Abdominal Wall Thickness Versus Body Mass Index As a Predictor of Complications after Abdominally-Based Free Flaps

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Introduction: Although BMI > 30 kg/m^2 is often considered a relative or absolute contraindication for abdominally-based free flaps, there is very little evidence in the literature that BMI correlates with complication rate. The purpose of this study was to determine whether BMI or Abdominal Wall Thickness at the Umbilicus (AWTU) correlated with post-operative complication rates.

Methods: A retrospective chart review was conducted on 151 patients who underwent abdominally-based free flap reconstruction after mastectomy at our institution. Pre-operative axial computed tomography scans were used to measure the distance from the skin surface to the abdominal wall at the umbilicus. The medical records of all 151 patients were then scanned for demographic data, medical history, BMI, surgical records, and post-operative complications. Mean BMI and mean AWTU were compared in those patients who had and had not experienced complications of any type, abdominal complications, and breast complications (unpaired t test). Mean AWTU was also compared between patients who had and had not experienced different subtypes of abdominal and breast complications (unpaired t test). Patients were then stratified into four groups based on AWTU, and complication rates were then compared between all four groups (Chi-squared).

Results: Average BMI did not differ significantly between patients who did or did not experience any complication, abdominal complications, or breast complications. Average AWTU was significantly higher in patients with overall complications and abdominal complications but did not differ significantly between those who did and did not experience overall breast complications. Patients with abdominal complications requiring re-operation, abdominal wound healing complications, and breast wound healing complications also had a higher average AWTU compared to those without these respective complications, but there was no significant difference between those who did and did not experience abdominal infectious complications, breast complications requiring re-operation, breast fat necrosis, or breast infectious complications. After stratification of complication rates based on AWTU groups, similar rates of abdominal complications were seen in the three lower AWTU groups, but the rate significantly increased in the group with the highest AWTU. Rates of

breast wound healing complications increased across the four groups in a linear fashion.

Conclusions: Abdominal wall thickness at the umbilicus is a better predictor of overall complications and abdominal donor site complications than BMI. AWTU can be used to predict rates of overall abdominal complications, abdominal complications requiring re-operation, abdominal wound healing complications, and breast wound healing complications.

