

Robotic versus Conventional Nipple Sparing Mastectomy and Immediate Prosthesis Breast Reconstruction in the Management of Breast Cancer A Case Control Comparison Study

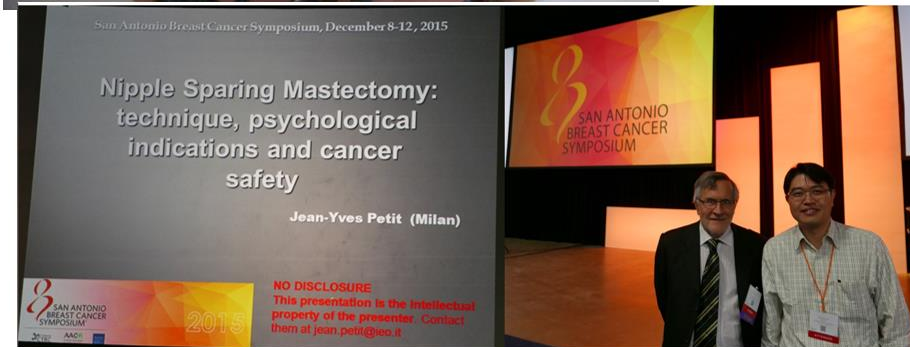
Hung-Wen Lai(賴鴻文), MD, PhD
Director of Endoscopic & Oncoplastic Breast Surgery Center,
Changhua Christian Hospital, Taiwan



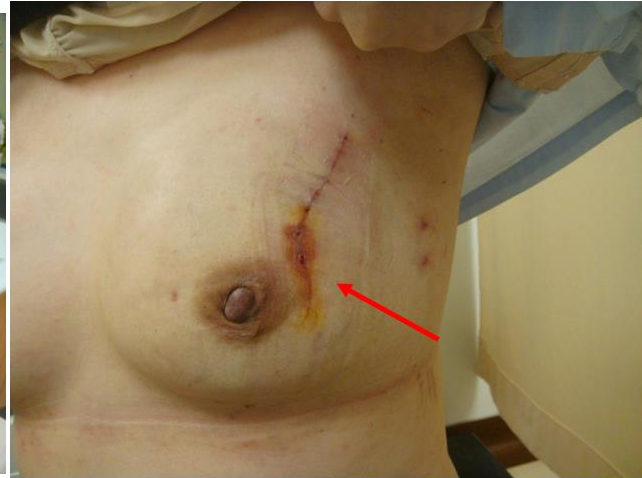
Nipple sparing mastectomy



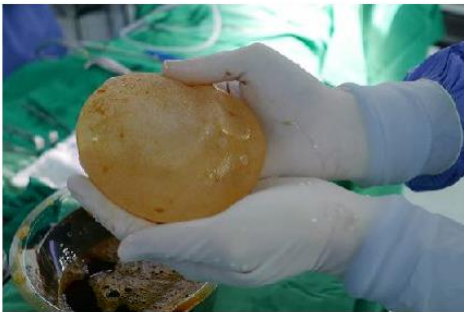
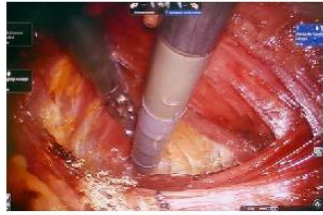
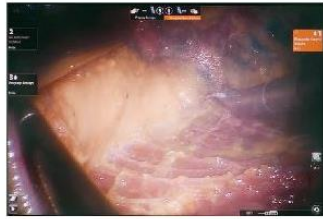
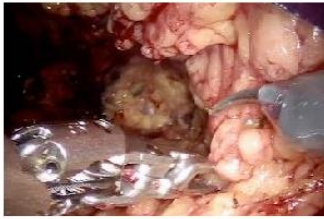
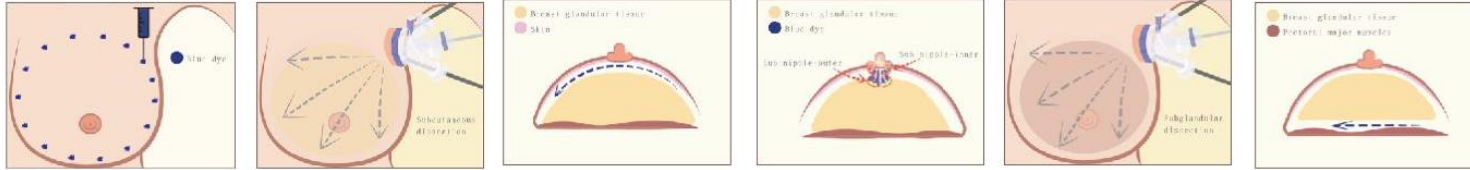
The nipple-areola complex (NAC) invasion rate : **7.7%-58%**.



Prof. Petit, EIO



Long and apparent scar **Avoided?**



Lai HW, et al.
 PRS GO 2018
 Ann Surg Oncol 2018



Pre-OP



Post-OP 3 weeks



Background

- There was a **paucity of evidence** available comparing the **effectiveness and safety** of **Robotic nipple sparing mastectomy (R-NSM)** with **Conventional nipple sparing mastectomy (C-NSM)** in the management of breast cancer.

