FACING THE KEY COMPLICATION OF PRECTORAL RECONSTRUCTION: AN INTEGRATED IMAGING APPROACH TO PREDICT MASTECTOMY SKIN FLAP NECROSIS

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AIMS

This study aimed to evaluate the predictive value of an integrated imaging approach—including preoperative mammography, pre- and post-mastectomy indocyanine green (ICG) angiography, Flap Thickness Ratio, and thermography—in assessing the risk of mastectomy skin flap necrosis in prepectoral breast reconstruction.

METHODS

We conducted a retrospective analysis of patients who underwent prepectoral breast reconstruction between 2022 and 2025 at a single institution (Mater Olbia Hospital). A total of 160 consecutive patients who underwent conservative mastectomy with prepectoral implant-based reconstruction were included: 80 patients were managed using the integrated imaging protocol, and 80 were evaluated intraoperatively based solely on mastectomy flap thickness.

Preoperative mammography was used to measure the breast envelope thickness according to the Rancati modified score (mediolateral and craniocaudal views). ICG angiography was performed before mastectomy to identify breast envelope angiosomes and repeated after mastectomy to assess flap perfusion. The flap thickness ratio was calculated by comparing intraoperative flap thickness with mammographic envelope thickness. Postoperative thermography was performed at 24 hours.
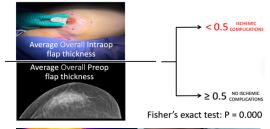

FLAP THICKNESS RATIO

Postoperative mastectomy skin flap necrosis (classified using the SKIN score, Mayo Clinic Classification) and implant exposure data were analyzed.
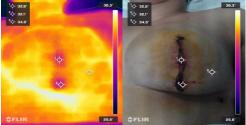
RESULTS

The rates of full-thickness necrosis and implant exposure were lower in patients managed with the integrated imaging approach. The addition of thermography further reduced the incidence of explantation.

CONCLUSIONS

Although ICG angiography remains the most reliable standalone technique for predicting mastectomy skin flap necrosis, the integrated imaging approach enhances predictive accuracy and optimizes reconstructive outcomes by reducing the risk of prosthetic exposure and implant loss.

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