Northwell
North Shore
University Hospital

Defining Trombley Brennan-Terminal Tissue Injuries with Long Wave Infrared Thermography

Mary R Brennan, RN MBA CWON,Lily Thomas PhD RN, Deanna Vargo,

MAGNET RECOGNIZED
AMERICAN NURSES CREDENTIALING CENTER

Background

Deep Tissue Pressure Injuries (DTPIs) and Trombley Brennan-Terminal Tissue Injury (TB-TTI) resemble one another visually. DTPIs are considered pressure injuries while studies have shown that TB-TTIs are end of life wounds.

Objective

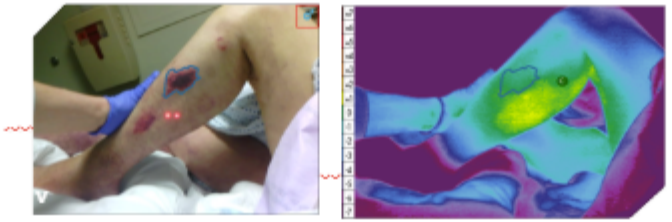
To determine if Long Wave Infrared Thermography can identify a unique thermal image for TB-TTI and to distinguish its thermal characteristics from a DTPI.

Methods

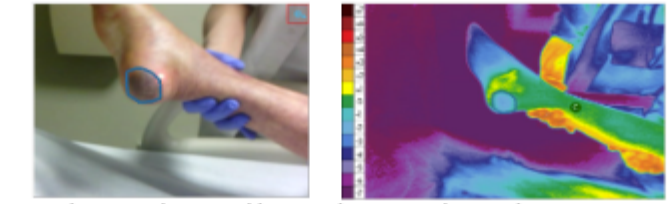
A prospective observational study was conducted in a 10 bed palliative care unit of a quaternary/tertiary hospital. Patients aged 18 years and older, newly presenting with skin changes consistent with a DTPI or a TB-TTI and without pre-existing PIs were eligible.

Results

After adjusting for age and gender, significant differences were found between DTPI and TB-TTI in mean (-2.07 vs. -0.21, p<0.0001), maximum (-1.77 vs. 0.52, p= 0.0434) and minimum (-1.85 vs 0.22, p= 0.0049) discolored tissue temperatures. TB-TTI wounds had a significantly higher percentage of area within _+1degree of normal skin temperature (89.16% vs. 54.94%, p = 0.0011). No significant differences were observed in wound size or perimeter.



Left lateral calf showing purple and red discoloration, thermal showing the trace area with a mean temperature of -0.3 and no demarcation



PI, Right posterior heel. Visible showing purple discoloration; thermal showing the trace area of demarcation with a mean temperature (cool)of -1.5 and a min temperature of -2.6. (Cool = injury)

Conclusions

LWIT successfully identified a distinct thermal profile for TB-TTI, differentiating it from DTPI. These findings support the use of LWIT as a non-invasive, objective tool for accurate identification of TB-TTI, particularly in patients with darker skin tones. This method would be invaluable for nurses in differentiating TB-TTIs from DTPIS and enabling them to: a) confidently recognize TB-TTIs as a prognosticator of death, allowing clinicians to better prepare themselves, patients, and families for the dying process and b) implement early interventions preventing complications of DTPIs. The findings from this study provide an equitable method for assessing all skin tones, early detection of DTPIs, accurate classification of TB-TTIs, and informs practice and policy for the care of end-of-life patients.

References