Methodology

- A **case control comparison study** was conducted for patients who received **C-NSM versus R-NSM** in a single institution
- Comparing
 - ✿ **Clinical outcomes: peri-operative parameters and complication rates**
 - ✿ **Cost**
 - ✿ **Patient-reported cosmetic results**

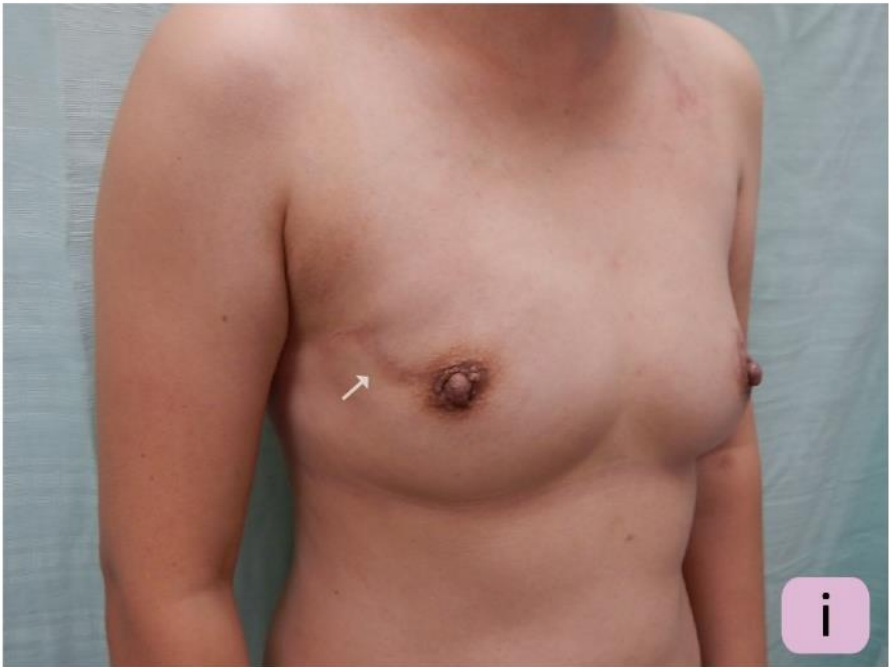
C-NSM



R-NSM







Comparison of C-NSM and R-NSM

- **Peri-operative morbidities** and **oncologic safety** of C-NSM and R-NSM were carefully monitored
- **Surgical margin involvement** was defined as tumor on ink
- Adjuvant hormone therapy, chemotherapy and radiotherapy were given to patients based on recommendations of current breast cancer guidelines
- Incidence of recurrence or death due to breast cancer was ascertained at the most recent follow-up which ended on 12 Sep 2018.

Cost- analysis of C-NSM versus R-NSM

- The medical cost or expenses associated with robotic and conventional NSM with IPBR were collected and compared
- Medical cost incurred for each procedure included **all the hospital cost regarding medical and surgical treatment**
- Information on surgery-related expenses was obtained from the information department of the CCH
- In Taiwan, the **operation fees of breast reconstruction and robotic breast surgery** were not reimbursed by national insurance
- Cost is expressed in New Taiwan dollar (NTD) and in United States dollar (USD). An exchange rate of 31 NTD/USD was used to convert NTD to USD

Aesthetic outcome evaluation

Patient-reported Outcomes



- Post-operative aesthetic results was evaluated by **comparing pre-operative and post-operative cosmetic results**
- A **self-reported questionnaire** to evaluate the cosmetic outcome of breast cancer patients with mastectomy following breast reconstruction was conducted 1-3 months after the operation when their surgical wounds healed

Results

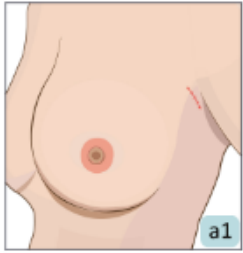
- 36 patients received R-NSM with IPBR
- 62 patients received C-NSM with IPBR

Enrolled in current case control comparison study

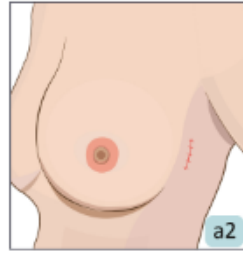
		R-NSM N=36 (%)	C-NSM N=62 (%)	P value
Age		48.6 ± 10.5	49.34 ± 10.6	0.714
Location	Right	19 (42.2)	26 (57.8)	0.229
	Left	17 (32.1)	36 (67.9)	
Sonogram tumor size (cm)		2.87 ± 1.26	2.57 ± 1.62	0.422
Mammogram tumor size (cm)		3.31 ± 0.70	3.07 ± 1.84	0.801
Pathology tumor size (cm)		2.65 ± 2.84	2.45 ± 1.62	0.699
Clinical stage	0	8 (30.8)	18 (69.2)	0.209
	I	3 (20.0)	12 (80.0)	
	II a	13 (40.6)	19 (59.4)	
	II b	3 (37.5)	5 (62.5)	
	III a	2 (100.0)	0 (0.0)	
Lymph node surgery	SLNB only	22 (37.3)	37 (62.7)	0.618
	SLNB then ALND	7 (38.9)	11 (61.1)	
	ALND	1 (14.3)	6 (85.7)	
	Not down	6 (42.9)	8 (57.1)	
Lymph node meta	Yes	25 (33.8)	49 (66.2)	0.287
	No	11 (45.8)	13 (54.2)	
Lymph node stage	N0	25 (33.8)	49 (66.2)	0.017
	N1	8 (42.1)	11 (57.9)	
	N2	3 (60.0)	2 (40.0)	
Stage	0	8 (33.3)	16 (66.7)	0.931
	I	7 (33.3)	14 (66.7)	
	II a	8 (32.0)	17 (68.0)	

