

Abdominal Bulging and Hernia Following Pedicle Transverse Rectus Abdominis Muscle Musculocutaneous Flap Reconstruction in Breast Cancer Patient: Ramathibodi's Hospital Experience

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Background: Transverse rectus abdominis myocutaneous flap (TRAM flap) following breast cancer surgery is a widely accepted method for breast reconstruction or defect coverage. Donor site morbidity resulting from the procedure is a great concern to surgeons and influences the patient's quality of life. In the present study we report our incidence of abdominal contour abnormalities after pedicled TRAM reconstruction and also the risk factors of these complications.

Objective: To identify incidence and risk factors of abdominal contour abnormalities after pedicled TRAM flap reconstruction.

Material and Method: We retrospectively reviewed the charts and operative notes of patients who underwent pedicled TRAM reconstruction between January 2008 to December 2014. The abdominal deformities were recorded and the risk factors we believed to be the cause of complication were identified and analyzed. The difference between the two techniques of TRAM flap reconstruction being used at that time was also analyzed.

Results: 126 patients underwent pedicled TRAM flap reconstruction. We found that 23% of our patients had abdominal complications which were higher than previous published literatures. The most common complication was abdominal bulging (21%). However, we found that age was the risk factor associate with the abdominal contour deformities.

Conclusion: Although acceptable, the number of patients with abdominal wall bulging in the present study is still high compared to previous studies. Only age (>40 years old) was a significant risk factor found in the present study. A further refinement of the operating techniques are warranted to minimize the complications from this procedure.

Keywords: Transverse rectus abdominis myocutaneous flap (TRAM flap), Abdominal bulging

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The transverse rectus abdominis myocutaneous (TRAM) flap reconstruction was first introduced in 1979 by Holmstrom and popularized by Hartrampf^(1,2). TRAM flap following breast cancer surgery is a widely accepted method for breast reconstruction or defect coverage. There are many techniques in creating the TRAM flap for example; pedicle TRAM, free TRAM or DIEP (deep inferior epigastric perforator) were proposed.

Donor site morbidity resulting from the procedure is a great concern to surgeons and influences the patient's quality of life. Hernia and abdominal

bulging (contour abnormalities of abdomen) are the major late complication, with an incidence ranging from 0 to 44%⁽³⁾. The causes of these abnormalities were known to be numerous including patient factors (such as obesity and smoking), differences in surgical technique, the method used to close the abdominal defect and even the surgeons' experience level. The importance of anterior abdominal sheath was emphasized in many studies and the closure of the defect was report to be more important than the amount of muscle removed⁽³⁻⁵⁾. Various techniques have been proposed in an attempt to decrease the donor site morbidity for example; muscle split, free flap, difference in the level of the muscle cut border, mesh application (inlay/on lay), type of mesh (synthetic and biological mesh) but still there is no one best technique.

At our institute, we use pedicled TRAM flap reconstruction with the whole muscle technique and

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the anterior fascial defect is covered with synthetic prolene mesh.

In the present study, we report our incidence of abdominal contour abnormalities after pedicle TRAM reconstruction. The abnormalities include abdominal bulging (abdominal wall relaxation without fascial defect) and hernia (abdominal wall relaxation with fascial defect)⁽⁵⁾. The present study also focuses on the cause of the abdominal contour abnormalities.

Material and Method

We retrospectively reviewed the operative notes and charts of the patients who underwent breast reconstruction using the pedicled TRAM flap (whole muscle) between January 2008 to December 2014. However, during that period there were some changes in the technique that we use to close the anterior sheath defect which we will refer in the present study as “old technique” and “new technique”. Details of the surgical techniques are described below in the “operative technique” subheading. Patients receiving either technique are included in this study and comparison between these two techniques were also noted.

Patients’ age, body mass index, associated comorbidities and smoking history were documented. The surgical factors such as previous abdominal surgeries, ipsilateral or bilateral procedure, operative time and the result of the operation were also collected. Patients who received neoadjuvant chemotherapy were also included in our study and neoadjuvant treatment was analyzed as one of the risk factors. The primary outcome of abdominal contour deformities, both bulging and hernia, after the TRAM flap reconstruction was reviewed and the risk factors were analyzed. Definition of hernia was a protrusion of the abdominal wall with dehiscence of the fascial closure and an abdominal bulge was any asymmetrical abdominal contour developed after the procedure without an associated fascial defect.

