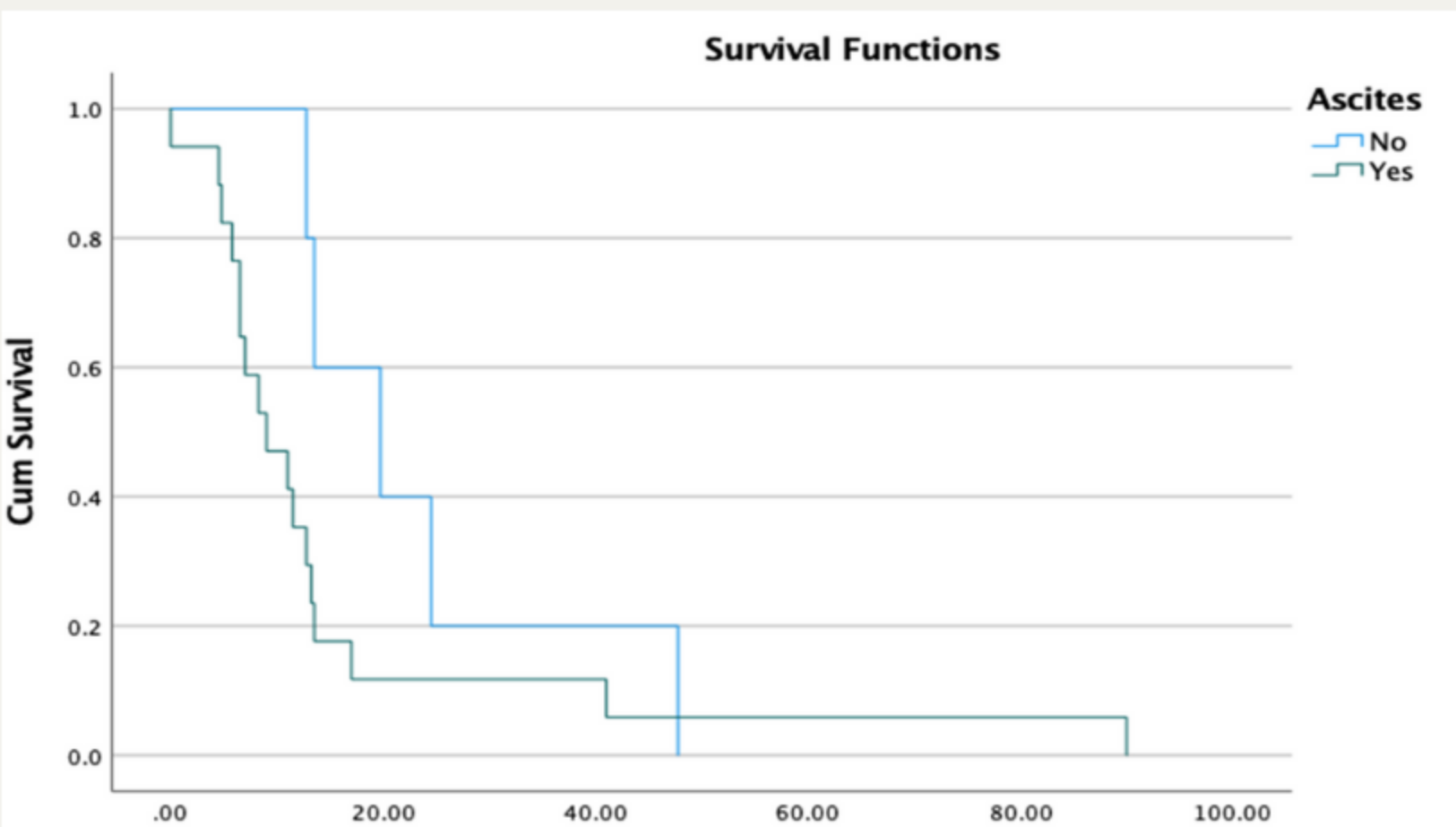