- Age,
 - Location,
 - Tumor size
 - Lymph node status
 - Stage
- of these two groups of patient were comparable

R-NSM



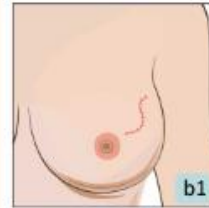
93%



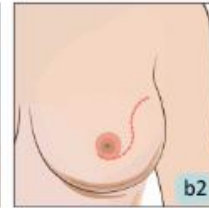
7%

A

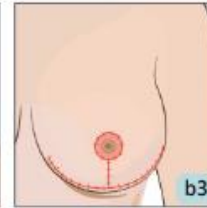
C-NSM



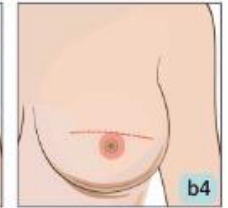
71%



10%



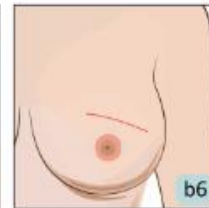
5%



3%



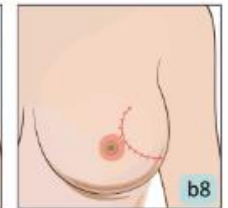
3%



3%



2%



2%

B

Peri-operative parameters and complications associated with R-NSM vs C-NSM with IPBR

Table 2. Peri-operative parameters and complications associated with robotic versus conventional nipple sparing mastectomy and immediate prosthesis breast reconstruction for breast cancer.

	All NSM (N=98)	R-NSM (n=36)	C-NSM (n=62)	P value
All operation time (minute)	217.4 ± 76.3	246.6 ± 60.6	197.1 ± 79.9	0.002
Blood loss (ml)	77.2 ± 60.1	34.6 ± 31.8	104.3 ± 71.0	<0.001
Hospital stay (days)	5.8 ± 1.5	6.9 ± 1.4	5.2 ± 1.2	<0.001
Mean mastectomy weight (gm)	308.0 ± 100.0	322.3 ± 82.4	299.7 ± 108.7	0.284
Reconstruction implant volume (ml)	348.3 ± 266.3	281.4 ± 132.6	387.1 ± 313.8	0.058

- **Mean operation time** for C-NSM group was 197.1 ± 79.9 mins, and 246.6 ± 60.6 mins for R-NSM group (P=0.002)
- **Mean blood loss** was 34.6 ± 31.8 ml in R-NSM group, and was 104.3 ± 71.0 ml for C-NSM group (P<0.001)



10%



5%



5%



Complications

Complication of NSM related	All NSM (N=98)		R-NSM (n=36)		C-NSM (n=62)		P value
Delayed wound healing	7	(5.1%)	2	(5.6%)	5	(8.1%)	1.0
Any degree of nipple ischemia event	12	(12.2%)	3	(8.3%)	9	(14.5%)	0.53
Transient nipple ischemia only	9	(9.2%)	3	(8.3%)	6	(9.7%)	1
Partial nipple areolar complex necrosis	3	(3.1%)	0	(0%)	3	(4.8%)	0.30
Total nipple areolar complex necrosis	0	(0%)	0	(0%)	0	(0%)	1.0
Seroma formation needing aspiration*	7	(7.1%)	2	(5.6%)	5	(8.1%)	0.71
Blister formation (small region)	1	(1.0%)	1	(2.8%)	0	(0%)	0.37
Skin flap small partial ischemia necrosis [#]	7	(7.1%)	2	(5.6%)	8	(12.9%)	0.32
Hematoma formation	1	(1.0%)	0	(0%)	1	(1.6%)	1.0
Implant loss	1	(1.0%)	0	(0%)	1	(1.6%)	1.0
Overall any complication	All NSM		R-NSM (n=36)		C-NSM (n=62)		P value
Yes	39	(39.8%)	10	(27.8%)	29	(46.8%)	0.09
No	59	(60.2%)	26	(72.2%)	33	(53.2%)	

Cost comparison analysis of R-NSM vs C-NSM with IPBR

Table 3 Comparison of the cost of conventional nipple-sparing mastectomy (C-NSM) with immediate prosthetic breast reconstruction (IPBR) with robotic nipple sparing mastectomy (R-NSM) with IPBR