Operative technique

TRAM flap is harvested using a standard elliptical incision at the lower abdomen, from lateral to medial. 0.5 to 1 cm of anterior rectus fascia are left on each side. This will preserve part of linea semilunaris and the fibrous tissue for mesh fixation. The rectus abdominis muscle is clamped with Kocher clamp and transversely cut at the level of the arcuate line. The inferior epigastric vessels are ligated. The anterior fascial defect is then closed with polypropylene mesh. The mesh is fixed with the remnant of the anterior sheath

both medially and laterally using Prolene suture (2/0) interruptedly and then continuously. In the old technique (which was used mostly in our series), the mesh will cover from the costal margin to cooper’s ligament. But in the other technique, we referred as “new technique”, the distal end of the rectus abdominis muscle and the anterior sheath was suture to the posterior sheath to reinforce the abdominal wall below the arcuate line and the mesh was fixed to cover the defect from the costal margin down to the cut edge of the muscle without tension⁽⁶⁾. Two drains were placed before closure of abdominal wall with interrupted absorbable suture.

Statistical analysis

Data analysis was performed using STATA version 14 presenting data with descriptive statistics such as frequency, percent, mean, standard deviation, median and inter-quartile range/range.

When comparing between groups (new technique vs. old technique/complication vs. non complication), a *p*-value of less than 0.05 was considered statistical significant.

1) Continuous data (normal distribution) was presented as mean with standard deviation using *t*-test (Age, Height, Weight, BMI, Operative time, follow-up time (months)).

2) Continuous data (non-normal distribution) was presented as median with inter-quartile range using Wilcoxon Mann-Whitney test (time to repair date and time to complication).

3) Categorical data as a frequency with percentage use Chi-square test are use expected value >5 from sample data, that’s summarize less than 20% for all data and Fisher’s exact test are use expected value <5 from sample data, that’s summarize more than 20% for all data.

4) Risk factor for complication using logistics regression tests were presented as odd ratio, risk factors were compared using binary logistics on the univariate analysis.

Results

126 patients underwent breast reconstruction with pedicled TRAM flap. The majority of the patients were diagnosed with breast cancer and some were diagnosed with phyllodes tumor. Seven patients underwent bilateral TRAM reconstructions so, the total number of flaps evaluated in our series is 133. The mean follow-up time was 56 months in average. We used the old technique for abdominal wall closure in

Table 1. Patient characteristics of 126 patients in whom underwent breast reconstruction with pedicled TRAM flap

variable	n = 126	Range
Age, mean (SD)	43.52 ($\pm$ 7.28)	27 to 61
Weight, mean (SD)	57.25 ($\pm$ 7.96)	42.7 to 76.5
Height (m), mean (SD)	1.57 ($\pm$ 0.06)	1.46 to 1.76
BMI, mean (SD)	23.19 ($\pm$ 3.05)	16.69 to 32.47
Underlying		
No	91 (77.78)	
Yes	26 (22.22)	
Smoking history		
No	123 (99.19)	
Yes	1 (0.81)	
Diagnosis		
Breast cancer	117 (92.86)	
Phyllodes tumor	9 (7.14)	
New technique	17 (13.49)	
Old technique	109 (86.51)	
Operative time, median (IQR)	225 (77.5)	95 to 465
Pre-operative radiation		
No	124 (100)	
Yes	-	
Post-operative radiation		
No	101 (81.45)	
Yes	23 (18.55)	
Breast side		
Left	64 (50.79)	
Right	59 (46.83)	
Both	3 (2.38)	
Bilateral TRAM reconstruction		
No	119 (94.44)	
Yes	7 (5.56)	
Type breast surgery		
No surgery (delay reconstruction)	12 (9.52)	
Nipple sparing mastectomy	6 (4.76)	
Skin sparing mastectomy	92 (73.02)	
Simple mastectomy	16 (12.70)	
Lumpectomy	-	
Axillary node procedure		
None	21 (16.67)	
SLNB	63 (50.00)	
ALND	16 (12.70)	
SLNB+ALND	26 (20.63)	
Reconstruction timing		
Immediate reconstruction	114 (90.48)	
Delay reconstruction	12 (9.52)	

Table 1. Cont.

Variable	n = 126	Range
TRAM side		
Ipsilateral flap	111 (91.74)	
Contralateral flap	2 (1.65)	
Bipedicle TRAM flap	-	
Bilateral ipsilateral TRAM flap	8 (6.61)	
Previous abdominal surgery		
No	79 (63.20)	
Yes	46 (36.80)	
Abdominal surgery type		
No	79 (63.20)	
Appendectomy (Mcb)	5 (4.00)	
Appendec (Mcb) with C/S (Pfen)	1 (0.80)	
C/S (Pfen)	23 (18.40)	
Low midline (TAH, c/s)	14 (11.20)	
TR	2 (1.60)	
Other	1 (0.80)	
Complication		
No	97 (76.98)	
Have	29 (23.02)	
Complication type		
No complication	97 (76.98)	
Bulging	23 (18.25)	
Bulging and hernia	1 (0.79)	
Hernia	3 (2.38)	
Other: exposed mesh	2 (1.59)	
Repair		
No	123 (97.62)	
Yes	3 (2.38)	