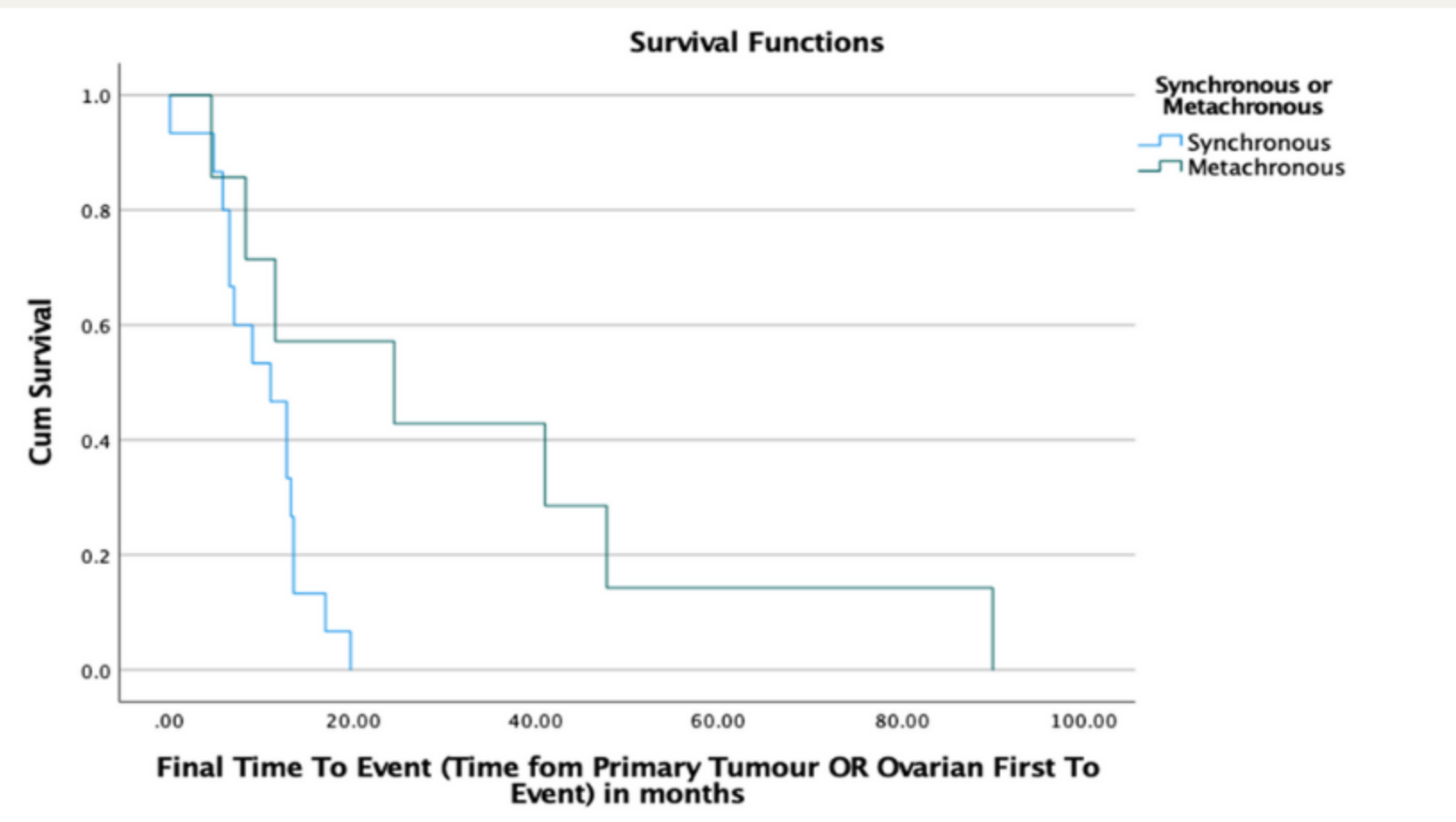
Methodology Cont'd