	Medical cost Average covered by National insurance*		Medical cost pay by patients# For unilateral breast cancer		All cost needed for NSM and IPBR (per breast)		p
	NTD	USD	NTD	USD	NTD	USD	
C-NSM and IPBR	67,806.7 ± 12,406.5 (39,149-107,469)	2,118.9 ± 387.7 (1,223.4-3,358.4)	100,000-130,000	3,226-4,500	176,772.3 ± 20,484.9 (139,149-234,749)	5,702.3 ± 660.8 (4,488.7-7,572.5)	<0.01
R-NSM and IPBR	89,677.3 ± 20,497.5 (43,838-137,994)	2,802.4 ± 640.5 (1,369.9-4,312.3)	230,000-250,000	7,400-8,100	337,177.2 ± 24,681.2 (293,838-417,926)	10,876.6 ± 796.2 (9,478.6-13,481.5)	

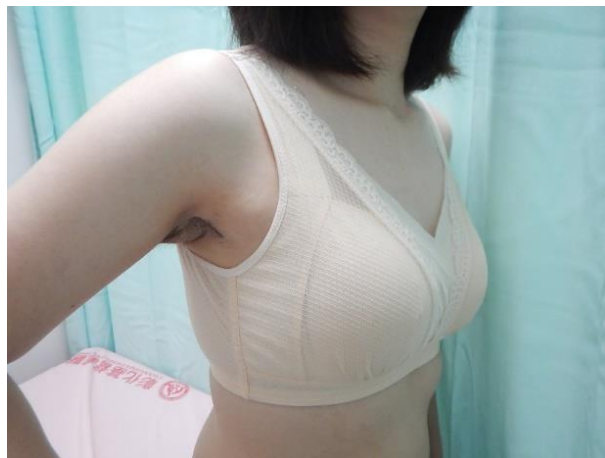
NSM: nipple-sparing mastectomy, NTD: New Taiwan dollar, USD: United States dollar, 1 USD equals 31 NTDs.

Medical cost Average covered by National insurance* including operations fee for breast cancer and/or axillary lymph node surgery. Anesthesia, medication, admission fee, and all other medical related fees including medication, doctors, and nursing. (excluding prosthesis and other reconstructions related fee)

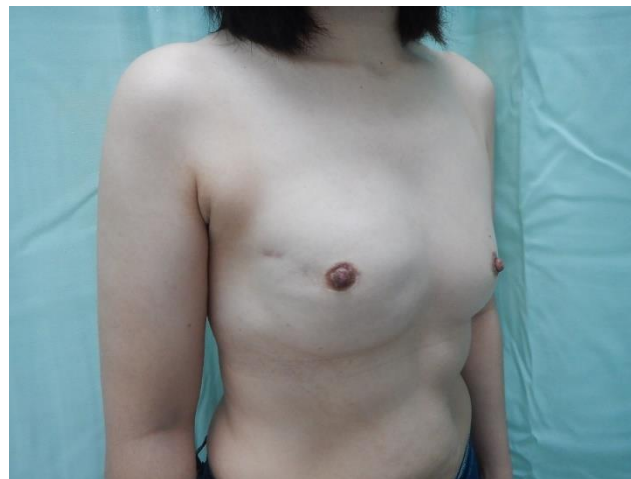
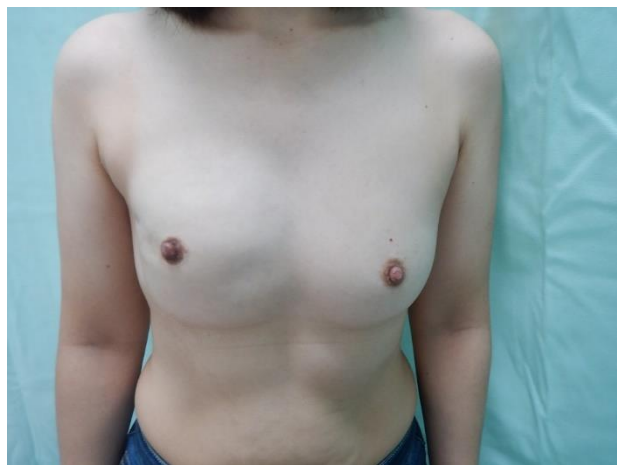
Medical cost pay by patients#: including fees for breast reconstruction, fee for robotic breast surgery, instruments, prosthetic implants.

The medical cost covered by national insurance included operations fee for breast cancer and/or axillary lymph node surgery, anesthesia, admission fee, and all other medical related. The medical cost not reimbursed by national insurance, and needed to pay by patients included fees for breast reconstruction, fee for robotic breast surgery, instruments, prosthetic implants. In Taiwan, the operation fees of breast reconstruction and robotic breast surgery were not reimbursed by national insurance.