109 patients and the new technique in 17 patients. Ninety-one percent of TRAM flap harvested in this series are ipsilateral, only a small number were harvested from the contralateral side (1.65%) and 6.1% were harvested from both sides at the same time (bilateral TRAM flap). Most of our patients (114 patients) had the flap done immediately after oncologic surgery (90.5%) while the remaining patients had delay reconstructions (9.5%). Patients' age range from 27 to 61 years old with a mean of 43.52 years. The average BMI was normal but some underweight patient was also recorded (mean BMI 23.19). The BMI was then divided into 4 groups according to the WHO classification range. Sixty-nine percent of our patients were in the normal weight group (BMI 18.5% to 25%).

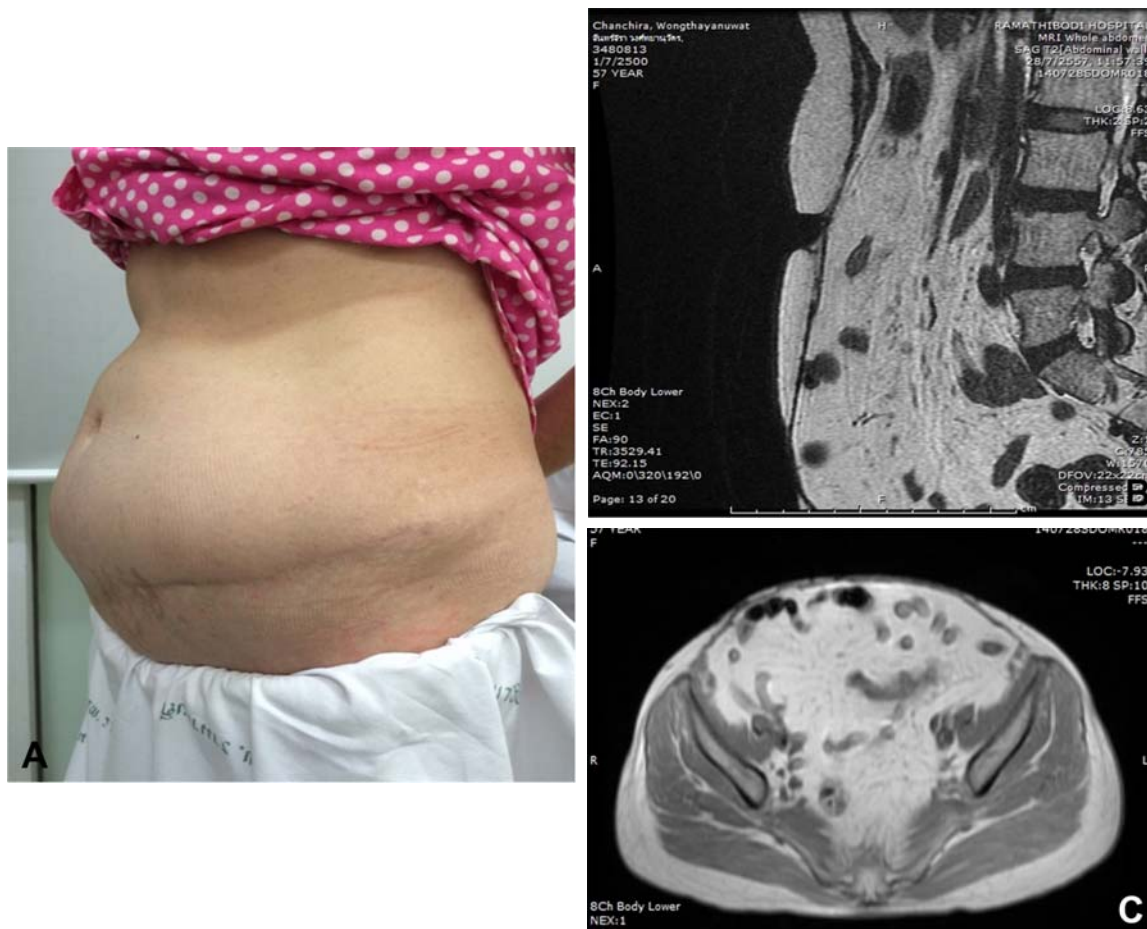


Fig. 1 Presentation of the abdominal wall deformities occurred within 5 years after performing bilateral delayed Tram flap. A) The patient developed abdominal hernia and bulging at the lower abdomen, B and C) The MRI showed few surgical material at lower anterior abdominal wall and focal abdominal wall defect at umbilical level 7.3x1.2 cm without evidence bowel or fat herniation.

