Efficacy of Non-Thermal Photodynamic Therapy delivered in peri pancreatic vessels: a POC Swine Study

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Summary

We aim at developing a new therapy to improve results of curative surgery in pancreatic cancer patients. Our goal is to clear tumor from vascular structures relying on photodynamic therapy (PDT) - a *non-thermal* ablative therapy that utilizes photosensitizers activated by specific light. [1]

For that, a proprietary light-emitting catheter prototype was developed to deliver energy with enough precision within intrapancreatic vessels under image guidance, without damaging the vessel wall.

The underlying hypothesis is that systemic delivery of photosensitizer and intravascular light source could result in perivascular tissue necrosis.

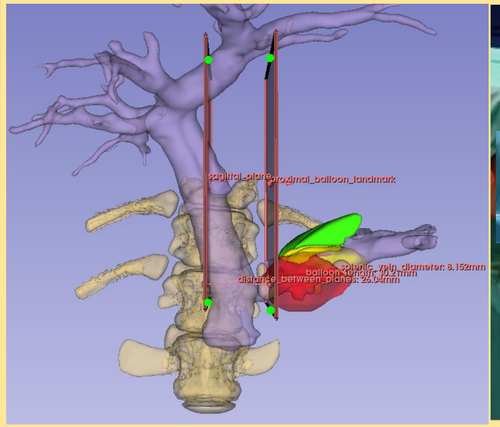
Preliminary Results

PDT via the endovascular route can produce a zone of circumferential perivascular necrosis. No vessel wall damage was found in a 7 days survival model.

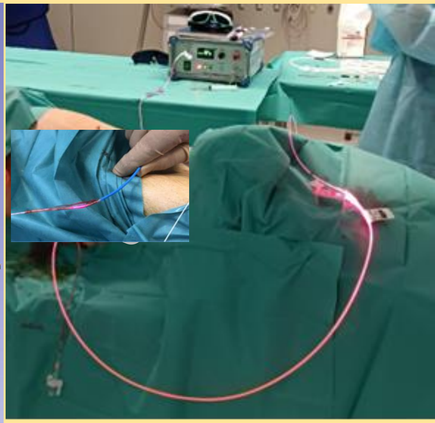
This work provides an in vivo proof of concept of PDT therapy delivered intravascularly, in acute and chronic swine models.

Justifies further exploration in larger-scale pre-clinical and clinical dose-escalating studies to establish safe and effective dose ranges in conjunction with treatment planning software.

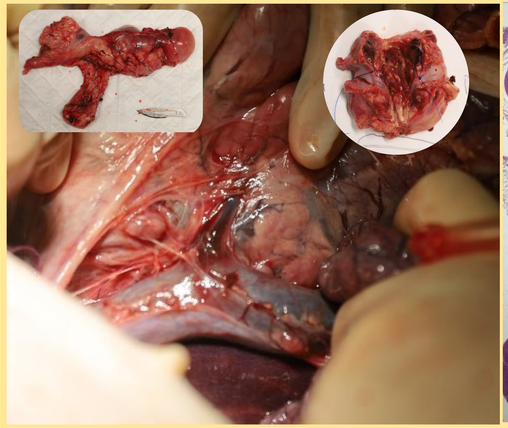
The use of intravascular PDT for pancreatic downstaging therapies is promising.



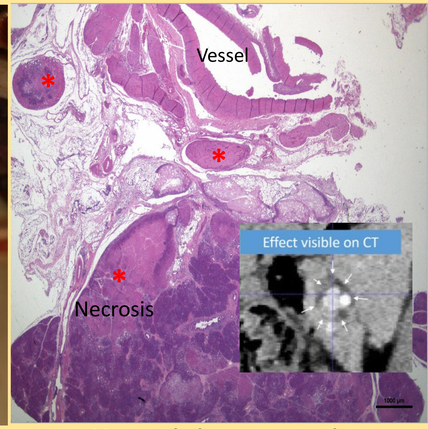
CT-based planning



Light-emitting catheter prototype



Portal & Splenic veins integrity



Necrosis in pancreatic tissue

[1] Narayanan, G. et al. Ablation in Pancreatic Cancer: Past, Present and Future. Cancers 2021, 13, 2511. https://doi.org/10.3390/ cancers13112511