Conventional NSM + IPBR



With underwear



Naked without closes

Bil. R-NSM + IPBR



With underwear



Without closes

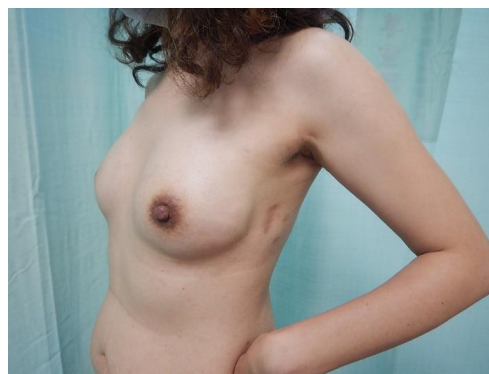
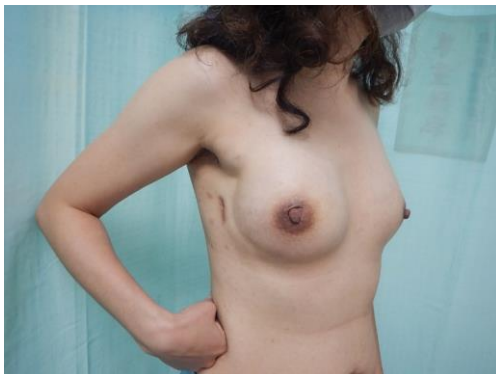


Table 4 Patient-reported cosmetic result for robotic nipple sparing mastectomy (R-NSM) and immediate prosthesis breast reconstruction (IPBR) or conventional nipple sparing mastectomy (C-NSM) and IPBR

	<u>R-NSM and IPBR</u>					<u>C-NSM and IPBR</u>					P value
	Unsatisfied	Fair	Satisfied	Excellent	Mean score	Unsatisfied	Fair	Satisfied	Excellent	Mean score	
Q1. Preoperative breast appearance satisfaction.	2 (7.1%)	1 (3.6%)	15 (53.6%)	10 (35.7%)	3.3 ± 1.0	0 (0.0%)	3 (6.7%)	16 (35.6%)	26 (57.8%)	3.5 ± 0.6	0.088
Q2. Postoperative breast appearance satisfaction – <u>dressed with clothes.</u>	0 (0.0%)	0 (0.0%)	12 (42.9%)	16 (57.1%)	3.6 ± 0.6	0 (0.0%)	6 (13.3%)	23 (51.1%)	16 (35.6%)	3.2 ± 0.7	0.055
Q3. Postoperative breast appearance satisfaction – <u>naked without clothes.</u>	0 (0.0%)	2 (7.1%)	15 (53.6%)	11 (39.3%)	3.3 ± 0.7	4 (8.9%)	13 (28.9%)	18 (40.0%)	10 (22.2%)	2.8 ± 0.9	0.030

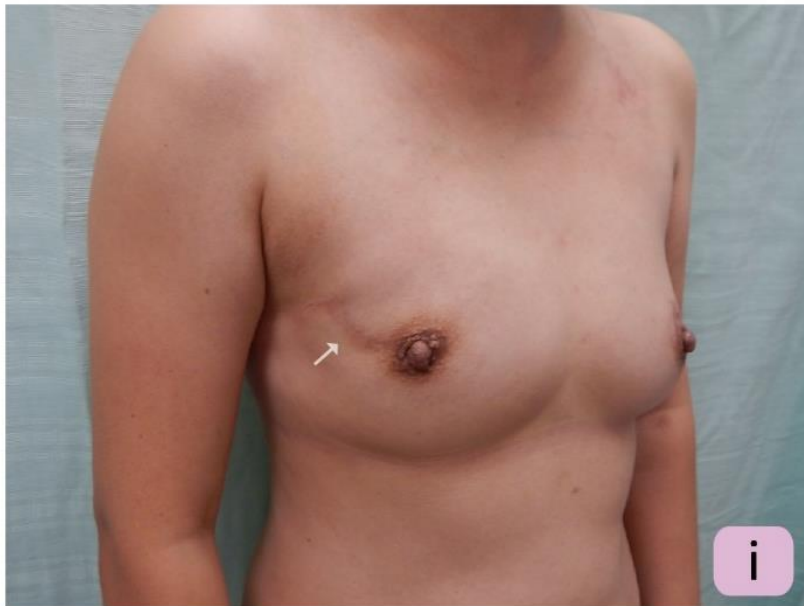


Table 4 Patient-reported cosmetic result for robotic nipple sparing mastectomy (R-NSM) and immediate prosthesis breast reconstruction (IPBR) or conventional nipple sparing mastectomy (C-NSM) and IPBR

	R-NSM and IPBR				Mean score	C-NSM and IPBR				Mean score	P value
	Unsatisfied	Fair	Satisfied	Excellent		Unsatisfied	Fair	Satisfied	Excellent		
Q4. Postoperative symmetry of bilateral breast size satisfaction.	0 (0.0%)	4 (14.3%)	12 (42.9%)	12 (42.9%)	3.3 ± 0.7	2 (4.4%)	7 (15.6%)	24 (53.3%)	12 (26.7%)	3.0 ± 0.8	0.388
Q5. Postoperative symmetry of bilateral breast size satisfaction.	0 (0.0%)	4 (14.3%)	14 (50.0%)	10 (35.7%)	3.3 ± 0.7	1 (2.2%)	9 (20.0%)	22 (48.9%)	13 (28.9%)	3.0 ± 0.8	0.753
Q6. Postoperative symmetry of nipple areola position satisfaction.	0 (0.0%)	1 (3.6%)	16 (57.1%)	11 (39.3%)	3.8 ± 0.4	1 (2.2%)	8 (17.8%)	24 (53.3%)	12 (26.7%)	3.0 ± 0.7	0.225