Twenty-five percent were categorized in the overweight group (BMI >25). Only one patient in our series was found to have smoking history (0.18%). Ninety-one patients had no co-morbidities (77%) and 22 patients presented with co-morbidities (22%). Forty-seven patients had abdominal surgeries prior to the pedicled TRAM flap operation. The type of scar most commonly found in our patients was the low transverse abdominal scar from caesarian sections (18%) (Table 1).

The abdominal wall deformities were found in 27 patients (21%) (Fig. 1). Twenty-three patients were reported to have abdominal wall bulging (18%), only 3 patients were reported to have abdominal wall hernia and 1 patient who had both types of the contour deformities (Table 1). A further analysis was done to compare between the old technique group and the new

technique group. Demographic data of the patients in both group were not significantly different (Table 2). Abdominal contour deformities were found in both groups with 25 patients in the old technique group (22%) and 4 patients in the new technique group (23%), which is not statistically significant. However, there was no report of hernia in the new technique group and no reoperation to correct abdominal contour performed in this group (Table 2).

When compare both complication and non-complication groups to identify the risk factors associated with abdominal contour deformities. The only risk factor we found to be significant for increasing complication rate was age. In patients age above 40 years old, the complications were significantly higher (odd ratio was 2.806, p -value = 0.040).

Table 2. Comparison between patients with new technique and old technique

Variable	New technique (n = 17)	Old technique (n = 109)	95% CI	p-value
Age op, mean (SD)	42.29 (± 7.06)	43.72 (± 7.33)	42.24 to 44.81	0.456
Weight, mean (SD)	58.81 (± 6.14)	57.00 (± 8.19)	55.84 to 58.66	0.391
Height (m), mean (SD)	1.58 (± 0.06)	1.57 (± 0.05)	1.56 to 1.58	0.578
BMI, mean (SD)	23.65 (± 2.86)	23.13 (± 3.09)	22.65 to 23.73	0.508
Underlying				
No	13 (76.47)	78 (78.00)		0.999
Yes	4 (23.53)	22 (22.00)		
Smoke				
No	17 (100)	106 (99.07)		0.999
Yes	0	1 (0.93)		
Diagnosis				
Breast cancer	14 (82.35)	103 (94.50)		0.103
Phyllodes tumor	3 (17.65)	6 (5.50)		
Operative time, median (IQR)	280 (45)	220 (76)	220.00 to 241.59	0.0003
Bilateral TRAM reconstruction				
No	16 (94.12)	103 (94.50)		0.999
Yes	1 (5.88)	6 (5.50)		
Timing for reconstruction				
Immediate TRAM	17 (100)	97 (88.99)		0.367
Delay TRAM reconstruction	0	12 (11.01)		
Flap side				
Ipsilateral	16 (94.12)	95 (91.35)		0.999
Contralateral	0	2 (1.92)		
Bi-pedicle	0	0		
Bilateral ipsilateral flap	1 (5.88)	7 (6.73)		
Previous abdominal surgery				
No	14 (82.35)	65 (60.19)		0.105
Yes	3 (17.65)	43 (39.81)		
Type of previous abdominal surgery				
No	14 (82.35)	65 (60.19)		0.233
Appendectomy (Mcb)	0	5 (4.63)		
Appendectomy (Mcb) with C/S (Pfen)	0	1 (0.93)		
C/S (Pfen)	0	23 (21.30)		
Low midline (TAH, c/s)	3 (17.65)	11 (10.19)		
TR (low midline)	0	2 (1.85)		
Other	0	1 (0.93)		
T staging				
In situ	0	10 (9.90)		0.233
1	2 (14.29)	36 (35.64)		
2	10 (71.43)	49 (48.51)		
3	1 (7.14)	4 (3.96)		
1 mi	1 (7.14)	2 (1.98)		
N staging				
0	7 (50.00)	63 (62.38)		0.581
1	3 (21.43)	20 (19.80)		
2	2 (14.29)	9 (8.91)		
3	2 (14.29)	6 (5.94)		
1 mi	0	3 (2.97)		
M staging				
0	14 (100)	101 (100)		-

Table 2. Cont.

