

Early implementation and learning curve of robotic-assisted microsurgery for delayed lymphatic reconstruction in breast cancer related lymphedema: A single institution's experience

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INTRODUCTION

- Breast cancer–related lymphedema (BCRL) remains a common, debilitating outcome of axillary node dissection
- Traditional lymphatic reconstruction is effective yet highly technically demanding
- Robotic microsurgery offers:
 - Tremor filtration
 - Enhanced precision
 - Superior 3D visualization
 - Improved ergonomics → potentially better outcomes

Objective

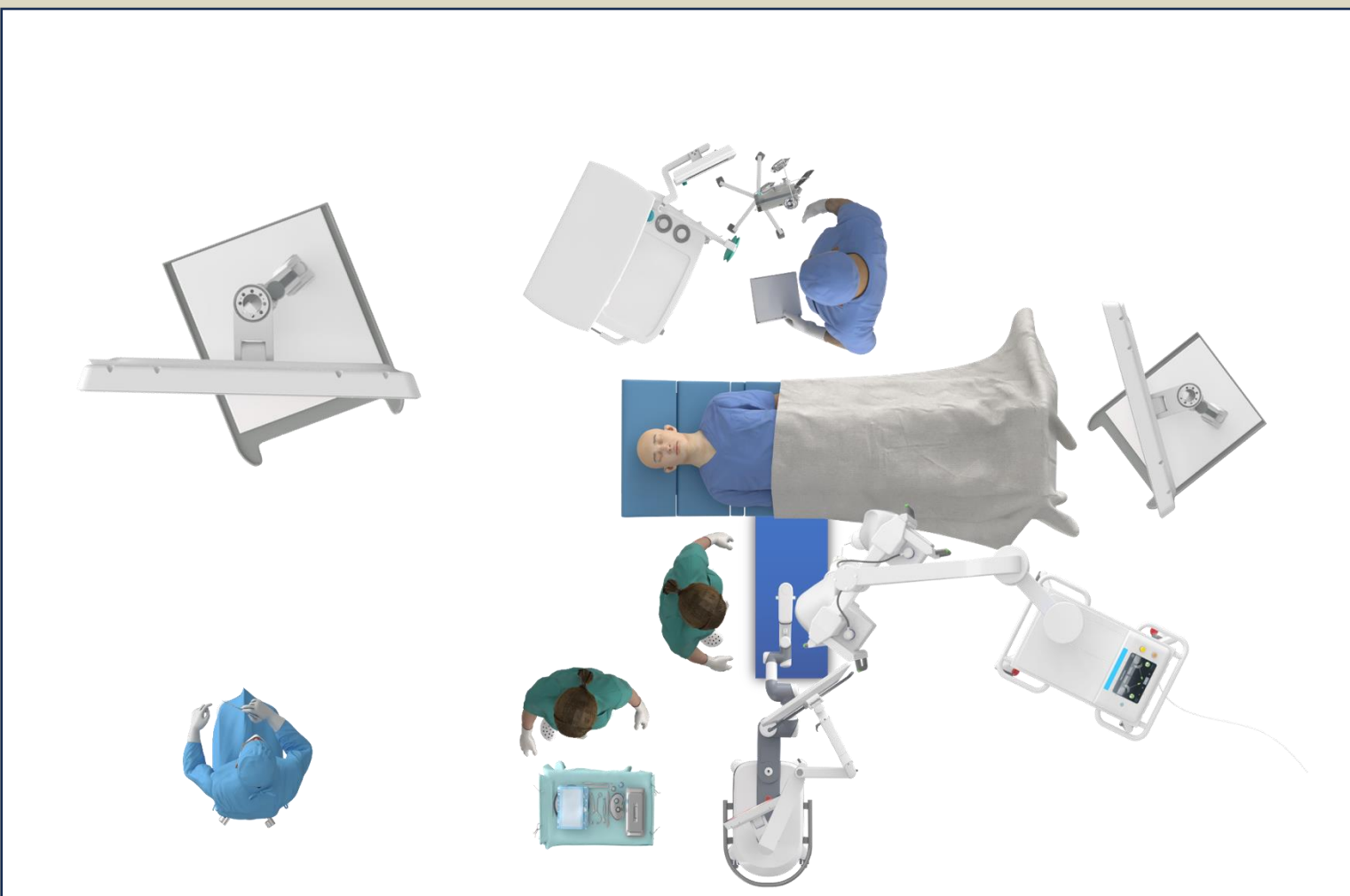
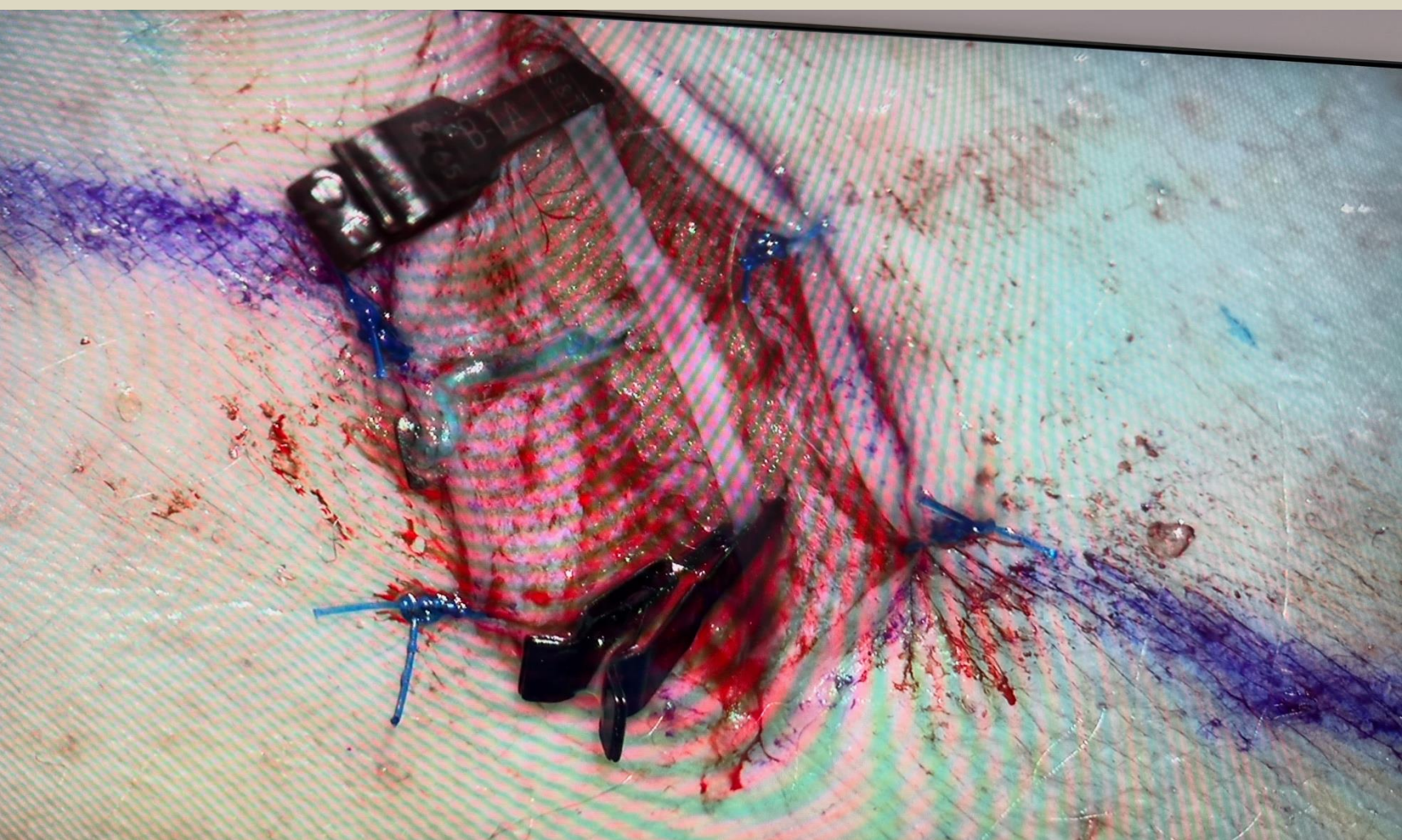
- To evaluate early clinical outcomes and the learning curve of robotic-assisted delayed lymphatic reconstruction for BCRL