Symmetry of size, shape, and nipple position

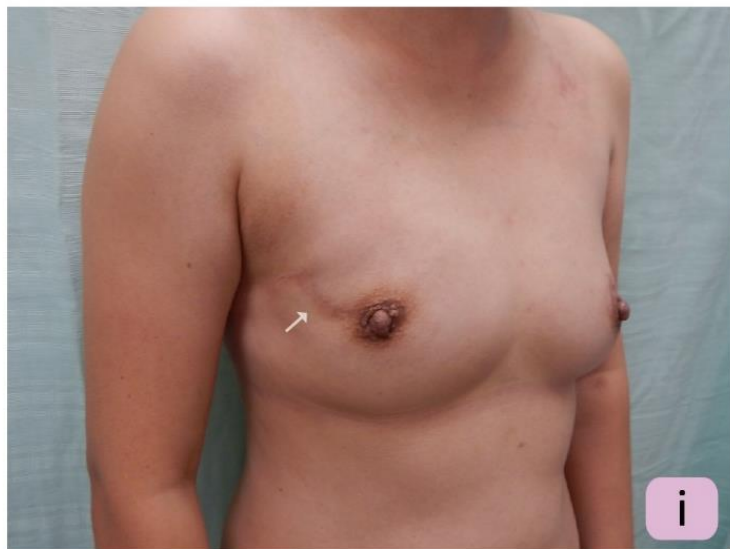
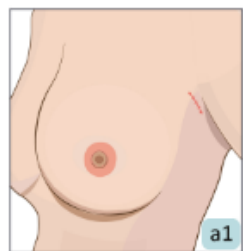


Table 4 Patient-reported cosmetic result for robotic nipple sparing mastectomy (R-NSM) and immediate prosthesis breast reconstruction (IPBR) or conventional nipple sparing mastectomy (C-NSM) and IPBR

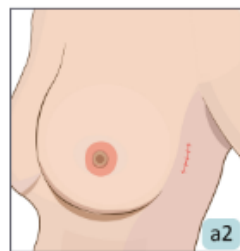
	R-NSM and IPBR				Mean score	C-NSM and IPBR				Mean score	P value
	Unsatisfied	Fair	Satisfied	Excellent		Unsatisfied	Fair	Satisfied	Excellent		
Q7. Scar appearance satisfaction.	0 (0.0%)	1 (3.6%)	9 (32.1%)	18 (64.3%)	3.7 ± 0.6	0 (0.0%)	7 (15.6%)	24 (53.3%)	14 (31.1%)	3.2 ± 0.7	0.016
Q8. Scar length satisfaction.	0 (0.0%)	0 (0.0%)	9 (32.1%)	19 (67.9%)	3.8 ± 0.6	0 (0.0%)	8 (17.8%)	23 (51.1%)	14 (31.1%)	3.1 ± 0.7	0.003
Q9. Surgical wound position satisfaction.	0 (0.0%)	0 (0.0%)	8 (28.6%)	20 (71.4%)	3.8 ± 0.6	0 (0.0%)	6 (13.3%)	23 (51.1%)	16 (35.6%)	3.2 ± 0.7	0.006

Scar appearance, length, and location

R-NSM



93%



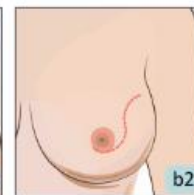
7%

A

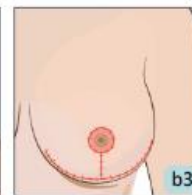
C-NSM



71%



10%



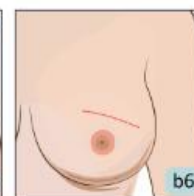
5%



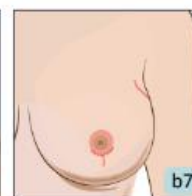
3%



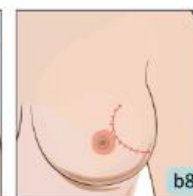
3%



3%



2%



2%

B

Table 4 Patient-reported cosmetic result for robotic nipple sparing mastectomy (R-NSM) and immediate prosthesis breast reconstruction (IPBR) or conventional nipple sparing mastectomy (C-NSM) and IPBR

Overall score*	<u>R-NSM and IPBR</u>				<u>C-NSM and IPBR</u>				P value
	Unsatisfied	Fair	Good	Excellent	Unsatisfied	Fair	Good	Excellent	
Range	8	9-16	17-24	25-32	8	9-16	17-24	25-32	
	0 (0.0%)	0 (0.0%)	1 (3.6%)	27 (96.4%)	0 (0.0%)	0 (0.0%)	11 (24.4%)	34 (75.6%)	0.019

Q: question, R-NSM: robotic nipple *overall score: summation of question Q2 to Q9 for representation of overall satisfaction index.

