

Thermal Imaging for detecting the response to radiotherapy (Ramot)

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Portable add-on device and method for monitoring drug response and early warning of lesions in high-risk population

Technology

A simple, portable and non-ionizing thermal imaging device for quick early warning of breast lesions, as well as for monitoring response to anti-cancer treatment regime. The infrared technology is capable to detect increase in blood vessel circulation and metabolic changes associated with tumor neo-angiogenesis.

The Need

Breast cancer is the most common type of cancer in women affecting 1:7.5 (lifetime).

Screening for breast cancer has led to early detection and higher cure rate.

Mammogram for women are well established and recommended US in conjunction with mammogram for dense breasts, and MRI for high risk population. However, these techniques suffer from several limitations:

- Ionizing radiation
- Painful
- repeated only yearly or bi-yearly (interval cancer)
- Dense breasts: specificity and the sensitivity is low
- MRI expensive, not freely available

Potential Application

1. Evaluation and early detection of cancer lesions treatment response for chemotherapy (i.e. neo-adjuvant chemotherapy), immunotherapy (known delayed clinical response, very expensive treatment), radiation treatment (adding chemotherapy or changing treatment scheme)
2. Early warning for breast lesions, De-novo diagnosis for healthy women.

Stage of Development


Six stage-IV breast cancer patients and 9 who underwent tumor resection were monitored by a thermal camera during radiation therapy, over several weeks. The thermal images were analyzed, the maximal overtime breast tissue temperature were calculated.

For patients with active tumors, the images of the breast obtained during radiotherapy treatment were processed by an algorithm that highlights tumor and blood vessels with malignancy properties.

Patents

PCT/IL2017/050717 for MONITORING TISSUE TREATMENT USING THERMOGRAPHY was filed June 2017.

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