METHODS

- Patients with chronic BCRL underwent delayed lymphatic reconstruction using the Symani Surgical System (Medical Microinstruments, Calci, Italy)
- From January to August 2025 with at least 3 months of follow up
- Reverse arm mapping- ICG and isosulfan blue
- Demographic data, operative times, and perioperative outcomes were analyzed
- Learning curve assessment- correlation testing

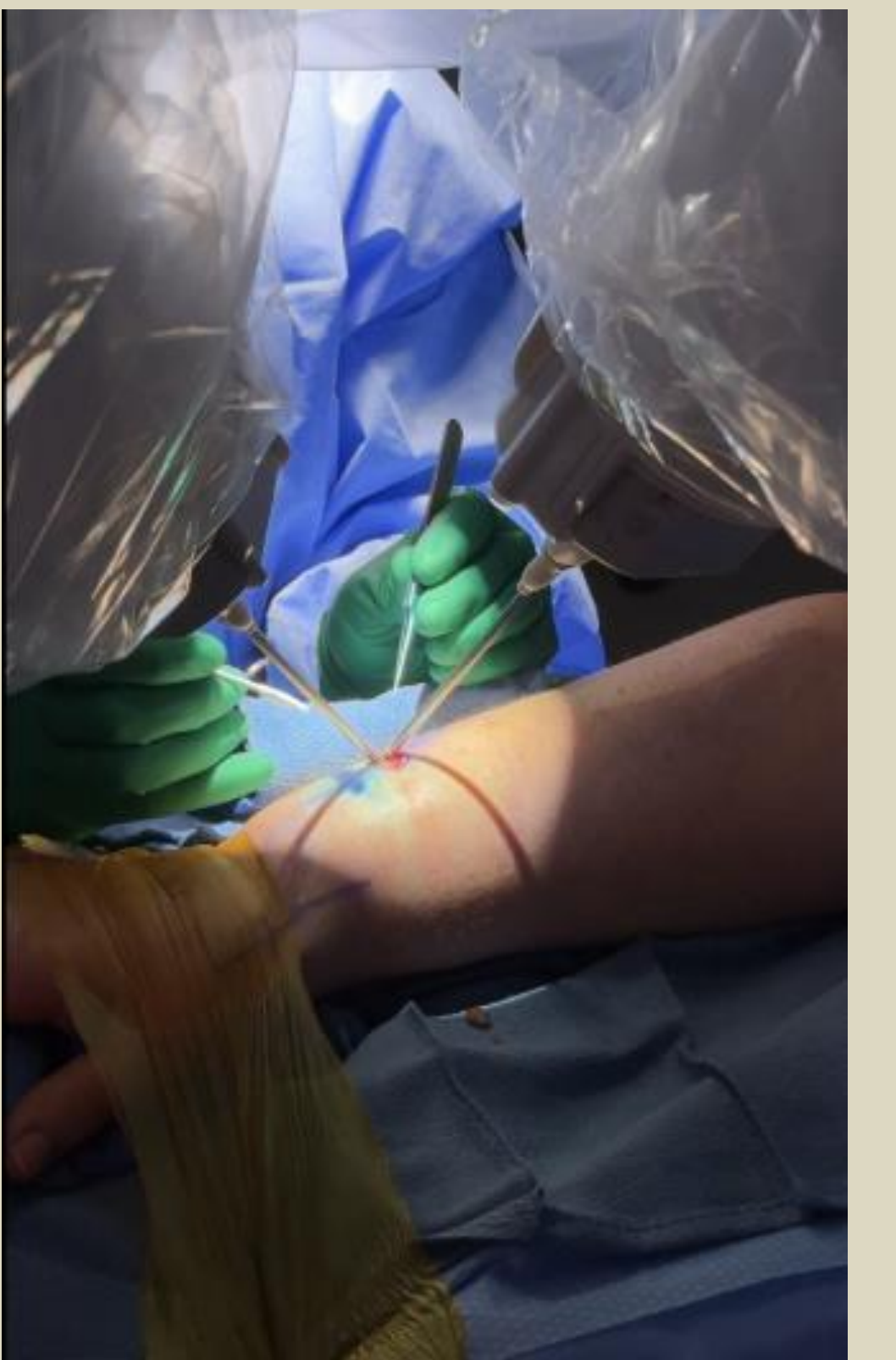
RESULTS

- 29 patients underwent robotic-assisted reconstruction
- 113 lymphaticovenular anastomoses
- Mean patient age was 62 ± 11 years
- Mean BMI was 27 ± 4.1 kg/m²
- Mean operative time was 230.3 ± 63.0 minutes, averaging 71.4 ± 34.9 minutes per anastomosis.
- A learning curve plateau was observed after approximately 20 cases ($p = 0.48$).
- Mean follow-up of 91.6 ± 69.5 days, patients demonstrated early improvements in limb volume and quality of life
- No major complications, including infection, hematoma, seroma, or wound dehiscence.



DISCUSSION

- Robotic-assisted microsurgery for delayed lymphatic reconstruction in BCRL is feasible and safe, with encouraging early outcomes
- Further studies with larger cohorts and longer follow-up are warranted to confirm its long-term efficacy and reproducibility
- Learning curve
 - One size fits all setup
 - OR positioning
 - Technical skills



REFERENCES

- Dvan Mulken TJM, Schols RM, Scharmga AMJ, et al. First-in-human robotic supermicrosurgery using a dedicated microsurgical robot for treating breast cancer-related lymphedema: a randomized pilot trial. *Nat Commun.* Feb 11 2020;11(1):757. doi:10.1038/s41467-019-14188-w