

STUDY REPORT



Influence Trial

Indocyanine green Node FLUorEsceNCE

A prospective randomized multicenter study comparing **indocyanine green (ICG)** fluorescence combined with a standard tracer versus **ICG alone** for sentinel lymph node (SLN) detection in early breast cancer



Introduction

INFLUENCE was a prospective observational study comparing indocyanine green (ICG) fluorescence combined with a standard tracer versus ICG alone for sentinel lymph (SLN) detection in early breast cancer.

The primary objective of this study is to determine the sensitivity of ICG fluorescence imaging alone for SLN identification compared with a combination of ICG and a standard tracer (either blue dye or radioisotope).

Objectives and methods

100 patients with unilateral clinically node negative tumours scheduled to undergo routine SNB for core-biopsy proven invasive breast cancer ($\leq 5\text{cm}$) were identified at multidisciplinary meetings [non-invasive tumours excluded]. All patients had pre-operative axillary ultrasound and breast conserving surgery or mastectomy. Patients were recruited in two cohorts ($n=50$); cohort 1 was assigned to either ICG [2ml 0.5%] alone ($n=25$) or combined with RI [Technetium⁹⁹ nanocolloid, 20MBq] ($n=25$). Cohort 2 received ICG alone ($n=25$) or combined with blue dye for SNB localization. The number of nodes whether blue, radioactive, fluorescent or a combination thereof were recorded. Lymphatic and nodal tissue was visualized with a fluorescent camera/detection system. Sensitivity of ICG alone and/or in combination with one or another standard tracer was calculated.

The main objective was to assess the performance of ICG alone compared with a standard tracer combination in terms of rates of SNB identification along with

procedural node positivity rates. Statistical analysis employed Chi-Square test, Fisher's Exact test, and logistic regression to determine differences between groups

Outcomes

The study has achieved its objectives.

A total of 100 patients were randomized between March and December 2022 with 3 patients excluded from analysis (non-receipt of treatment allocation). Amongst evaluable patients (n=97), the overall SNB identification rate was 96.9% and by tracer category as follows: ICG alone = 97.9% (46/47); ICG + RI = 100% (25/25); ICG + blue dye = 92% (23/25). For cohort 1, the procedural node positivity rates were 17% for ICG alone and 18% for ICG + RI with corresponding figures of 12% for ICG alone and 20% for ICG + blue dye for cohort 2. Mean procedural node retrieval per case was 2.5 in ICG alone Vs ICG + Blue Dye and 2.3 in ICG alone Vs ICG/RI cohorts. There were no significant differences ($p>0.05$) in performance of ICG alone or combined with a standard tracer, with ICG alone being non-inferior in terms of procedural and nodal detection rates. Similar conclusions were reached from a secondary analysis adjusting for BMI, age and mode of detection (screening/symptomatic). ICG fluorescence imaging permits real-time visualisation of lymphatics and gives an additional dimension to SNB that appears safe versus the competitive alternatives. These results confirm high sensitivity for fluorescence localisation alone for SNB with comparable performance to combined methods with blue dye or RI. The fluorochrome ICG is reliable as a sole tracer and avoids potential drawbacks of blue dye and RI including staining, allergic reactions, availability and costs.

Dissemination of Results

The outcomes were presented as a poster in the 2023 San Antonio Breast Cancer symposium in Texas. There will be also an oral presentation in the 2024 ABS (Association of Breast Surgery) meeting in May 2024 in Bournemouth. A patient experience survey is being undertaken separately to the participating patients coupled with dissemination of the results telephonically. A publication is being prepared to be submitted in a peer reviewed journal.

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