Variable	New technique (n = 17)	Old technique (n = 109)	95% CI	p-value
Complications				
No	13 (76.47)	84 (77.06)		0.999
Yes	4 (23.53)	25 (22.94)		
Complication type				
None	13 (76.47)	84 (77.06)		0.893
Bulging	4 (23.53)	20 (18.35)		
Bulging and hernia	0	1 (0.92)		
Hernia	0	3 (2.75)		
Other	0	2 (1.83)		
Repair				
No	17 (100)	106 (97.25)		0.999
Yes	0	3 (2.75)		

Comparing between old technique and new technique, there was no significant difference with odds ratio = 1.034 (p -value = 0.957). Co-morbidity was also not the risk factor in our series. Previous abdominal surgery was also not significantly increase the complication rate (OR = 1.065, p -value = 0.885). The type of flap selection such as ipsilateral or bilateral did not increase the risk of abdominal contour deformity. Delay reconstruction also did not increase risk of abdominal complication (Table 3). The adjuvant chemotherapy (OR = 0.58, p -value = 0.227) and adjuvant hormonal treatment (OR = 1.52, p -value = 0.391) were also not the risk factors in our series. BMI was reported in groups, and we found no correlation between BMI and abdominal complication (Table 3).

Discussion

Donor site morbidity is still a concern to patients and an influence to the quality of life. Hernia and abdominal bulging (contour abnormalities of abdomen) are the major late complication, with an incidence ranging from 0 to 44%⁽³⁾. In our institute, we use pedicled TRAM flap reconstruction with the whole muscle technique and the anterior fascial defect is covered with synthetic prolene mesh. Despite many attempts to develop the best technique, there is still no one best conclusion.

In the present study, most of our patients were non-smokers. We found only one smoker in our series. The patients were also mostly in the normal BMI group.

In our series, the overall donor site complication was 23% which is higher than a previous report by Kim et al (16.4%)⁽⁷⁾. We found abdominal

contour abnormality in 21% of our patients. Most of the deformities are bulging (18%) with only 3 cases of abdominal wall hernia (2%). The number of the abdominal bulging in other series is slightly than ours at 9.5% but their incident of hernia is slightly higher at 3.9%⁽²⁾.

Ages was found to have an impact on abdominal contour deformities. The patients age above 40 years old were shown to have more incidence of abdominal contour deformities (OD 2.8, p -value = 0.04) (Table 3).

Many factors have been reported to influence the chance of abdominal contour deformities after pedicled TRAM flap reconstruction such as obesity (BMI more than 30) as reported by Lee et al⁽⁸⁾, Chirappapha et al⁽⁹⁾ and Ireton et al^(10,11). Although some may consider obesity the contraindication for TRAM flap reconstruction, the morphological characteristics peculiar to this population make obese women ideal candidates for this procedure because the reconstructed breast must often match a large ptotic contralateral breast⁽¹²⁾. But there are some studies that suggest that obesity is not the contraindication and TRAM can be used with caution⁽¹³⁾. In this series we found no correlation between higher BMI and abdominal complication as shown in Table 3.

Bilateral TRAM flap reconstruction was also one of the risk factors reported in previous studies^(9,11) and a study show contradicting results⁽¹⁴⁾, but also not significantly related to donor site morbidities in the present study (p -value = 0.09).

The effect of chemotherapy as the adjuvant treatment for breast cancer on the healing of the TRAM

Table 3. Demographic data comparing between complication and non-complication group and the risk factors for abdominal deformities

