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178P Interpretable AI to predict anal cancer local failure at 3 years with the FFCD Anabase prospective multicentric cohort

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Background: Machine learning (ML) has transformed oncological risk prediction by enabling personalized therapeutic strategies. Local tumor control remains a critical endpoint in anal cancer management. This study aimed to develop and validate an explainable ML model for predicting local recurrence at 3 years in patients with anal cancer.

Methods: We analyzed data from the prospective multicentric FFCD-Anabase cohort, comprising 1,015 patients with anal cancer treated with chemoradiotherapy across 60 French centers between January 2015 and April 2020. The endpoint was local recurrence at 3 years. An extreme gradient boosting model with an Accelerated Failure Time extension was developed to handle time-to-event data. Model development incorporated cross-validation for hyperparameter optimization, followed by calibration to ensure reliable probability estimates. Performance was assessed using discrimination, calibration metrics, and clinical utility measures. Model interpretability was enhanced using Shapley Additive exPlanations values, providing global feature importance and individual patient-level prediction explanations.

Results: The model demonstrated a C-index of 78% and an AUC-ROC at 3 years of 83%. The model achieved a sensitivity of 74% and specificity of 85%, with positive and negative predictive values of 70% and 87%, respectively. Overall accuracy was 81% with an F1-score of 72%. Calibration performance was assessed using Brier score (0.152) and integrated Brier score (0.147). Calibration plots demonstrated good agreement between predicted and observed probabilities. Decision curve analysis revealed net clinical benefit across a range of threshold probabilities, with optimal risk stratification at a 44% probability threshold for distinguishing low- and high-risk patients. Kaplan-Meier survival analysis confirmed statistically significant differences between risk groups ($p < 0.05$). Model interpretability analysis using SHAP values identified tumor size as the most influential predictor.

Conclusions: Our model yielded good performances on real-world data to predict the risk of local recurrence at 3 years for anal cancer.

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179P Personalized artificial intelligence model for longitudinal prediction of long-term survival in advanced ovarian cancer

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Background: Accurate prediction of long-term survival in epithelial ovarian cancer (EOC) can guide risk-adapted treatment, support survivorship care, and refine clinical trial stratification. We developed a personalized AI model for dynamic prediction of long-term survival at three key timepoints.

Methods: We included FIGO III—IV EOC patients who underwent primary debulking surgery (PDS) or interval debulking surgery (IDS) in a single institution (2009 — 2024). The primary outcome was vital status at 72 months, with survival at 72 months used as a surrogate for long-term survival. Various models were tested. Predictions were computed at three timepoints: T0 (diagnosis), T1 (post-surgery), and T2 (6 months after adjuvant chemotherapy). Patients without sufficient follow-up were managed through inverse probability of censoring weighting (IPCW). Data were split into training (70%) and testing (30%) sets. Model performance was assessed by area under the ROC curve (AUC) with 95% bootstrap confidence intervals [CI]. Predictive variables were identified through permutation importance analysis (normalized importance >0.6).

Results: Of 2415 patients, we analysed 1688 (920 PDS, 768 IDS) with complete data. IPCW-adjusted logistic regression ensured optimal robustness and interpretability. Model performance improved across treatment, reaching its highest accuracy at T2, and better results in the PDS cohort compared to IDS (Table). Key predictors shifted dynamically — at T0: BMI and CA125 for PDS, Charlson Comorbidity Index (CCI) for IDS; at T1: platelets and residual tumor (RT) for PDS, CCI and RT for IDS; at T2: recurrence < 6 months, RT, and platelets for PDS, recurrence < 6 months and Bevacizumab maintenance for IDS.

Table: 179P Median AUC values across timepoints with 95% [CI]

Cohort	T0	T1	T2
PDS	0.60 [0.51—0.68]	0.73 [0.65—0.80]	0.77 [0.70—0.84]
IDS	0.58 [0.50—0.67]	0.66 [0.56—0.77]	0.74 [0.64—0.82]

Conclusions: Our personalized AI model dynamically predicts long-term survival in advanced EOC, with performance improving over time. Integrating clinical and surgical variables, it supports risk stratification. Prospective validation is required.

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180P Trajectories of gastrointestinal symptoms by sex in colon cancer survivors

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Background: Problems such as diarrhea, constipation, nausea/vomiting, and appetite loss related to colon cancer (CC) and its treatments may persist years after treatment has ended, albeit with potential sex differences. We applied machine learning tools