

台灣乳房腫瘤手術暨重建醫學會

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靛氰綠淋巴管造影證實淋巴-同軸度概念可應用於腹直肌皮瓣乳房重建：一種促進淋巴管新生的方法

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Indocyanine green lymphangiography verifies lymph-axiality concept can be applied to transverse rectus abdominus myocutaneous flap breast reconstruction: a method promotes lymphangiogenesis

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Purpose

Breast cancer-related lymphedema(BCRL) in upper extremities is a significant complication following breast surgery with axillary lymph nodes (LNs) dissection. Saaristo described breast reconstruction with LNs transfer had lower rate of BCRL. Tobbia confirmed LNs reimplantation preserves lymphatic function after 8~12 months of LNs excision in animal experiment. In 2018, Yamamoto described lymph-axiality concept that a lymphatic vessels flap can bridge a gap of lymphatic system(if stump \leq 2cm) and achieve lymphatic flow restoration in extremities soft tissue defects without other intervention. Here, we shared 2 cases accepted modified radical mastectomy and transverse rectus abdominus myocutaneous(TRAM) flap reconstruction under lymph-axiality concept with indocyanine green lymphangiography(ICG).

Materials and Methods

First case is a 47 years old female with right breast cancer, pT1aN1aM0. Second case is a 56 years old female suffered from left breast cancer, pT1cN0M0. 2 cases accepted tumor side MRM with LNs dissection and TRAM flap reconstruction. Before operation started, we injected 3cc ICG to tumor side hand and flank side(**Fig.1**). After MRM, we used ICG fluoroscope(HAMAMATSU C10935-400) to check lymphatic flow of tumor side axilla, chest and pelvic, **Fig.2~3**) before breast reconstruction. Once we had the axiality of lymphatic flow, the interposition direction of TRAM flap connects 2 lymphatic systems(axilla to chest and pelvic to TRAM flap) at the same axial.

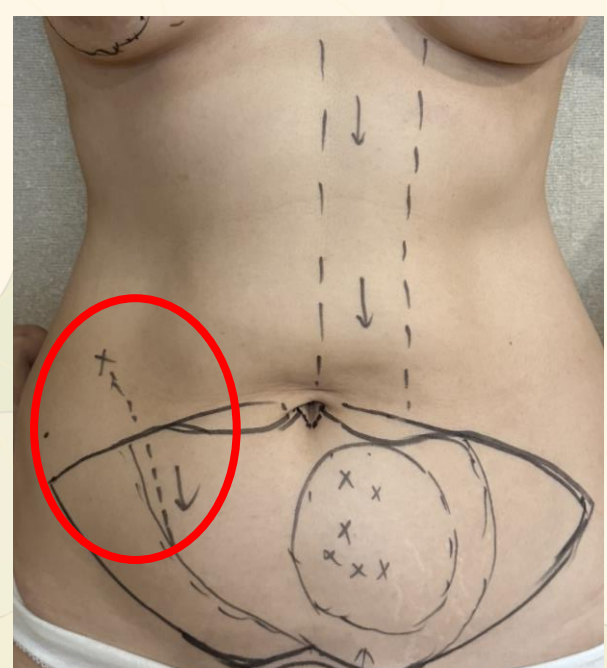


Fig.1 (Case1)Simulation of lymphatic flow in right flank to TRAM flap before operation. 3cc ICG will be injected to "x" mark on operation day in red circle. Dotted line and arrow mean that ICG will run along this route via lymphatic system(pelvic to inguinal lymph nodes)

Results

After 1 month, we injected 3cc ICG to both cases' tumor side hand and performed ICG fluoroscope exam, which showed enhancement signal from tumor side upper arm to breast reconstruction site(**Fig.4**), which explains the successful lymphangiogenesis. Both cases had no flap donor site comorbidities including bleeding or infection.