variable	Non complication (n = 97)	Complication (n = 29)	p-value	OR (95% CI)	p-value
Age, n (%)					
≤40	41 (42.27)	6 (20.69)	0.035	1	0.040
>40	56 (57.73)	23 (79.31)		2.806 (1.05 to 7.51)	
BMI					
Under weight (<18.5)	3 (3.16)	3 (10.34)	0.351	1	0.163
Normal (18.5 to 25)	66 (69.47)	20 (68.97)		0.303 (0.06 to 1.62)	
Overweight (25.1 to 30)	23 (24.21)	5 (17.24)		0.217 (0.3 to 1.41)	
Obesity (>30)	3 (3.16)	1 (3.45)		0.333 (0.02 to 5.33)	
Tech					
New	13 (13.40)	4 (13.79)	0.999	1	0.957
Old	84 (86.60)	25 (86.21)		1.034 (0.31 to 3.45)	
Operative time (min), median (IQR)	225 (72.5)	237.5 (102.5)	0.293	1.005 (0.99 to 1.01)	0.181
Underlying, n (%)					
No	71 (78.89)	20 (74.07)	0.598	1	0.598
Yes	19 (21.11)	7 (25.93)		1.307 (0.48 to 3.55)	
Smoke, n (%)					
No	94 (98.95)	29 (100)	0.999	-	-
Yes	1 (1.05)	0		-	
Bilateral reconstruction, n (%)					
No	93 (95.88)	26 (89.66)	0.199	1	0.215
Yes	4 (4.12)	3 (10.34)		2.683 (0.56 to 12.75)	
Timing for reconstruction, n (%)					
Immediate	89 (91.75)	25 (86.21)	0.470	1	0.377
Delay	8 (8.25)	4 (13.79)		1.780 (0.49 to 6.40)	
Flap elevation side, n (%)					
Ipsilateral	88 (94.62)	23 (82.14)	0.090	1	0.349
Contralateral	1 (1.08)	1 (3.57)		3.826 (0.23 to 63.52)	
Bipedicle	0	0		-	
Bilateral ipsilateral	4 (4.30)	4 (14.29)		3.826 (0.88 to 16.47)	
Previous abdominal surgery, n (%)					
No	61 (63.54)	18 (62.07)	0.999	1	0.885
Yes	35 (36.46)	11 (37.93)		1.065 (0.45 to 2.51)	
Abdominal surgery type, n (%)					
No	61 (63.54)	18 (62.07)	0.404	1	0.392
Appendectomy (Mcb)	3 (3.13)	2 (6.90)		2.259 (0.35 to 14.58)	
Appendectomy (Mcb) with C/S (Pfen)	20 (20.83)	4 (13.79)		0.677 (0.21 to 2.24)	
Low midline (TAH or c/s)	10 (10.42)	4 (13.79)		1.355 (0.38 to 4.84)	
TR	2 (2.08)	0		-	
Other	0	1(3.45)		-	
Adjuvant chemotherapy, n (%)					
No	29 (30.53)	12 (42.86)	0.224	1	0.227
Yes	66 (69.47)	16 (57.14)		0.586 (0.25 to 1.39)	
Neoadjuvant chemotherapy, n (%)					
No	92 (96.84)	28 (100)	0.999	-	-
Yes	3 (3.16)	0		-	
Antracyclin base, n (%)					
No	32 (34.78)	7 (25.93)	0.389	1	0.304
Yes	60 (65.22)	20 (74.07)		0.635 (0.26 to 1.51)	

Table 3. Cont.

variable	Non complication (n = 97)	Complication (n = 29)	p-value	OR (95% CI)	p-value
CMF, n (%)					
No	90 (96.77)	28 (100)	0.999	-	-
Yes	3 (3.23)	0		-	-
Taxane base, n (%)					
No	68 (73.12)	23 (82.14)	0.322	-	-
Yes	25 (26.88)	5 (17.86)		0.591 (0.20 to 1.72)	0.336
Gemcitabine, n (%)					
No	94 (100)	28 (100)	-	-	-
Yes	0	0		-	-
Vinorelbine, n (%)					
No	93 (98.94)	28 (100)	-	-	-
Yes	1 (1.06)	0		-	-
Xeloda, n (%)					
No	92 (97.87)	28 (100)	0.999	-	-
Yes	2 (2.13)	0		-	-
Adjuvant_hormonal treatment, n (%)					
No	32 (34.78)	7 (25.93)	0.389	1	
Yes	60 (65.22)	20 (74.07)		1.524 (0.58 to 3.98)	0.391
Tamoxifen, n (%)					
No	39 (42.39)	10 (37.04)	0.619	1	
Yes	53 (57.61)	17 (62.96)		1.251 (0.52 to 3.03)	0.620
Aromatase inhibitor, n (%)					
No	84 (91.30)	24 (88.89)	0.711	1	
Yes	8 (8.70)	3 (11.11)		1.312 (0.32 to 5.33)	0.704
Herceptin, n (%)					
No	88 (95.65)	25 (96.15)	0.999	1	
Yes	4 (4.35)	1 (3.85)		0.880 (0.09 to 8.23)	0.911

flap has always been questioned. Previous literature has found that adjuvant chemotherapy was associated with abdominal wall hernias and bulging⁽¹⁵⁾, however in our study, abdominal complication was not found to be associated with adjuvant chemotherapy regardless of type of chemotherapy given (Table 3). But this may be due to small number of the patients in both groups. This study also found no difference regarding abdominal wall bulging between the two techniques of abdominal wall closure. However there was no report of hernia in the 'new technique group'. This new technique has been reported with lower complication rate in abdominal hernia and bulging in a previous study⁽⁶⁾ and also show some superior in our series. But due to the small number of patients who underwent this new technique for abdominal muscle harvesting and closure, more patients should to be included in the study to conclude the superiority of the technique.

Conclusion

Transverse rectus abdominis myocutaneous flap reconstruction with whole muscle and partial sheath sparing shown in our study resulted in a total of 23% donor site complication rate. The majority of the complication was abdominal contour deformities for 21%. Bulging was report to be majority in abdominal contour deformities (85%) , the rest was hernia.

