Supplementary Information

First-in-human robotic supermicrosurgery using a dedicated microsurgical robot for treating breast cancer-related lymphedema: a randomized pilot trial

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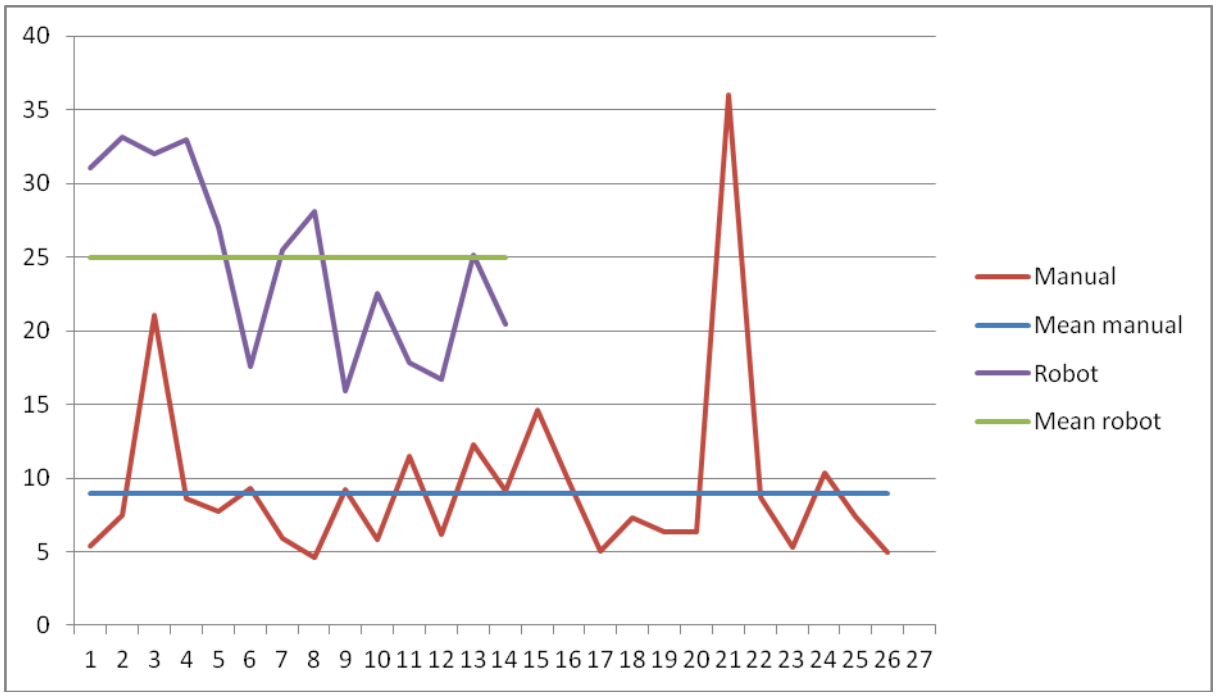
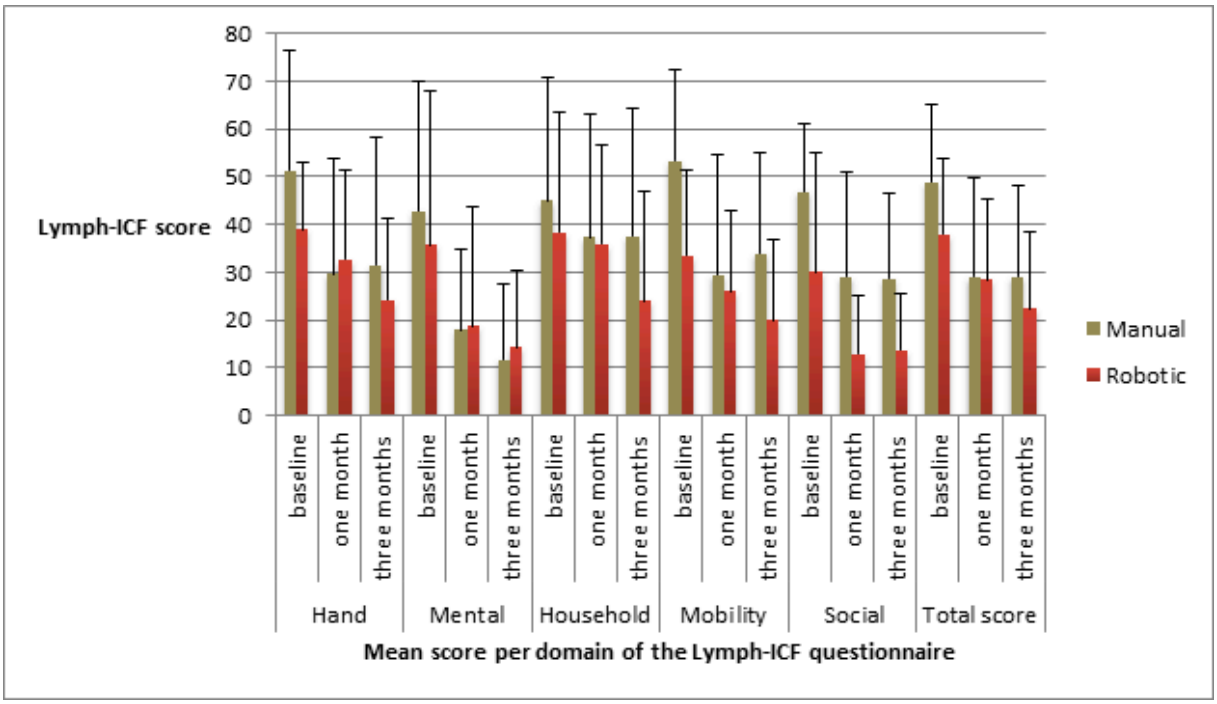
Supplementary Figure 1. Duration of the anastomoses in minutes



