**52. Deep Learning to Measure the Intensity of Indocyanine Green in Endometriosis Surgeries with Intestinal Resection**

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J Pers Med. 2022 Jun 16;12(6):982.doi: 10.3390/jpm12060982.

**Abstract**

Endometriosis is a gynecological pathology that affects between 6 and 15% of women of childbearing age. One of the manifestations is intestinal deep infiltrating endometriosis. This condition may force patients to resort to surgical treatment, often ending in resection. The level of blood perfusion at the anastomosis is crucial for its outcome, for this reason, indocyanine green (ICG), a fluorochrome that green stains the structures where it is present, is injected during surgery. This study proposes a novel method based on deep learning algorithms for quantifying the level of blood perfusion in anastomosis. Firstly, with a deep learning algorithm based on the U-Net, models capable of automatically segmenting the intestine from the surgical videos were generated. Secondly, blood perfusion level, from the already segmented video frames, was quantified. The frames were characterized using textures, precisely nine first- and second-order statistics, and then two experiments were carried out. In the first experiment, the differences in the perfusion between the two- anastomosis parts were determined, and in the second, it was verified that the ICG variation could be captured through the textures. The best model when segmenting has an accuracy of 0.92 and a dice coefficient of 0.96. It is concluded that segmentation of the bowel using the U-Net was successful, and the textures are appropriate descriptors for characterization of the blood perfusion in the images where ICG is present. This might help to predict whether postoperative complications will occur during surgery, enabling clinicians to act on this information.

**Keywords:** automatic segmentation; bowel resection; deep endometriosis; deep learning; laparoscopy; video protocol.