Although acceptable, the number of patients with abdominal wall bulging was still high comparing to previous study. And further analysis showed no relationship between obesity, bilateral flaps and adjuvant chemotherapy with the complication.

What is already known on this topic?

Donor site morbidity resulting from transverse rectus abdominis myocutaneous flap reconstruction (TRAM) influences the patients quality of life and is a

major concern to the surgeon. Many studies pointed out the importance of abdominal wall closure technique and many have been proposed to prevent donor site morbidities. However, no conclusion on the best technique has been made.

What this study adds?

The present study proposed incidence of abdominal wall bulging and hernia after TRAM reconstruction in breast cancer patients. Whole muscle and partial sheath sparing techniques used in the present study showed 23% complication which still high comparing to others. And in the present study also reported the risk factors of complications to be age greater than 40 years old. So, the present study supports that new technique for abdominal closure after TRAM reconstruction should be considered and more studies need to be done.

Potential conflicts of interest

None.

References

1. Hartrampf CR, Schefflan M, Black PW. Breast reconstruction with a transverse abdominal island flap. *Plast Reconstr Surg* 1982; 69: 216-25.
2. Momoh AO, Colakoglu S, Westvik TS, Curtis MS, Yueh JH, de Blacam C, et al. Analysis of complications and patient satisfaction in pedicled transverse rectus abdominis myocutaneous and deep inferior epigastric perforator flap breast reconstruction. *Ann Plast Surg* 2012; 69: 19-23.
3. Nahabedian MY, Manson PN. Contour abnormalities of the abdomen after transverse rectus abdominis muscle flap breast reconstruction: a multifactorial analysis. *Plast Reconstr Surg* 2002; 109: 81-7.
4. Kroll SS, Marchi M. Comparison of strategies for preventing abdominal-wall weakness after TRAM flap breast reconstruction. *Plast Reconstr Surg* 1992; 89: 1045-51.
5. Nahabedian MY, Dooley W, Singh N, Manson PN. Contour abnormalities of the abdomen after breast reconstruction with abdominal flaps: the role of muscle preservation. *Plast Reconstr Surg* 2002; 109: 91-101.
6. Rietjens M, De Lorenzi F, Andrea M, Petit JY, Chirappapha P, Hamza A, et al. Technique for Minimizing Donor-site Morbidity after Pedicled TRAM-Flap Breast Reconstruction: Outcomes by a Single Surgeon's Experience. *Plast Reconstr Surg Glob Open* 2015; 3: e476.
7. Kim EK, Eom JS, Ahn SH, Son BH, Lee TJ. Evolution of the pedicled TRAM flap: a prospective study of 500 consecutive cases by a single surgeon in Asian patients. *Ann Plast Surg* 2009; 63: 378-82.
8. Lee KT, Mun GH. Effects of obesity on postoperative complications after breast reconstruction using free muscle-sparing transverse rectus abdominis myocutaneous, deep inferior epigastric perforator, and superficial inferior epigastric artery flap: A systematic review and meta-analysis. *Ann Plast Surg* 2016; 76: 576-84.
9. Chirappapha P, Somintara O, Lertsithichai P, Kongdan Y, Supsamutchai C, Sukpanich R. Complications and oncologic outcomes of pedicled transverse rectus abdominis myocutaneous flap in breast cancer patients. *Gland Surg* 2016; 5: 405-15.
10. Ireton JE, Kluft JA, Ascherman JA. Unilateral and bilateral breast reconstruction with pedicled tram flaps: An outcomes analysis of 188 consecutive patients. *Plast Reconstr Surg Glob Open* 2013; 1: 1-7.
11. Vyas RM, Dickinson BP, Fastekjian JH, Watson JP, Dalio AL, Crisera CA. Risk factors for abdominal donor-site morbidity in free flap breast reconstruction. *Plast Reconstr Surg* 2008; 121: 1519-26.
12. Berrino P, Campora E, Leone S, Zappi L, Nicosia F, Santi P. The transverse rectus abdominis musculocutaneous flap for breast reconstruction in obese patients. *Ann Plast Surg* 1991; 27: 221-31.
13. Gabbay JS, Eby JB, Kulber DA. The midabdominal TRAM flap for breast reconstruction in morbidly obese patients. *Plast Reconstr Surg* 2005; 115: 764-70.
14. Paige KT, Bostwick J 3rd, Bried JT, Jones G. A comparison of morbidity from bilateral, unipedicled and unilateral, unipedicled TRAM flap breast reconstructions. *Plast Reconstr Surg* 1998; 101: 1819-27.
15. Patel SA, Sandberg LJ, Ranganath B, Devarajan K, Toto J, Topham NS. Impact of adjuvant chemotherapy on abdominal wall hernias and bulges after muscle-sparing free TRAM flaps for breast reconstruction. *Ann Plast Surg* 2014; 73: 62-7.

