

Laser Angiography as a Predictor of Mastectomy Flap Necrosis After Breast Reconstruction

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Background: Skin sparing mastectomy improves the aesthetic result of the reconstructed breast while broadening the reconstructive options. However, areas of ischemia leading to necrosis can prove difficult to clinically assess. We review our experience with laser angiography as a predictor of mastectomy skin flap necrosis. (1-5)

Methods: All mastectomy flaps in patients undergoing immediate breast reconstruction over a two year period were studied. The vascularity of each flap was assessed clinically and simultaneous intraoperative images were obtained using infrared fluorescent tissue angiography (Novadaq SPY SP2001, Mississauga, Ontario) with ICG (Akorn, Buffalo Grove, IL). Postoperatively, the amount of fluorescence (fluorescence level (FL)) throughout each image was calculated (SPY-Q, Novadaq), with relative percentages of fluorescent brightness noted when compared to the most well perfused area of each respective flap (or brightest, regarded as 100%). The fluorescent images and respective postoperative photographs were then compared and areas of ischemic necrosis were correlated.

Results: 227 mastectomy flaps in 174 patients were studied. Poorly perfused mastectomy flap skin, as determined clinically, was resected. However, mastectomy flap necrosis occurred in 10 breasts (4.41%). Four of the 10 (40%) developed full thickness necrosis requiring debridement while the remaining six breasts (60%) developed partial thickness necrosis and healed with conservative care. However, all areas of necrosis displayed a FL of 18% or less (positive predictive value 100%). All reconstructions were salvaged using the original procedure.

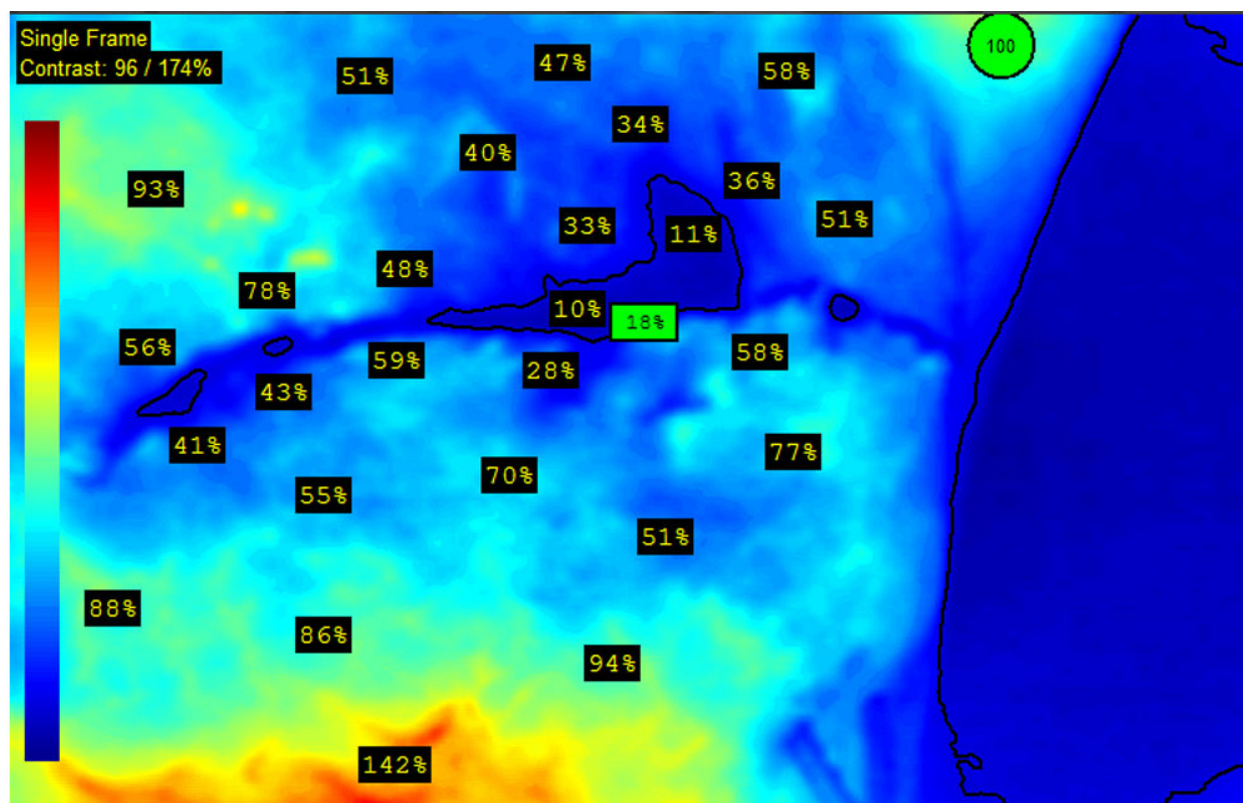


Figure 1. Intraoperative laser image of left mastectomy flaps showing areas with a FL less than 18% (blue circled islands)

