Kaplan-Meier survival estimates

HR [Group H1 vs H3]: 0.72(0.60-0.88), *p<0.001*
HR [Group H2 vs H3]: 0.62(0.51-0.75), *p<0.001*

Number at risk

	0	24	48	72	96	120	144
H1	2189	1902	1242	675	201	10	7
H2	2381	2107	1503	893	272	26	9
H3	9374	8269	5182	2511	629	33	19

PD54-03

ARTIFICIAL INTELLIGENCE IN ROBOTIC-ASSISTED LAPAROSCOPIC PROSTATECTOMY: DEVELOPING PREDICTIVE MODELS FOR POSITIVE SURGICAL MARGINS

Stephen Schmit*, Rebecca Ortiz, Philip Caffery, Christopher Tucci, Carsten Eickhoff, Elias Hyams, Gyan Pareek, Providence, RI

INTRODUCTION AND OBJECTIVE: Patients with localized prostate cancer increasingly elect for robotic-assisted laparoscopic prostatectomy (RALP), but this approach may be less preferred when adjuvant therapy is indicated. Adjuvant therapy improves survival but is associated with significant psychological distress and additional treatment complications. The presence of positive surgical margins after RALP is an important indication for adjuvant therapy. The goal of this study was to explore deep learning models for the prediction of positive surgical margins with preoperative data.

METHODS: Patient data from a single academic institution was pre-processed to train two artificial intelligence models: a feedforward multilayer perceptron and a random forest model containing 100 trees. A total of 9 preoperative variables were used for model training (prostate specific antigen value, positive biopsy cores, Gleason score on biopsy, perineural invasion on biopsy, body mass index, tobacco use history, family history of cancer, preoperative prostate volume, and age at diagnosis). Model construction was performed using the Python programming language.

RESULTS: Data preprocessing yielded a final sample of 461 patients. The optimized neural network demonstrated successful learning with loss minimization over 100 epochs (Figure 1) and a maximum area under the curve (AUC) of 0.60. The random forest model demonstrated an AUC of 0.55 (Figure 2).

CONCLUSIONS: Neither model demonstrated significant accuracy in predicting positive surgical margins with preoperative structured data. The integration of structured data may be insufficient for predicting margin status. Future models that utilize raw imaging information should be explored. For example, a convolutional neural network that is trained on preoperative multiparametric resonance imaging data may be a superior approach.

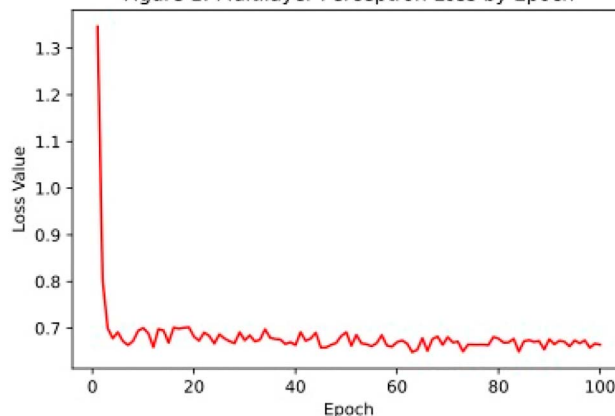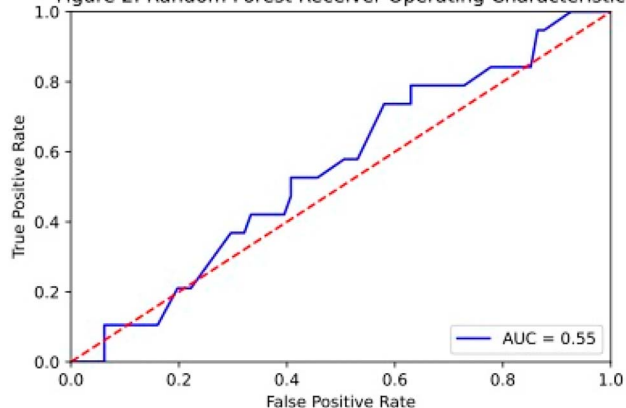Figure 1: Multilayer Perceptron Loss by Epoch

Figure 2: Random Forest Receiver Operating Characteristic

AUC = 0.55

PD54-04

CHALLENGING THE DOGMA: SHOULD UNILATERAL PELVIC LYMPH NODE DISSECTION BE ENVISIONED IN THE MULTIPARAMETRIC PROSTATE MRI ERA?

Alberto Martini*, Milan, Italy; Lieke Wever, Utrecht, Netherlands; Arnas Rakauskas, Lausanne, Swaziland; Christian Daniel Fankhauser, Josias Bastian Grogg, Zurich, Swaziland; Enrico Checcucci, Daniele Amparore, Turin, Italy; Guillaume Ploussard, Toulouse, France; Claudia Kesch, Essen, Germany; Fabio Zattoni, Udine, Italy; Alessandro Marquis, Giancarlo Marra, Turin, Italy; Maria Apfelbeck, Munich, Germany; Ugo Giovanni Falagario, Foggia, Italy; Otto Ettala, Turku, Finland; Mario de Angelis, Donato Cannoletta, Alberto Briganti, Francesco Montorsi, Milan, Italy; Ivan Jambor, Turku, Finland; Alexander Kretschmer, Munich, Germany; Veeru Kasivisvanathan, London, United Kingdom; Jan Philipp Radtke, Essen, Germany; Hubert John, Winterthur, Switzerland; Peter K Chiu, Honk Kong, China, People's Republic of; Francesco Porpiglia, Turin, Italy; Thomas Hermanns, Zurich, Swaziland; Roderick C. N. Van den Bergh, Utrecht, Netherlands; Giorgio Gandaglia, Milan, Italy; Massimo Valerio, Lausanne, Swaziland

INTRODUCTION AND OBJECTIVE: The specificity of current models for the preoperative prediction of lymph node invasion (LNI) is relatively low. Many times, the lymph nodes removed are negative and in case of nodal involvement, this is rarely bilateral. On these premises, we aimed to test the feasibility of unilateral lymph node dissection in a population of patients diagnosed and staged after the routine introduction of mpMRI-targeted biopsy in clinical practice.

METHODS: We relied on a multi-institutional dataset encompassing data from 15 European centers. All patients were cN0