ภาวะแทรกซ้อนชนิดหนังหน้าท้องโป่งพองและหนังหน้าท้องมีรูโหว่หลังจากการผ่าตัดเพื่อนำไขมันและกล้ามเนื้อหน้าท้องมาเสริมสร้างเต้านมในผู้ป่วยมะเร็งเต้านมในโรงพยาบาลรามธิบดี

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ภูมิหลัง: การผ่าตัดเพื่อนำกล้ามเนื้อและไขมันหน้าท้อง (TRAM flap reconstruction) มาใช้เพื่อเสริมสร้างเต้านมหรือเพื่อปิดแผลหลังการผ่าตัดรักษามะเร็งเต้านม เป็นวิธีการที่ได้รับการยอมรับและใช้กันอย่างกว้างขวางในปัจจุบัน อย่างไรก็ตามภาวะแทรกซ้อนที่เกิดจากการสูญเสียกล้ามเนื้อหน้าท้องนั้นเป็นปัญหาที่สำคัญและส่งผลกระทบต่อคุณภาพชีวิตของคนไข้ในระยะยาว ในการศึกษาครั้งนี้เราจึงได้รายงานอัตราการเกิดผลแทรกซ้อนที่หน้าท้องหลังการผ่าตัดเพื่อนำกล้ามเนื้อและไขมันหน้าท้องเพื่อเสริมสร้างเต้านม รวมไปถึงภาวะที่เป็นปัจจัยเสี่ยงอันส่งผลต่อการเกิดผลแทรกซ้อนเหล่านี้ด้วย

วัตถุประสงค์: เพื่อศึกษาอัตราการเกิดผลแทรกซ้อนที่หน้าท้องหลังการผ่าตัดเพื่อนำกล้ามเนื้อและไขมันหน้าท้องเพื่อเสริมสร้างเต้านม และปัจจัยที่ส่งผลต่อการเกิดภาวะแทรกซ้อนเหล่านี้

วัสดุและวิธีการ: การศึกษานี้ทำโดยการรวบรวมข้อมูลย้อนหลังของผู้ป่วยที่เข้ารับการผ่าตัดเพื่อนำกล้ามเนื้อและไขมันหน้าท้องไปใช้ในการซ่อมแซมผนังอกหรือการเสริมสร้างเต้านมใหม่หลังการผ่าตัดเต้านมเพื่อรักษาโรคในช่วงเวลาตั้งแต่ เดือนมกราคม พ.ศ. 2551 ถึงเดือนธันวาคม พ.ศ. 2557 ที่โรงพยาบาลรามธิบดี และรวบรวมอัตราการเกิดผลแทรกซ้อนที่หน้าท้องของผู้ป่วยรวมถึงรายงานภาวะเสี่ยงที่น่าจะส่งผลต่อการเกิดภาวะแทรกซ้อนดังกล่าวไว้ด้วย นอกจากนี้ภาวะแทรกซ้อนที่เกิดขึ้นนั้นเราได้รายงานแยกตามเทคนิคการผ่าตัดที่ต่างกันในช่วงเวลาดังกล่าวด้วย

ผลการศึกษา: ผู้ป่วยที่เข้ารับการผ่าตัด 126 คน ในช่วงเวลาดังกล่าว เราพบภาวะแทรกซ้อนที่หน้าท้องหลังการผ่าตัดถึง 23 เปอร์เซ็นต์ ซึ่งสูงกว่าที่เขมามีการรวบรวมไว้ อย่างไรก็ตามภาวะแทรกซ้อนแบบที่พบมากที่สุดนั้นเป็นการโป่งนูนของหน้าท้อง โดยไม่พบรูโหว่ของผนังหน้าท้องซึ่งเราพบถึง 21 เปอร์เซ็นต์ จากรายงานของเราพบว่าปัจจัยเสี่ยงที่ทำให้เกิดภาวะนี้ได้แก่อายุที่มากขึ้น

สรุป: จากการศึกษาทำให้พบว่าอัตราการเกิดภาวะแทรกซ้อนที่หน้าท้องยังสูงมากและสัมพันธ์กับอายุที่มากขึ้น จึงมีความสำคัญอย่างยิ่งที่จะต้องมีการศึกษาเพื่อพัฒนาเทคนิคการผ่าตัดเพื่อลดภาวะแทรกซ้อนนี้ต่อไป