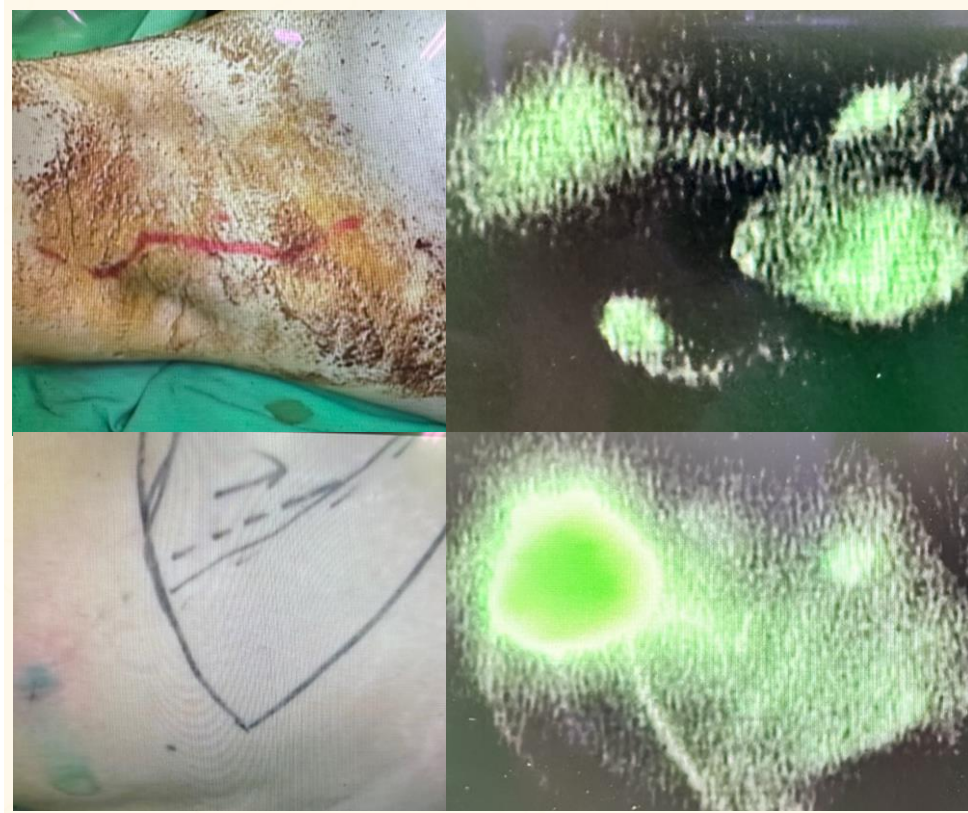


Fig.2 (Case 1)ICG lymphangiography of right axilla to chest(**Upper**) and pelvic to flap donor site(**Lower**) after right MRM. Strong signal means higher concentration of ICG by lymphatic circulation.

Conclusion

Lymph-axiality concept can be applied in breast reconstruction and achieves lymphangiogenesis without LNs transfer or lymphatic vessel anastomosis, and it takes less time compared with previous studyduration (1 mo vs. 8~12 mos). All we need is long-term data.