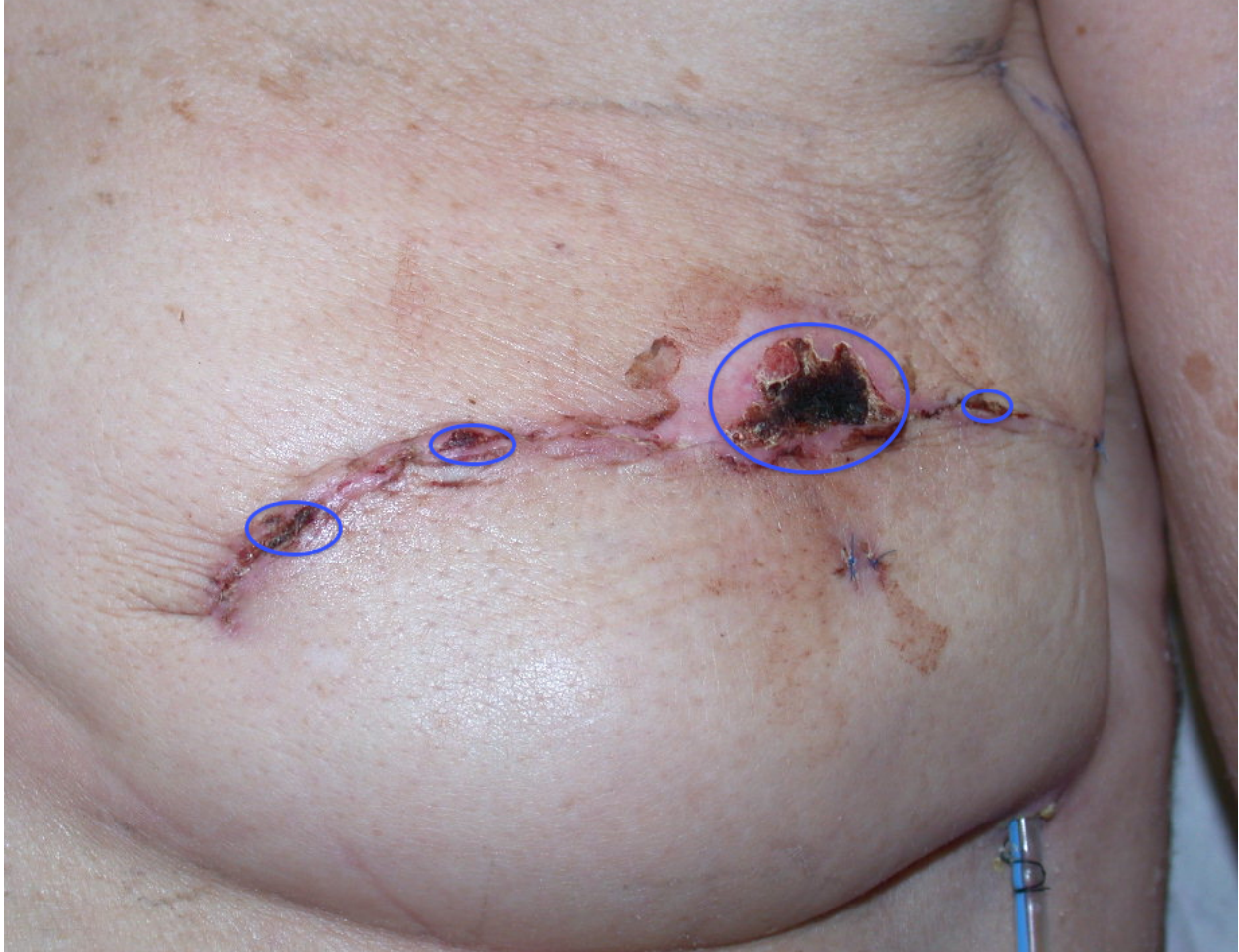


Figure 2. Postoperative necrosis correlating to Figure 1.

Conclusions: A FL greater than 18% always predicted uneventful mastectomy skin flap survival. However, a FL less than 18% predicted partial or full thickness skin flap necrosis.

References

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