



RESPONSE TO CONCURRENT EXTERNAL BEAM RADIOTHERAPY AND CHEMOTHERAPY AS A NEW PREDICTOR FOR OVERALL SURVIVAL IN LOCALLY ADVANCED CERVICAL CANCER – A RETROEMBRACE STUDY NOMOGRAM

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Objective

To present the first nomogram for prediction of overall survival (OS) in locally advanced cervical cancer patients undergoing definitive radio-chemotherapy including image guided adaptive brachytherapy (IGABT)

Material and Methods

- 720 patients with a diagnosis of LACC (squamous cell-, adeno- or adenosquamous histology)
- Median F/U 56 months (range 4 - 169)
- All were treated with RCT including IGART in 12 different institutions
- 248 deaths occurred over the observation period
- 13 candidate predictors for overall survival were considered (evidence based and clinical expertise)
- Missing data (7.2% of all data points) were imputed by multiple imputation (more favourable situation)

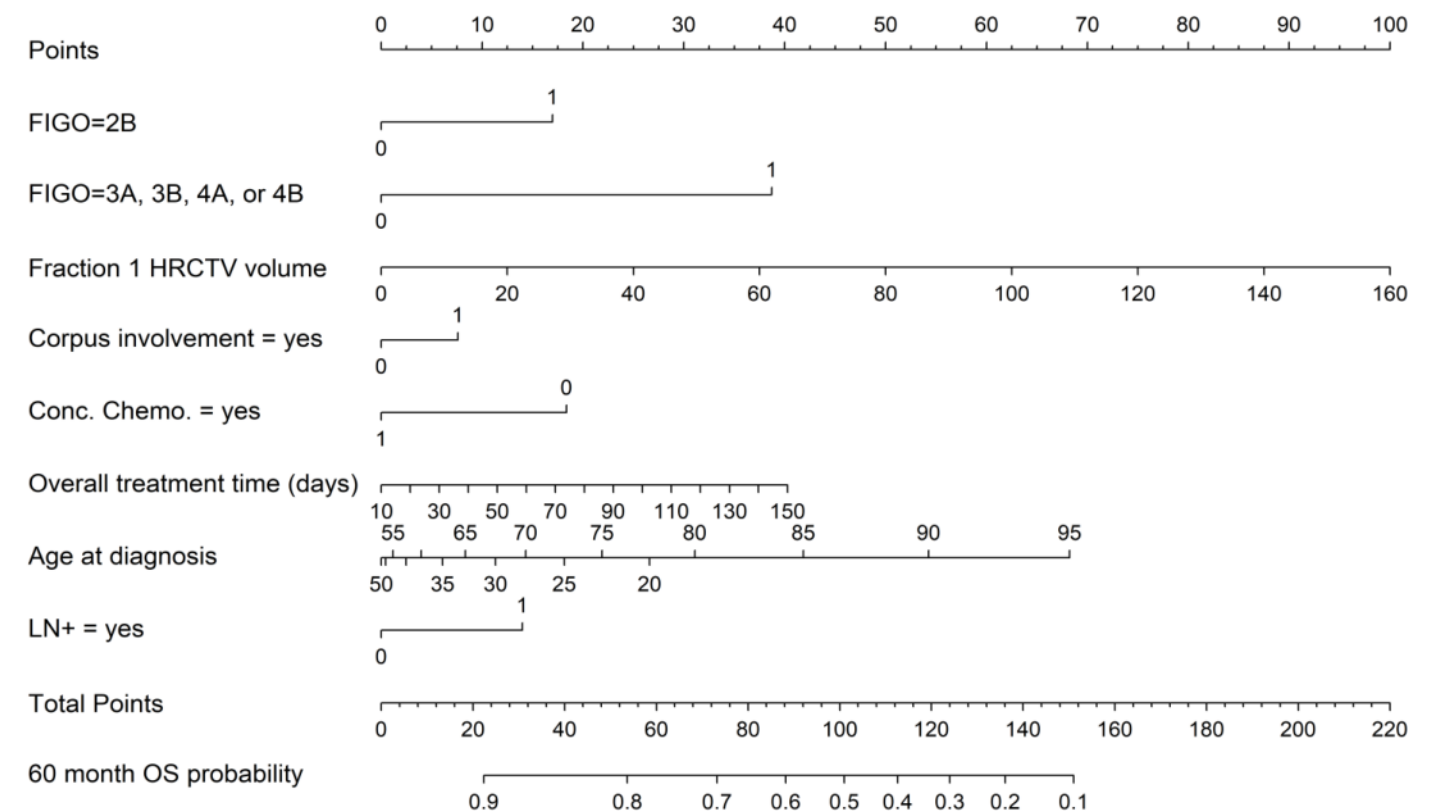


Figure: Nomograms for OS

- A multivariable Cox model for overall survival (OS) stratified by center was built to assess the statistical significance (alpha level = 0.05) and effect (hazard ratios (HR)) on overall survival of all predictor variables
- Stepwise selection with the AIC criteria was then utilized to obtain a predictive model and to construct a nomogram for survival predictions 60 months after diagnosis
- The nomogram was internally validated using a calibration plot to assess model calibration and the concordance c-index as a measure of discrimination optimism-corrected by bootstrap cross-validation

Table: Variable selection and significance

Variable		UA HR and 95% CI	m- Cox HR and 95% CI	Stepwise selection (AIC) HR
Age	linear	1.02 [1.01, 1.03]*	0.95 [0.89, 1.02]	0.93
	squared		1.00 [1.00, 1.00]	1.001
Hemoglobin (diagnosis)	g/dl	0.86 [0.79, 0.94]*	0.98 [0.88, 1.08]	-
FIGO Stage	2B vs.1A,1B,2A	1.73 [1.16, 2.57]*	1.62 [0.98, 2.67]	1.50
	3A,3B,4A,4B vs.1A,1B,2A	4.15 [2.76, 6.25]*	3.24 [1.80, 5.83]*	2.53
Tumour width (MRI)	mm	1.02 [1.01, 1.03]*	1.00 [0.99, 1.01]	-
Corpus involvement	yes vs. no	1.48 [1.10, 1.98]*	1.17 [0.85, 1.60]	1.20
Lymph nodes	N1 vs. N0	1.47 [1.13, 1.89]*	1.46 [1.10, 1.94]*	1.40
Concurrent chemo.	yes vs. no	0.52 [0.39, 0.69]*	0.59 [0.40, 0.87]*	0.64
OTT	months	1.02 [1.01, 1.03]*	1.01 [1.00, 1.02]	1.01
CTV _{HR} Volume (BT)	cm ³	1.02 [1.01, 1.02]*	1.01 [1.01, 1.02]*	1.02
CTV _{HR} D90	Gy	0.97 [0.96, 0.98]*	0.99 [0.98, 1.00]	-

*Significant results (p<0.05), +Highly significant results (p<0.001), Hazard Ratio (HR), Confidence Interval (CI)

Less hydronephrosis, parametrial involvement and histology

Results

- Ten factors were statistically significant in Univariate Analyses
- Four in multivariable Cox model
- Seven factors selected through the predictive model AIC
- The nomogram was created with satisfactory calibration and useful discrimination (concordance probability c=0.74)

Conclusion:

- This is the first nomogram to predict OS in LACC patients treated with IGABT
- Previously reported factors : age, FIGO stage, corpus involvement, chemotherapy delivery, overall treatment time and lymph node involvement were reconfirmed as important outcome predictors
- Response to radiochemotherapy (volume of CTV_{HR} at first BT) seems to be a new essential outcome predictor
- The result of the calculation may help clinicians offer better patient counseling on clinical outcome