Duration of the anastomoses in minutes completed by robot-assistance versus the manual procedure, in consecutive order. Mean duration of respectively manual (n=14) and robotic (n=26) anastomoses are provided in the figure. Source data are provided as a Source Data file.

Supplementary Figure 2. Lymph-ICF scores



Mean lymph-ICF scores per domain and total score for the robotic and manual LVA group at baseline, one month and three months follow-up. Error bars of SD are included. Source data are provided as a Source Data file.

Supplementary Table 1. SAMS and UWOMSA scores of anastomoses performed

	SAMS			UWOMSA		
		robotic (n=14)	manual (n=26)		robotic (n=14)	manual (n=26)
Dexterity	Steadiness	3.2±0.5	3.4±0.5	Preparation	3.5±.0.3	3.9±0.5
	Instrument handling	3.0±0.5	3.8±0.4	Suturing	3.2±0.4	3.9±0.4
	Tissue handling	3.2±0.5	3.8±0.4	Final product	3.4±0.2	4.0±0.5
Visuo-spatial ability	Dissection	3.4±0.6	4.0±0.4			
	Suture placement	3.5±0.5	4.1±0.3			
	Knot technique	3.8±0.5	4.3±0.3			
Operative flow	Steps	3.2±0.5	4.0±0.5			
	Motion	2.9±0.5	3.8±0.5			
	Speed	3.0±0.7	4.0±0.6			
Judgement	Irrigation	4.2±0.6	4.6±0.6			
	Patency test	2.4±1.6	3.8±0.6			
	Bleeding control	2.8±1.1	3.9±0.8			
Overall performance		3.0±0.7	4.0±0.5			
Indicative skill		3.0±0.6	4.0±0.5			

Data shown as average score of two readers

Mean ± SD of SAMS and UWOMSA scores. Source data are provided as a Source Data file.

Supplementary Table 2. Patient comfort and surgeon performance during LVA procedure

Group Statistics

	Surgery: hand or robot	N	Mean	Std. Deviation	Std. Error Mean
Comfort during LVA	hand	12	8,5833	1,10440	0,31881
	robot	8	8,0000	2,00000	0,70711
Performance surgeon during LVA	hand	12	3,75	0,754	0,218
	robot	8	3,13	0,641	0,227

Mean ± SD of patient comfort and surgeon performance during LVA respectively. Source data are provided as a Source Data file.

Supplementary Table 3. Patient comfort and surgeon performance during LVA procedure

Independent Samples Test

				t-test for Equality of Means						
				t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% CI of the Difference	
									Lower	Upper
Comfort during LVA procedure	Equal variances assumed	2,205	0,155	0,843	18	0,411	0,58333	0,69236	-0,87126	2,03792
	Equal variances not assumed			0,752	9,876	0,470	0,58333	0,77566	-1,14789	2,31456
Performance surgeon during LVA procedure	Equal variances assumed	0,230	0,637	1,923	18	0,070	0,625	0,325	-0,058	1,308
	Equal variances not assumed			1,990	16,782	0,063	0,625	0,314	-0,038	1,288

Independent samples test of patient comfort and surgeon performance during LVA respectively. Source data are provided as a Source Data file.

Supplementary Table 4. Patient comfort and surgeon performance during LVA procedure

Statistics

		Comfort during LVA procedure	Performance surgeon during LVA procedure
N	Valid	20	20
	Missing	0	0
Std. Deviation		1,50525	0,761
Range		6,00	3
Minimum		4,00	2
Maximum		10,00	5

Statistics (SD, Range) of patient comfort and surgeon performance during LVA respectively. Source data are provided as a Source Data file.