



**Dr Somashekhar SP, Dr Rohit, Dr Ashok, Dr Ashwin, Dr Srikant , Dr Archa
Manipal Comprehensive Cancer Centre , Bangalore, INDIA**

- Breast Cancer related lymphedema (BCRL) remains a potentially life-altering sequela of breast cancer treatment that affects approximately one in five patients with a reported incidence varying from 5% to more than 50 %
- Well-established risk factors include ALND, regional lymph node radiation (RLNR), high BMI at time of diagnosis, edema 3–5% within 3 months of surgery, edema 5–10% at any time after surgery, and cellulitis infections.
- Sentinel lymph node (SLN) biopsy has reduced the severity of swelling to nearly 6% patients (from 2 to 7%).
- Axillary reverse mapping (ARM) method developed aiming at identifying and preserving lymphatics draining the arm has also help decreased the incidence of lymphedema.
- Lymphatic Microsurgical Preventive Healing Approach – (LY.M.P.H.A.) is a surgical technique proposed for patients with operable breast cancer requiring an axillary dissection consisting of carrying out lymphatico-venous anastomosis (LVA) between arm lymphatics identified by injecting blue dye or ICG in the arm and an axillary vein branch simultaneously.
- This preventative microsurgical procedure was first described by Boccardo, Campisi et al in 2009.

AIMS:

- To evaluate the feasibility of LYMPHA procedure in our setup.
- To evaluate the efficacy of LYMPHA procedure in preventing lymphedema post ALND

MATERIALS & METHODS:

Study Design: Prospective Observational

Study Place: Manipal Hospital, Bangalore

Number Of Patients: 50

Study Duration: October 2017-December 2019

Inclusion Criteria: Unilateral breast cancer requiring ALND

Exclusion Criteria: Bilateral breast cancer, previous lymphedema, Drug allergy ICG, Not consenting for procedure.



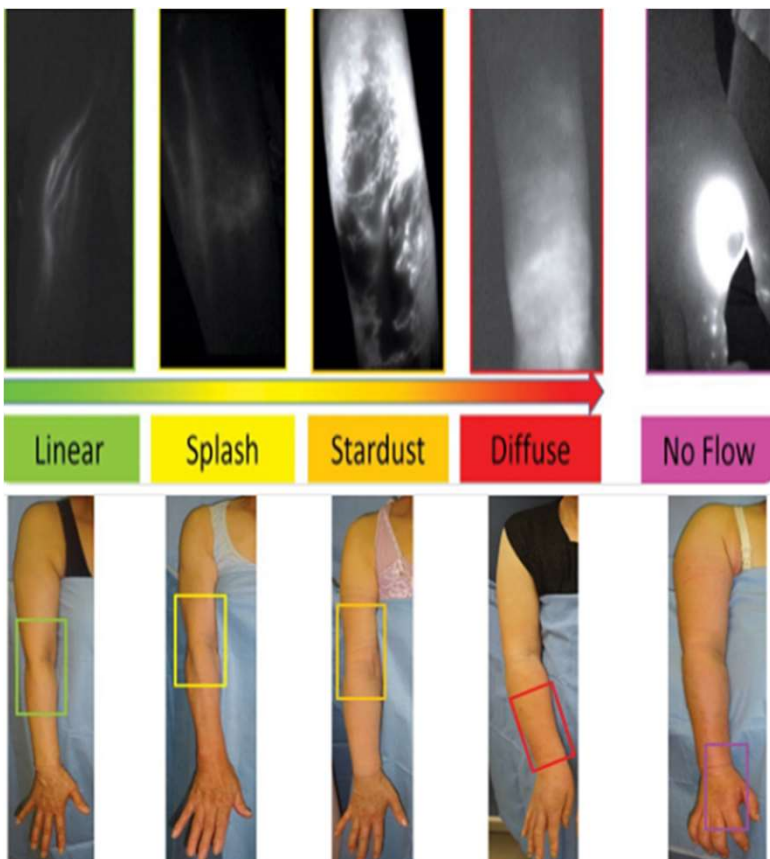
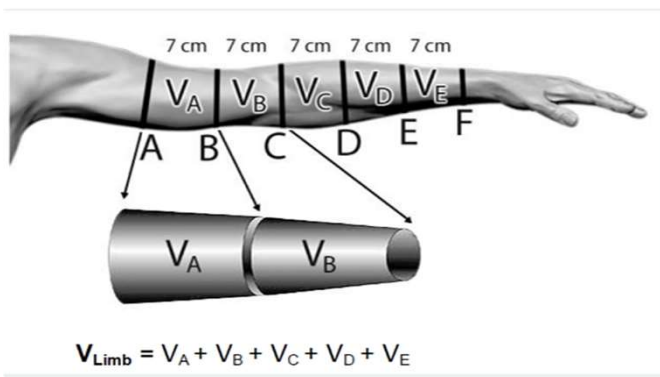
Defining Lymphedema in OUR Study

- Change In volume on subsequent reading of >15% (based on formula for volume of the frustum of a cone)
- More than 3 splashes on the operated arm on ICG lymphography
- Patient reported arm swelling or heaviness during course of treatment & follow up.

