

CASE STUDY

Comparing S_tO_2 and thermography images in bilateral skin sparing mastectomy with immediate DTI reconstruction

Alternative methods in supporting real-time informed decision making.

CASE HISTORY

A 41-year old non-smoking female, with no comorbidities and no family history of breast cancer, with negative genetic testing, was diagnosed with stage 1B cT2N0M0 Grade 2 invasive ductal carcinoma in the right breast. She underwent bilateral skin-sparing mastectomies (the left breast mastectomy was prophylactic) with immediate pre-pectoral direct-to-implant (DTI) reconstruction with Natrelle SSF 450mL SoftTouch gel implants and AlloDerm. Thermography and tissue oxygen saturation (S_tO_2) images were captured at five time-points: pre-mastectomy, post-mastectomy, immediate post-reconstruction, 1-hour post-reconstruction, and 1-day post-reconstruction.

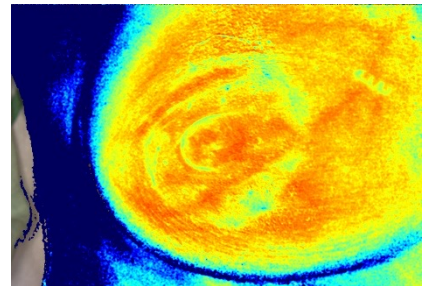
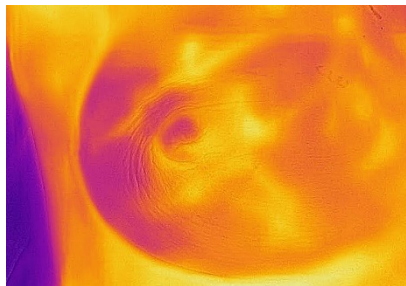


Fig. 1: Pre-mastectomy

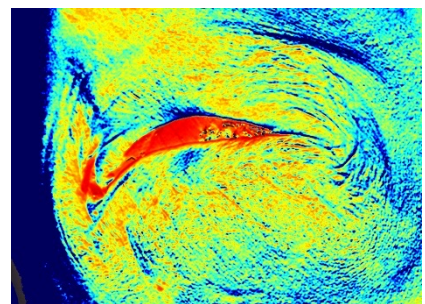
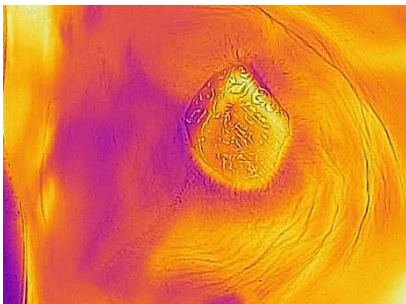


Fig. 2: Post-mastectomy

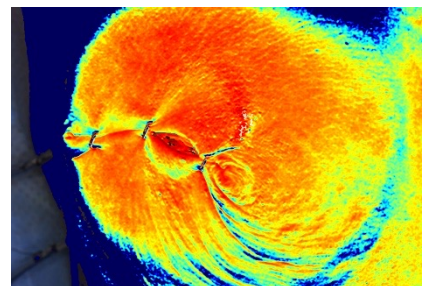
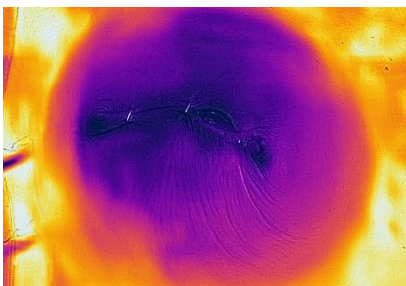


Fig. 3: Immediately Post-reconstruction

Dr. Glyn Jones, MD

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Images show a comparison of FLIR thermography images (LEFT) vs. Snapshot_{NIR} S_tO_2 images (RIGHT) captured at the same time points.

“

The Snapshot_{NIR} is a real gamechanger. It's taking improving outcomes and reducing complications in patients to new levels in reconstructive surgery. At the 30-day follow-up, this patient had peace of mind that she was healing with no complications.”

Dr. Glyn Jones, MD

OBSERVATION

The homogenous tissue oxygenation saturation at the post-reconstruction time point in both breasts was similar to pre-mastectomy values, suggesting that the implants were not exerting too much pressure on the skin, which could cause reduced blood flow/oxygenation. This indicated that the tissue was receiving the nutrients it needed to remain viable.

The thermography images showed a drop in temperature within the breast from pre-mastectomy to post-mastectomy to post-reconstruction. As there is a correlation between temperature and blood flow, this reduction in temperature would suggest that there was limited blood flow by the end of the surgery and that these breasts may have issue with respect to flap survival. Although the temperature has a correlation to blood flow, the data is highly susceptible to ambient temperature which in an operative setting makes it very difficult to rely on for clinical decision making. The Snapshot_{NIR} S_tO₂ images, on the other hand, showed that blood flow and oxygenation were in fact sufficient.

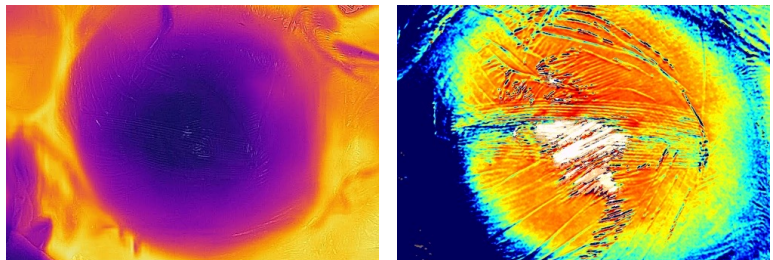


Fig 4: 1-hour post-reconstruction

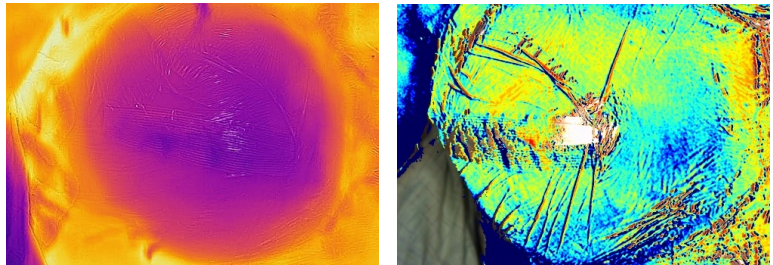


Fig 5: 1-day post-reconstruction

Images cont'd. Images show a comparison of FLIR thermography images (LEFT) vs. Snapshot_{NIR} S_tO₂ images (RIGHT) captured at the same time points.

FINDINGS

S_tO₂ images captured through near-infrared spectroscopy (Snapshot_{NIR}) showed the flaps to be well oxygenated and viable, whereas the FLIR thermography images showed an area of potential concern. Snapshot_{NIR} matched clinical judgment and the surgeon chose to proceed immediately with the planned DTI procedure. The mastectomy flap survived post-operatively and completed healing without complication.