To evaluate the overall satisfaction of C-NSM/R-NSM and immediate prosthesis breast reconstruction (IPBR), the overall score of question #2 to 9 in each patient was summarized. Those with an overall score of 8–11 were graded as “poor”, a score of 12–19 was graded as “fair”, a score of 20–27 was graded as “good”, and a score of 28–32 was graded as “excellent”. Patients with results graded as “excellent” or “good” were defined as being satisfied with the cosmetic results.

Oncologic Safety Evaluation

		R-NSM	C-NSM	P value
Margin status	Involved	N=36 (%) 1 (100.0)	N=62 (%) 0 (0.0)	0.187
	No involved	35 (36.1)	62 (63.9)	
Recurrence	Yes	0 (0.0)	5 (100.0)	0.080
	No	36 (38.7)	57 (61.3)	
Follow up time (months)		9.1 ± 5.6	47.3 ± 19.6	<0.001

Discussion

- This is the first reported study as we know to compare conventional versus robotic NSM in the management of breast cancer.
- Solid data was provided to show the difference of operation time, and cost of R-NSM compared with C-NSM
- There is an **observed trend toward decreasing NAC and skin flap ischemia/necrosis, and overall morbidity in R-NSM group**, however, it was statistically not significant.

- The cosmetic outcome regarding symmetry of bilateral breast size, shape, and nipple position were not different between R-NSM and C-NSM.
- These findings reflected some valuable information that in the experienced hand of surgeons there might not be apparent difference in complication or cosmetic result either with conventional surgical approach or operated through robotic surgical platform.

- Our study is limited in:
 - its **retrospective** nature
 - **small** sample size
 - possible **selection bias** among these two (robotic or conventional approach) methods
 - Oncologic safety
 - ✓ The **lack of long-term follow-up** results in current study could not answer whether patients receive R-NSM would had similar loco-regional recurrence or distant free survival with patients in C-NSM group

- The major advantages of R-NSM over C-NSM were
 - decrease of blood loss during operation and better wound/scar results
 - The blood loss was significantly decreased in R-NSM group, which might be related to the positive air pressure and delicate robotic instruments
 - The smaller wound length and location,
 - Hidden in extra-mammary inconspicuous axilla area were highly favored according to patient-reported cosmetic results

Do we improved after R-NSM?

NSM 2011.08



1st RNSM 2017.



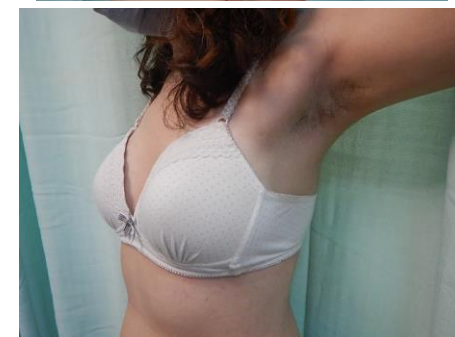
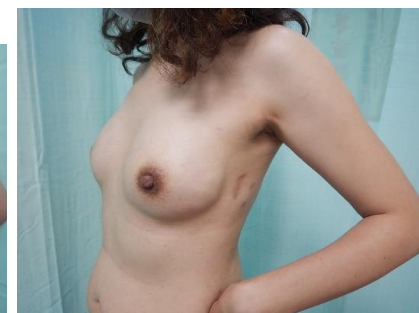
R-NSM 2018.08



R-NSM 2018.09



R-NSM 2018.09



Conclusion

- R-NSM compared favorably to C-NSM with comparable clinical outcomes, minimal blood loss and higher patients' satisfaction but at the expense of higher cost and longer operation time

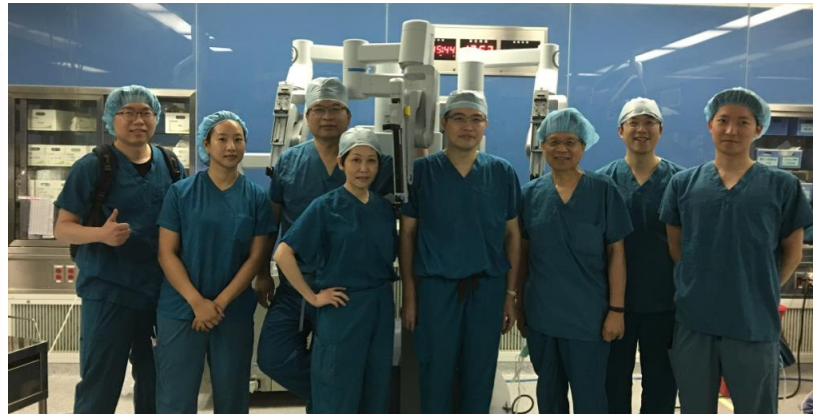


Endoscopy and Oncoplastic Surgery Center
Robotic Mastectomy Case Observation
Center