Follow-up Protocol

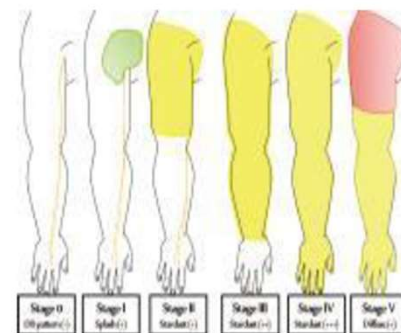
- Baseline Volumetry Pre-op + Intra-op ICG Lymphangiography
- Volumetry assesment + patient reported outcomes at 3, 6 & 12 months
- ICG lymphangiography on 6 & 12 months

$$V = h * (C2 + Cc + c2)/(12 * \pi),$$



Arm Dermal Backflow Stage

Arm dermal backflow (ADB) stage is a classification for lymphedema on an upper extremity.



Stage	Description
0	No dermal backflow pattern
I	Splash pattern around the axilla
II	Stardust pattern limited between the axilla and the olecranon
III	Stardust pattern exceeding the olecranon
IV	Stardust pattern observed throughout the limb
V	Diffuse pattern and stardust pattern observed throughout the limb



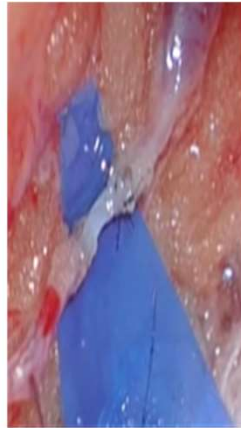
Steps Of LYMPHA Procedure :



Injecting ICG



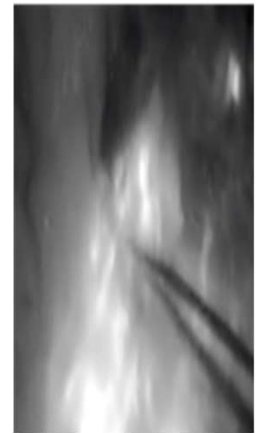
Identifying a cut Lymphatic



End to End Lympho-venular Anastomosis



Invagination Technique



Checking For Patency

	Total , N=50
Age (years)	50.2±9.4 (32-68)
BMI	22±6.2 (18-32)
<25	36
25-30	10
>30	04
Stage	
T1	04
T2	22
T3	08
T4	16
SLNB	8
Total Number of Nodes retrieved	16±7.5 (10-28)
Positive Lymph Nodes	4±5.2 (2-25)
MASTECTOMY/BCS	34/16
NACT : Yes/No	34/16
NAHT : YES/No	8/42
Adjuvant Chemotherapy : Yes/No	50/0
Adjuvant Radiotherapy: Yes/No	50/0



RESULTS :

Able to identify lymphatic vessel	46 (92%)
Reason for Not Performing LYMPHA	
Not able to visualise Lymphatics	2
Extensive disease in axilla	2
No of anastomosis per patient	2.4±1.2
Avg (Range)	(2-5)
Duration of Surgery	42 ± 20.5min
Avg (Range)	(30-60 min)
Technique used For Lympha Procedure	
End to End	30
End to Side	10
Invaginate	06

Parameter	Baseline	3 Months	6 Months	12 Months
Drain Removal days	15±3.4 (10-24)	-	-	-
Volumetry Based Lympe^dema	No	No	No N= 40/46	4 N=38/46
ICG Lymphography	No	Not Done	3 N=40/46	4 N=38/46
Patient reported Outcome	-	4	5	4



DISCUSSION:

- Boccardo et al in their experience with LYMPHA have reported a lymphedema rate of 4% over 4 year follow up in 74 patients .
- In our series with a mean follow up of 20.4±2.8months(8-26) 4 out of 46 patients had lymphedema. (Volumetry & ICG Lymphography)
- As per PRO 5 patients developed heaviness & swelling of which for 1 patients it gradually resolved by 10 months.
- Patency of LVA was well documented at 4 years by boccardo et al, in our series almost all had patent anastomosis at 12 month follow up. (38 patients)
- All the patients in our series received radiotherapy and adjuvant chemotherapy in form of taxanes which has been reported to be one of risk factors for lymphedema.
- Since most of patients had BMI less than 25 we could not assess the risk with obesity , but 2 patients who developed obvious lymphedema had BMI more than 30.
- Most of the reported single center experiences reported were able to get lymphatics vessel and vein for anastomosis in > 90% of patients which was also true with us. (92%)
- Average number of anastomosis is reported in most series is 2.8 (1-5) , which was 2.4 in our series .
- The additional time duration for LVA as been reported to be between 15 minutes to 45 minutes which was also the same with us 42 ± 20.5min (30-60 min)

CONCLUSION:

- LYMPHA is feasible, safe, and practical method for the primary prevention of clinical lymphedema in our setup.
- This technique serves to significantly reduce the rate of clinical LE in breast cancer patients.
- As our experience grows, we anticipate that the majority of patients undergoing ALND would benefit from the LYMPHA procedure.
- There is need for a multidisciplinary approach to diagnose, treat, and prevent BCRL.
- Success necessitates communication and coordination with a patient's medical, surgical, radiation oncologists & plastic surgery team and nurse practitioners as well as with their physical therapists.
- Larger multi-institution and randomized trials are warranted for defining patient selection and looking into long term outcomes of the LYMPHA procedure.

References:

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