ANGIOGENESIS EVALUATION IN LOCALLY ADVANCED COLO-RECTAL AND GASTRIC CANCERS BY PROBE-BASED CONFOCAL LASER ENDOMICROSCOPY (pCLE)

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Background and Aim

Probe-based Confocal Laser Endomicroscopy (pCLE) is an innovative endoscopic technique that allows taking high resolution images of the mucosa, facilitating the identification of cellular and subcellular microstructures permitting an evaluation of the microvasculature during endoscopic examination. Angiogenesis is a hallmark of cancer development inducing the formation of new vasculature to support its growth. The aim of our study was to evaluate tumor neoangiogenesis through pCLE imaging in locally advanced gastric and rectal cancer patients, before and after neoadjuvant radio-chemotherapy (RT/CT).

Materials and Methods

72 consecutive patients affected by Rectal Cancer (RC, 18F, 54M mean age: 65 years) and 26 consecutive patients with Gastric Cancer (GC, 6F, 20 M mean age: 64 years) underwent endoscopy with pCLE-GastroFlex UHD probe (Mauna Kea Technologies) and i.v. fluorescein infusion in order to evaluate intratumoral vascularization and to evaluate the efficiency of blood flow. After RT/CT treatment, 33 RC (27M, 6F) and 7 GC (2F, 5M) patients were revaluated using pCLE; neoangiogenesis was evaluated according to Cannizzaro-Spessotto (CS) scale (Fig.1), assigning one point to each of the following features: tortuous vessels, large vessels, leakage and defective flux.

Cannizzaro-Spessotto (C-S) score		
CRITERION	**NO**	**YES**
Tortuous vessels	0	1
Large vessels	0	1
Leakage	0	1
Defective Flux	0	1

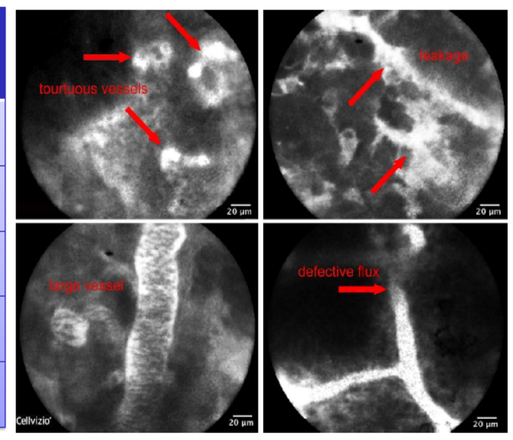

Fig. 1: Cannizzaro-Spessotto scale for angiogenesis evaluation

Results

The difference in median RC (2.74) C-S score and GC (2.30) C-S score is statistically significant p<0.001 (Student's test) (Fig. 2).
There was a significant difference (p<0.01) in neoangiogenesis CS scores between RC pre- (median CS score: 2.7) and post-RT/CT (median CS score: 1.6), while there's not difference (p>0.05) between GC patients pre- (median CS score: 2.6) and post-therapy (median CS score: 2.0) (Fig.3).

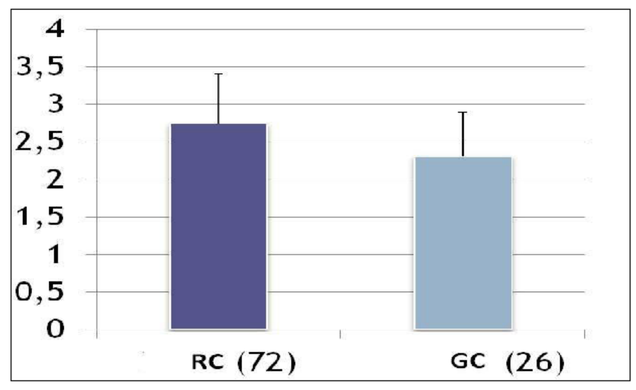

Fig. 2: The difference in median RC and GC C-S score

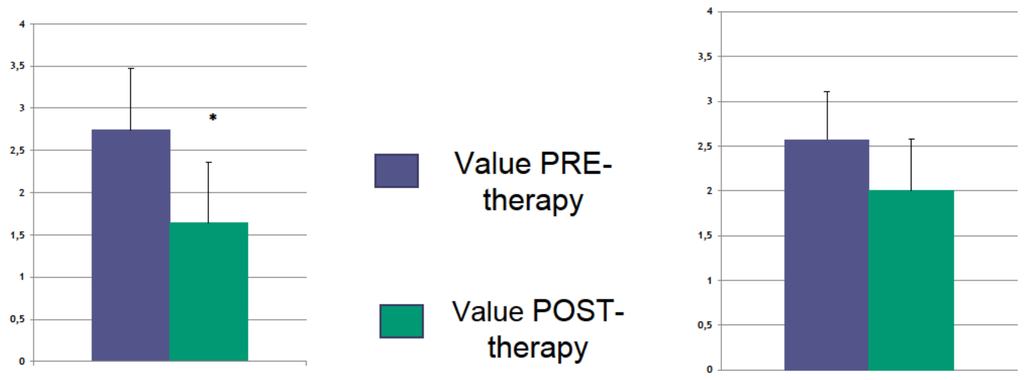

Fig. 3: The difference in median RC (A) and GC (B) C-S score before and after CT-RT

Conclusions

Our data show a better reactivation of vessels' morphology and functions in RC patients, with an improvement of angiogenesis index. In GC patients median angiogenesis index remained unmodified, without positive changes in vascular morphology, probably due to the presence of fibrosis. The results of our work demonstrate that pCLE technique is suitable to evaluate the alterations of the intratumoral microvasculature and reveal a functional improvement of vasculature in post-therapy RC patients. It may constitute a innovative approach in order to identify subjects that respond to the therapy, improving the outcome of the patients.

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