Hung-Wen Lai: 143809@cch.org.tw

First Robotic Mastectomy Case Observation Center in Asia



YAHOO! 奇摩 新聞

搜尋 搜尋新聞 搜尋網頁

熱門話題: 85度C 郭台銘 台達電 吳州備 解英文 癌症

首頁 政治 財經 論壇 娛樂 運動 社會地方 國際 生活 健康 科技 氣象 影音 我的追蹤

亞洲第一！彰基成立RMCCO

健康醫療網 | 456人追蹤 追蹤

健康醫療網 / 記者吳佩均報導 2018年8月31日 下午2:06



Recent course for robotic case observation:
4 May 2019

ROBOTIC MASTECTOMY CASE OBSERVATION ADVANCED COURSE WITH PROCTORSHIP



Robotic Mastectomy Case Observation

- Targets: Breast Surgeons
- Frequency: Bimonthly
- Date: May 15/Jul 10/Sep 11/Nov 13
- Maximum Attendance: 3-5
- Fee: USD \$500/per person

Focus

- Acceptable Console Time
- Single Incision
- Less Surgical Smoke
- Minimum Blood Loss
- Robotic Arms Collision Prevention
- Materials
- Procedure Guide
- Video Clip



Host:
Dr. Wang Wen Lai
Email:
14380@icch.org.tw
Coordinator:
Ms. Lin
386038@icch.org.tw
Location:
Changhua Christian Hospital
Address:
No. 125, Minshao St., Changhua
County, Taiwan

Around 10 robotic mastectomy case observations been held.

International Endoscopic & Robotic Breast Surgery Symposium



24 — 25 MAY 2019

Live
Demonstration
WORKSHOP

SYMPOSIUM



KEYNOTE SPEAKERS

- Dr. Antonio Toesca, Italy
- Dr. Benjamin Sarfati, France
- Dr. Jessec C. Selber, USA
- Dr. Eisuke Fukuma, Japan
- Dr. Hung Wen Lai, Taiwan
- Dr. Hyung Seok Park, South Korea

CONTACT US

+886 909190309

ierbs2019@gmail.com

SCAN
For more
INFORMATION



IERBS Website

ierbs.org
@ierbs2019
http://ierbs.org



REGISTRATION



Live Demonstration
WORKSHOP CHANGHUA CHRISTIAN HOSPITAL
SYMPOSIUM WINDSOR HOTEL, SAICHUNG



Endoscopic and oncoplastic breast surgery center at Changhua Christian Hospital
Taiwan Endoscopic Assisted Breast Surgery Cooperation Study Group



FORMOSA of Taiwan
臺灣國際醫療合作學會



Breast Cancer Society of Taiwan
台灣乳癌學會



PAS
台灣乳癌學會

Invited Speaker



Antonio Toesca
European Institute of Oncology,
Italy



Benjamin Sarfati
Institute Gustave Roussy,
France



Eisuke Fukuma
Kameda Medical Center,
Japan



Hung-Wen Lai
Changhua Christian Hospital,
Taiwan



Selber JC
MD Anderson Cancer center,
USA



Hyung Seok Park
Severance Hospital,
South Korea



Fiona Cheng
Shen Kong Wu Ho-Su Memorial Hospital,
Taiwan



Yao-Lung Kuo
National Cheng Kung University
Hospital, Taiwan



Chin-Sheng Hung
Shuang Ho Hospital,
Taiwan



Kuo-Hsiu Liao
Tri-Service General Hospital,
Taiwan



Wen-Ling Kuo
Chang Gung Memorial Hospital,
Linkou, Taiwan



Liang-Chih Liu
China Medical University Hospital,
Taiwan



Wei-Wen Chang
Taipei Municipal Wan Fang Hospital,
Taiwan



Fu Ou-Yang
Kaohsiung Medical University
Hospital, Taiwan



Hsiu-Pei Tsai
Chang Gung Memorial Hospital,
Linkou, Taiwan



Ho Yong Park
Kyungpook National University
Chilgok Hospital, Korea



Hisamitsu Zehn
Nakagami Hospital, Okinawa,
Japan



Chi Wei Mok
Chang General Hospital,
Singapore

Question ?
Limited seats
available for
IERBS 2019

- Indications of NSM

- ✓ Breast cancer patients who opted for mastectomy and were keen to preserve NAC
- ✓ No gross involvement of NAC as evaluated preoperatively through clinical examinations and imaging studies (mammography, sonography and/or breast magnetic resonance imaging).
- ✓ On the other hand, patients found to have nipple involvement during intra-operative frozen section would be subjected to NAC excision and a change of procedure to skin-sparing mastectomy instead.

- Indications of R-NSM

- ✓ The inclusion criteria for R-NSM were:

- Early stage breast cancer (carcinoma in situ, stage I - IIIA)
 - Tumor size less than 5 cm
 - No evidence of multiple lymph node metastasis
 - No evidence of nipple, skin or chest wall invasion.

✓ Contraindications of R-NSM include:

- those with apparent NAC involvement
- inflammatory breast cancer
- breast cancer with chest wall or skin invasion
- locally advanced breast cancer
- breast cancer with extensive axillary lymph node metastasis (stage IIIB or later)
- patients with severe co-morbid conditions, such as heart disease, renal failure, liver dysfunction, and poor performance status as assessed by the primary physicians
- Women with large (breast cup size larger than E or breast mastectomy weight >600gm) and ptotic breast were not good candidates for R-NSM and IBR with Gel implant due to technical limitations and sub-optimal cosmetic outcomes.