Figure 1

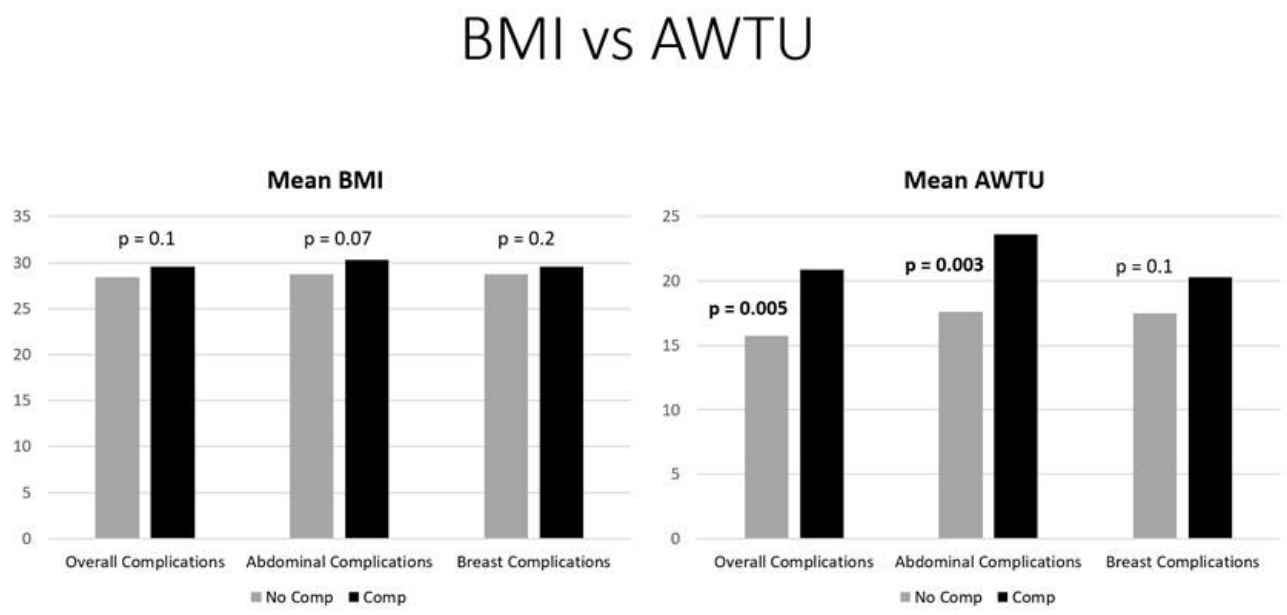


Figure 2

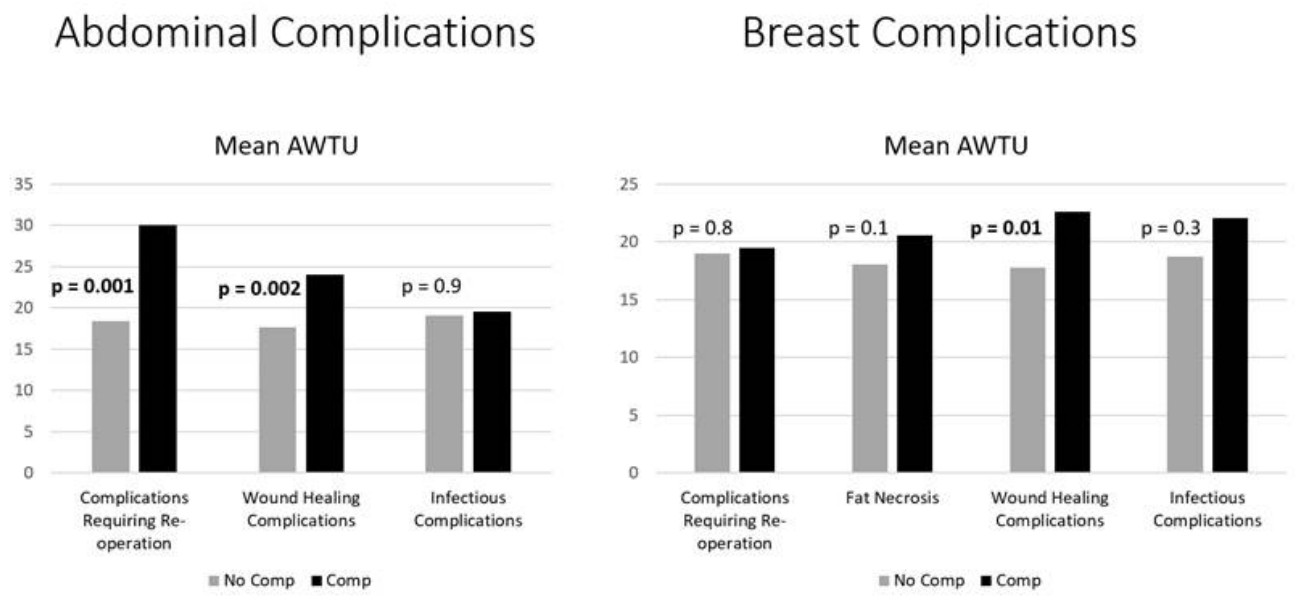
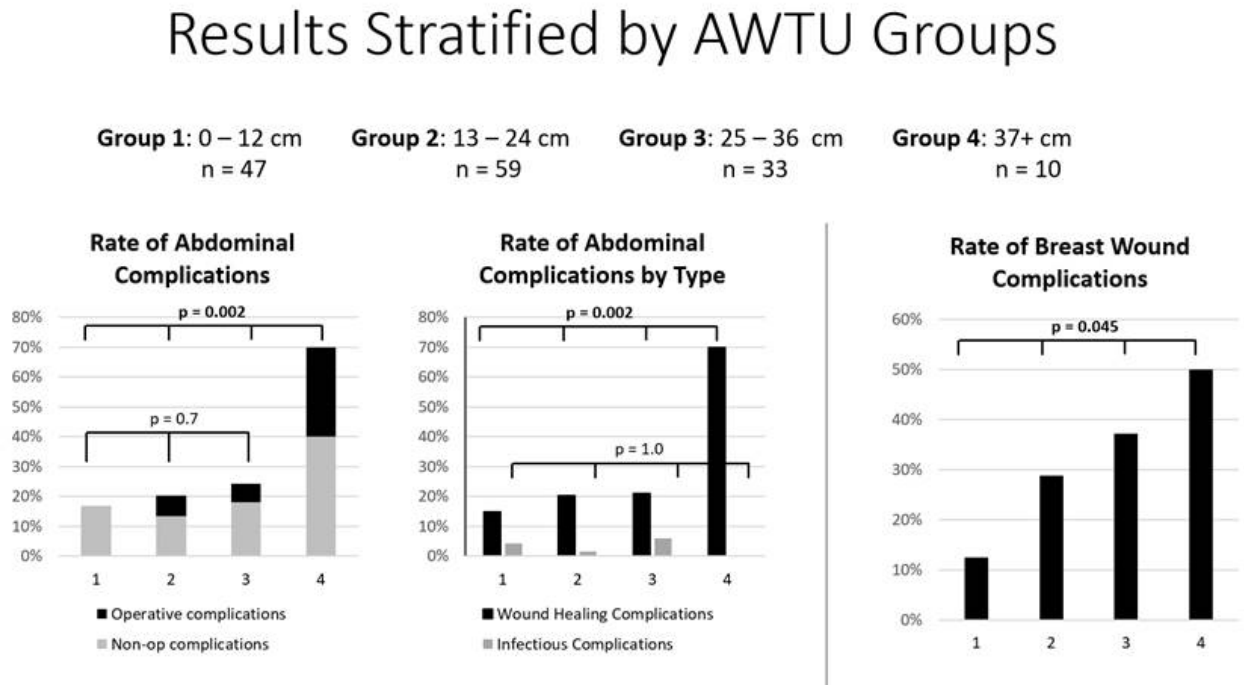

Abdominal Complications
Mean AWTU
35
30
25
20
15
10
5
0
p = 0.001
p = 0.002
p = 0.9
Complications Requiring Re-operation
Wound Healing Complications
Infectious Complications
No Comp
Comp
Breast Complications
Mean AWTU
25
20
15
10
5
0
p = 0.8
p = 0.1
p = 0.01
p = 0.3
Complications Requiring Re-operation
Fat Necrosis
Wound Healing Complications
Infectious Complications
No Comp
Comp

Figure 3


Results Stratified by AWTU Groups
Group 1: 0 – 12 cm
n = 47
Group 2: 13 – 24 cm
n = 59
Group 3: 25 – 36 cm
n = 33
Group 4: 37+ cm
n = 10
Rate of Abdominal Complications
80%
70%
60%
50%
40%
30%
20%
10%
0%
p = 0.002
p = 0.7
1
2
3
4
Operative complications
Non-op complications
Rate of Abdominal Complications by Type
p = 0.002
p = 1.0
Wound Healing Complications
Infectious Complications
Rate of Breast Wound Complications
60%
50%
40%
30%
20%
10%
0%
p = 0.045