EUS–GUIDED LASER THERMAL ABLATION WITH Nd:YAG LASER ON NORMAL PANCREATIC TISSUE: A PYLOT STUDY IN PORCINE MODEL.

Di Matteo F., Martino M., Rea R., Pandolfi M., Picconi F., Rabitti C.(1), Masselli G.(2), Silvestri S.(2), Costamagna G.(3)

GI Endoscopy Unit, Campus "Bio-Medico" University of Rome
(1) Pathology Unit, Campus "Bio-Medico" University of Rome
(2) Biomedical Engineering, Campus "Bio-Medico" University of Rome
(3) Surgical Endoscopy Unit, Policlinic "A.Gemelli" of Rome

Introduction:
The aim is to determine in vivo feasibility of EUS-guided Laser Thermal Ablation (EUS-LTA) by Neodymium:YAG (Nd:YAG) on normal pancreatic porcine tissue. Secondary endpoints are: efficacy, safety of Nd:YAG EUS-LTA and correlation between real time EUS-image of the ablation area and the extent of the lesion on histological examination. Eight healthy farm swine (4 male and 4 female), weighted 40-50 Kg, are treated with EUS-LTA under general anesthesia, using a transgastric approach. Side effects, complications and clinical changes are evaluated at the end of EUS-LTA till euthanasia.

Summary:
We used an Hitachi EUB 8500 system (Hitachi, Hamburg, Germany) and a linear–array Pentax EG3830UT echoendoscope (Pentax Precision Instruments, Hamburg, Germany). Once the 19G needle (Wilson-Cook Medical Inc., Winston-Salem, N.C.) was pushed into the target, a 300 μm diameter quartz optical fiber tip for a 1.064-nm Nd:YAG laser (ELESTA, Electronic Engineering, Florence, Italy) was inserted to provide a direct contact with the tissue. We applied a continuous output power of 2, 3, 5, and 7 W, to obtain energy delivery of maximum 1000 J per fiber each treatment. At 24 hours animals were sedated, then euthanized by intravenous injection of pento-barbital (100mg/Kg). Tissue ablation was well-defined histologically, and its area related to laser irradiation parameters (range, 0–114.6mm^2). No correlation was found between EUS images and the actual extent of laser-induced lesions.

Conclusions:
All the animals survived at 24h after the EUS-LTA, no major complications were recorded. The EUS-LTA induces well-defined tissue ablation correlated with energy parameters in normal pancreatic porcine tissue.