

# **The Relationship Between Wound Complications Following Breast Reconstruction and Fluorescence Ratio of Indocyanine Green Angiography**

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**Introduction:** Wound complications, including skin necrosis, are a dreaded outcome of breast reconstruction and can be reduced by adequate perfusion of the flap. The technology developed to assess tissue perfusion includes the use of indocyanine-green (ICG) and laser-assisted fluorescence angiography (SPY<sup>®</sup>, Novadaq). The use of SPY<sup>®</sup> intraoperatively aids in identifying tissue areas that are at higher risk for developing necrosis.

**Objective:** To determine if there is an association between tissue perfusion assessment from SPY<sup>®</sup> and the clinical outcomes of flap complications.

**Methods:** This study was a retrospective chart review of all adult females undergoing immediate breast reconstruction in which SPY<sup>®</sup> was used intraoperatively from 1/1/2018 – 1/1/201. Data on the number of reoperations and any postoperative wound complications were collected. Major wound complications were defined as a return to the operating room for debridement or wound revision. Percent perfusion values were collected at various places on the flap: the perfusion at margin (PAM), the lowest percent perfusion (LPP), the highest percent perfusion (HPP), and the average percent perfusion (APP). Data were analyzed with Student's t-test, Pearson's correlation, and receiver operating characteristic (ROC) curves.

**Results:** There were 58 patients with one breast image studied per patient. A total of 15/58 (25.9%) breast reconstructions resulted in a major wound complication. All perfusion scores except HPP were lower in breasts developing a major wound complication than in those without complication ( $p < 0.05$ ). From ROC analysis for a major wound complication, a cut-off LPP score of 22.5% and above showed a sensitivity of 80%; specificity 65.1%; positive predictive value (PPV) 44.4%; negative predictive value (NPV) 90.3%. A PAM of 33.5% and above showed a sensitivity of 53.3%; specificity 76.7%; PPV 44.4%; NPV 82.5%. The LPP and APP were negatively correlated with the number of reoperations ( $p < 0.05$ ).

**Conclusion:** Our study identified percent perfusion cut-off values which have a high NPV for major wound complications in patients undergoing breast reconstruction.