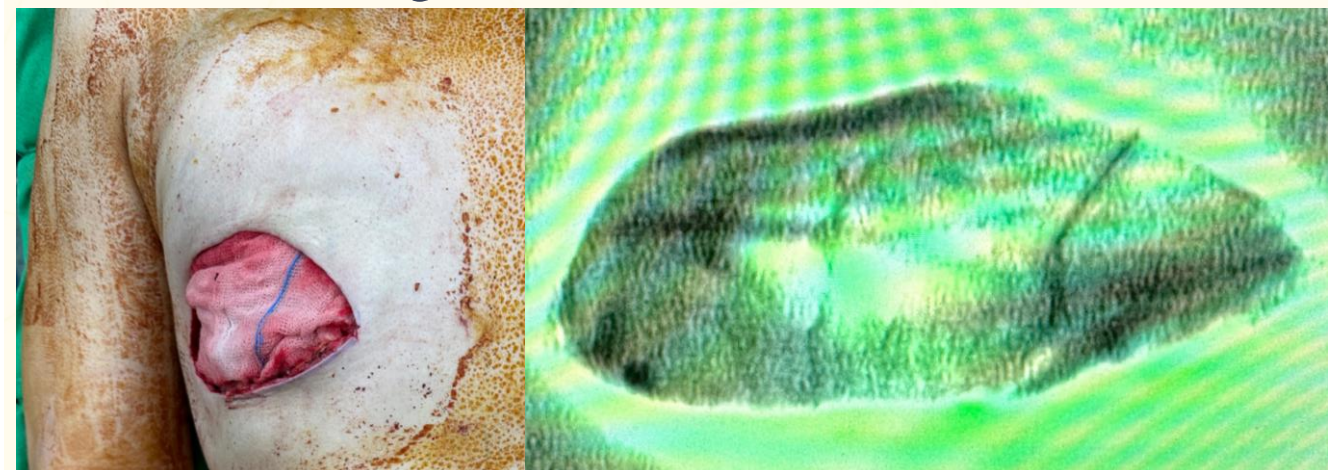


Fig.3 (Case1)after right MRM, ICG lymphangiography showed no enhancement signal over breast tissue removal site, which means lymphatic circulation was destroyed during mastectomy.

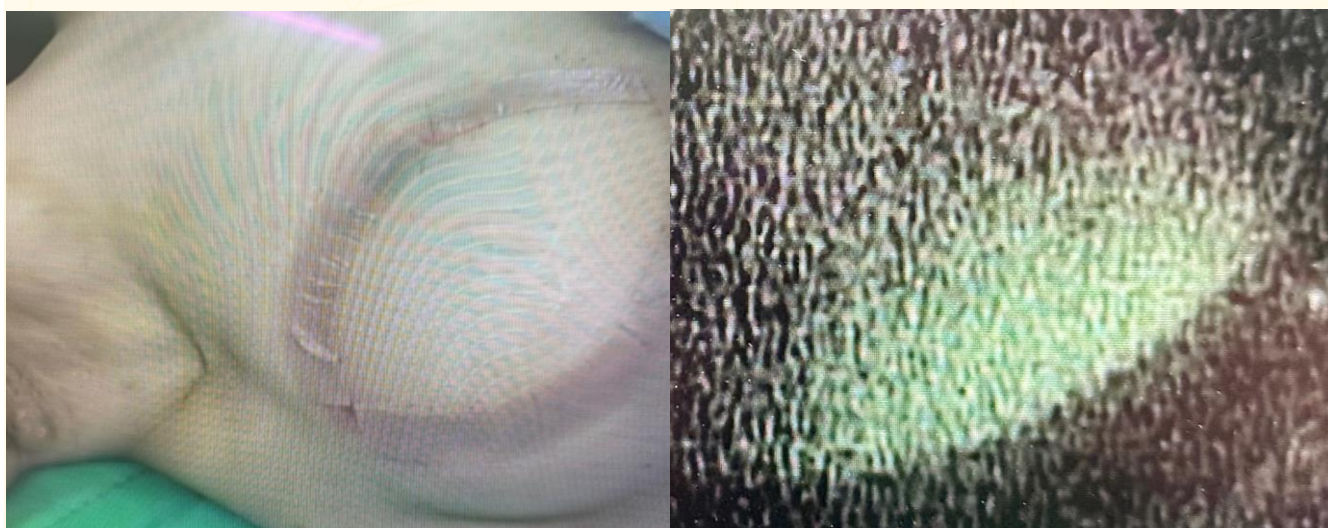


Fig.4 (Case 1)ICG lymphangiography of right axilla to flap area after 1 month showed enhancement signal in breast reconstruction site in both cases, which means successful lymphangiogenesis