Treatment of Locally Advanced Pancreatic Cancer with Irreversible Electroporation: Predictors of Survival

Khaleel D Wilson[1], Edward J. Kruse[2]*, Matthew J Weiss[3]*, John D. Christein[4]^, Rebekah R. White[5]^, Kai-Wen Huang[6], Robert CG Martin II, MD, PhD[1]*

*Department of Surgery, Division of Surgical Oncology, [1]University of Louisville School of Medicine, [2]Augusta University Medical Center, [3]Johns Hopkins University, [4]University of Alabama, ^Division of Gastrointestinal Surgery, [5]University of California San Diego Moores Cancer Center, and [6]National Taiwan University Hospital, Zhongzheng, Taipei, Taiwan

INTRODUCTION

- Pancreatic cancer is the 3rd leading cause of cancer related mortality in the U.S.
- Historically surgical resection was the only curative treatment.
- Unfortunately diagnosis of a locally advanced tumor was considered unresectable and resulted in a poor prognosis.
- Recently however Irreversible Electroporation (IRE) has lead to improved survival outcomes.
- Advancements in chemotherapy have also been shown to be beneficial.
- Optimization of the multimodal treatment of this disease is what remains to be established.

PURPOSE OF STUDY

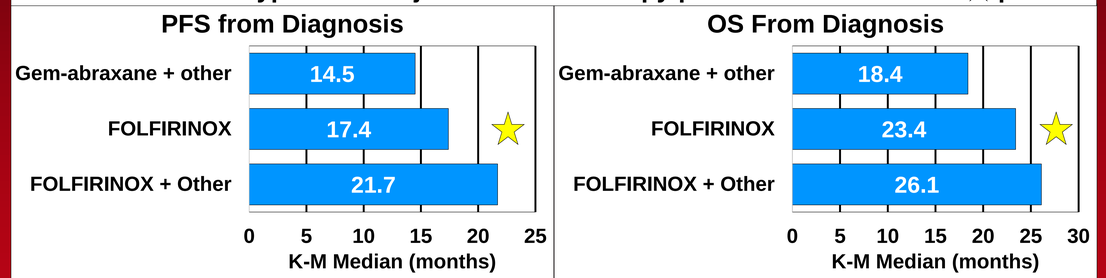
- Determine if pre-IRE factors can be used to better predict optimal patient selection for IRE.
- Compare survival outcomes for treating LAPC with surgical resection vs IRE ablation alone.

METHODS

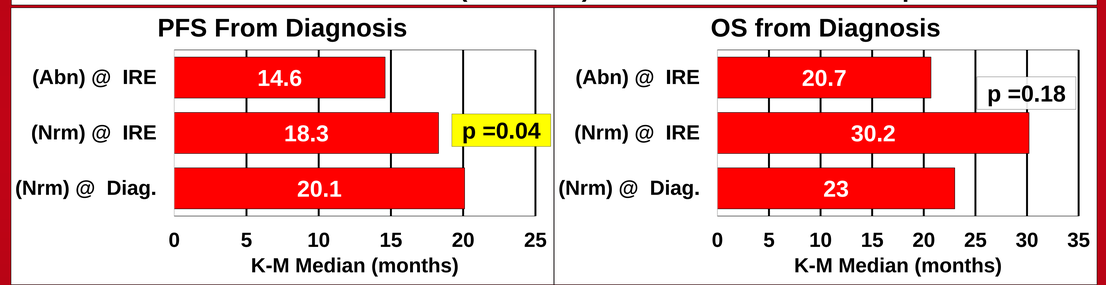
- Data was prospectively collected from an IRB approved registry of LAPC patients who underwent IRE between July 2015-May 2019.
- The RECIST 1.1 criteria was used to access tumor response and radiological progression.
- Kaplan-Meier (KM) survival analyses curves were used for overall survival (OS) and progression-free survival (PFS).
- Multivariate analysis, Chi Squared, and Fisher's Exact test were used for statistics.
- Null hypothesis rejected a p < 0.05.

RESULTS

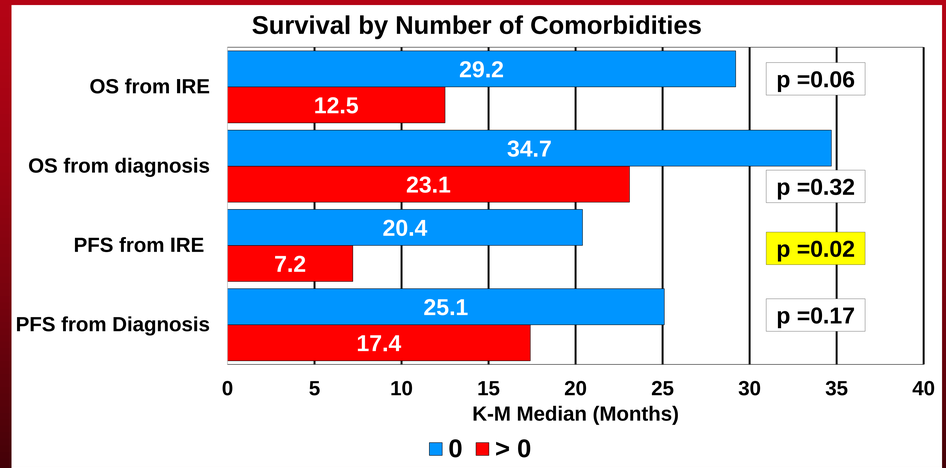
Survival based on type of neoadjuvant chemotherapy prior to IRE treatment. ★ p< 0.01



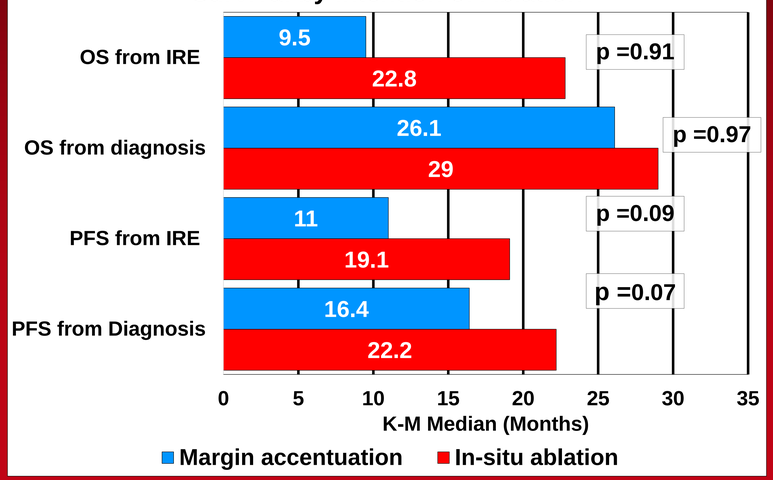
Survival based on normalization (<37 U/mL) of tumor marker CA 19-9 prior to IRE.



Survival by Number of Comorbidities



Survival by Intention of Ablation



CONCLUSIONS

- Achieving optimal CA 19-9 response to FOLFIRINOX based chemo was associated with improved survival outcomes.
- This can be used as a tool for optimal patient selection to IRE.
- Pancreatic resection with IRE margin accentuation showed no survival advantages over ablation via IRE for Stage III (LAPC)

FUTURE STUDY

A Randomized, Multicenter, Controlled, Unblinded Study to Assess the Safety and Efficacy of the NanoKnife® System for the Ablation of Unresectable Stage 3 Pancreatic Adenocarcinoma

ACKNOWLEDGEMENTS

Research was supported by the University of Louisville Cancer Education Program and the NIH/NCI (R25- CA134283) grant.