A docket review of each participant to elicit information about:

- the location of the primary tumour,
 - size of ovarian metastasis,
 - timing of the ovarian metastasis (synchronous vs metachronous),
 - the type and extent of surgery performed,
 - the completeness of cytoreduction,
 - the extent of metastatic disease
 - the survival/death rate.
- The overall survival (OS) of patients was the main comparator per category in identifying the prognostic factors.

Results

- A total of 22 patients were evaluated and included in this study with a median age of 52 years old and median survival time of 11.5 months (95% CI: 7.19-15.81 months).
- Seven patients (31.8%) who had metachronous disease, exhibited a statistically significantly longer overall survival (OS) than 15 patients (68.2%) with synchronous metastases: The median survival times were 24.5 months (95% CI 0 – 57.9) and 11 months (95% CI 5.6 – 16.4) for metachronous and synchronous cancers respectively.
- The presence of ascites translated to a median overall survival of 9 months (95% CI 3.6-14.4) in comparison to those without ascites who enjoyed an increased median overall survival time of 19.8 months (95% CI 6.3 – 33.2) (p-value 0.041).
- All other factors were not shown to be statistically significant indicators of overall survival. The primary tumour site and the conjunctive use of chemotherapy following cytoreductive surgery were also independent factors which correlated with increased overall survival.



Analysis

Table 2: Univariate analysis of overall survival times in months			
	Median (months)	95% Confidence Interval(months)	P value (log-rank)
Overall Survival	11.5	7.19 – 15.81	
Primary Tumour Site			
Breast	47.8	0 – 110.9	0.11
Stomach	4.5	?	
Colorectal	13.5	9.2 – 17.8	
Other	9	2.2-15.8	
Chronology			
Metachronous	11	5.6 – 16.4	0.023
Synchronous	24.5	0 – 57.9	
Extent of Disease			
Confined to Ovary	11	3.7 -18.4	0.51
Spread to Pelvis	11.5	4.0 – 19.0	
Ascites			
Ascites Present	9	3.6 -14.4	0.041 (<i>Breslow</i>)
Ascites Absent	19.8	6.3 – 33.2	
Chemotherapy			
Administered	13.3	2.7 – 23.8	.38
Not administered	11	6.1 – 15.9	
Completeness of Cytoreduction			
Complete cytoreduction	11.5	6.5 – 16.	.62
Incomplete cytoreduction	12.8	0 -27.8	

Discussion

- Overall Survival in this study was largely congruent with other studies having median survival times between 9-11 months.
- Primary tumour site revealed to be a prognostic factor in other studies, but no such significance revealed in this study. Inconsistent finding perhaps a function of the small sample size.
- The majority of the studies reviewed revealed that metachronous cancer was associated with longer overall survival times whilst synchronous ovarian disease was a risk factor affiliated with negative prognosis.^{1,3} This finding was consistent with this study
- Not dissimilarly with other studies which found that ascites is an independent factor in predicting unfavourable prognosis in Krukenberg tumours, in this study we found that patients with presence of ascites had a median overall survival time of 9 months which contrasted drastically with a median survival time of 19.88 months for those who did not present with ascites

Table 3: Prognostic Factors for Krukenberg Tumours				
Factors	Univariate analysis		Multivariate Analysis	
	HR (95% CI)	p-value	HR (95% CI)	p-value
Age (≤ 50 yrs vs > 50 yrs)	1.09(0.43 – 2.66)	0.85		
Menopausal status (pre vs postmenopausal)	0.92(0.38 – 2.22)			
Primary Site: Stomach vs colorectal	0.70(0.13 – 3.79)	0.68		
Primary Site Stomach vs Breast	0.14(0.01 – 1.70)	0.12		
Primary Site Stomach vs Other	1.35(0.29 -6.36)	0.70		
Ovarian involvement Unilateral vs Bilateral	1.47(0.57 – 3.82)	0.43		
Extent of Disease: Ovary vs Pelvis	1.40(0.51 – 3.85)	0.51		
Ovarian Tumour Diameter(≤ 10cm vs > 10cm)	0.73(0.27 – 1.94)	0.53	1.51(0.47 – 4.86)	0.49
Synchronous vs metachronous	3.95(1.09 – 14.27)	0.036*	4.72(1.05-21.16)	0.043*
Chemotherapy (Yes vs No)	1.53(0.58 – 4.02)	0.39	1.20(0.42-3.44)	0.74
Cytoreduction: Complete vs Incomplete	0.78(0.28 – 2.16)	0.63	0.97(0.30 – 3.18)	0.96
Ascites (yes vs No)	0.48(0.17 - 1.34)	0.16		
Cox proportional Hazard Model * Statistically significant				

Conclusion

Metachronous disease and the absence of ascites are favourable prognostic factors for patients with Krukenberg tumours in this Afro-Caribbean population of patients

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