



Post mastectomy complications are closely linked to high BMI in peri-operative period

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The authors state that there is no conflict of interests.

Abstract:

Background

Obesity is growing problem of modern era and so is breast cancer. We are getting better in early diagnostic and achieving major success in management of breast cancer from surgery to chemo- or radiotherapy. There are multiple factors that may influence the success of surgery and improve cosmetic result. Some elements can be well influenced by patients (body weight, smoking, etc.) and we have therefore decided to look into connection between BMI and post cancer mastectomy wound complications.

Methods

We have collected data of all mastectomies performed in breast cancer patients in our unit over 2 years. All mastectomies performed for cancer have been included in this study. We have included even mastectomies where is was more patients choice and not necessarily clinical indication. In all cases there was cancer confirmed on both – initial biopsy and final pathology.

Results

We have collected 174 patients in 2 years period, both males and females. From these patients, 90 of them were in the category of high BMI (over 25) and therefore classified as overweight/obese. In 13 patients, the information about perioperative BMI was missing.

There was in total 55 wound complications, from which 42 was linked to high BMI.

We have also looked into smoking and diabetic status of those patients to try and rule out some other elements that may affect wound healing. From 55 wound complications, only 7 were linked to active smokers, compared to 6 in ex-smoker category and 42 in non-smoker category. There were only 5 wound complications in diabetic patients. Remaining 50 were in non-diabetic patients.

Conclusion

This study showed that BMI over 25 is very likely causing high percentage of wound complications. This is surprising in comparison with smoking and diabetes. We hope that this may be starter for further discussion and new prospective studies.

I. Background

Being diagnosed breast cancer and going through mastectomy has enormous impact on patients' psychological status. Going through wound complication is one of the aspects that prevent people from moving forward, both towards chemo- or radiotherapy or getting on with their life.

Obesity is growing problem of modern era and so is breast cancer. We are getting better in early diagnostic and achieving major success in management of breast cancer from surgery to chemo- or radiotherapy. There are multiple factors that may influence the success of surgery and improve cosmetic result. Some elements can be well influenced by patients (body weight, smoking, etc.)¹ and we have therefore decided to look into connection between BMI and post cancer mastectomy wound complications.

II. Methods

Our breast unit in Portsmouth Queen Alexandra Hospital has large population area cover with cases over a year. This was retrospective study to determine relation of high BMI and post operative wound complications.

We have collected data of all mastectomies performed in breast cancer patients in our unit over 2 years. The inclusion criteria consist of all mastectomies performed for cancer in 2017 and 2018. There was a long discussion whether to include patients where mastectomy would not be first choice of clinician but patient opted for this option. We have included all mastectomies regardless of clinician first choice as long as there was active cancer in the breast and the aim was to remove this with surgery.

We have excluded patients who had initial chemotherapy as this might have contributed to the poor healing.

INCLUSION CRITERIA	Mastectomy performed for cancer
	Between 01/01/2017 and 31/12/2018
	Male and female patients
EXCLUSION CRITERIA	Primary chemotherapy

Table 1. shows inclusion and exclusion criteria

In all cases there was cancer confirmed on both – initial biopsy and final pathology.

The main aim was to look at the number of wound complications following mastectomies² and comparing this entity to perioperative data of body mass index (further mentioned only as BMI) to determine possible causality. We have used standardised NHS BMI calculator in perioperative period. The weight and height has been taken in pre-operative assessment if undertaken as face-to-face appointment or on the day of the operation. The maximum time difference between pre-operative assessment and date of operation was 14 days (CI95% 4 – 16 days) which allowed minimal difference to the actual weight on the day of surgery.

As a secondary aim, we have investigated relation of patients current/previous smoking status and diabetes status in relation to wound infection. The initial thought was that this would include or exclude those modalities as contributing factors towards wound infections.

III. Results

Over the period between 01/01/2017 to 31/12/2018 we have been able to collect 174 patients. Out of these 174 patients 172 were females and 2 were males. All patients from this group underwent mastectomies for breast cancer as a part of their treatment.

The group of total 174 patients has been further divided according to BMI into group A with BMI under 25 and group B with BMI 25 or over. Group B would according to BMI scoring system classify as overweight (for BMI 25-30) or obese (BMI 30 and over). In 13 patients the BMI or weight and height were not available.

BMI	TOTAL NUMBER (n=174) / %	
Bellow 18.5	5 / 3%	GROUP A (71 patients)
18.5 – 24.9	66 / 38 %	
25 – 29.9	47 / 27 %	GROUP B (90 patients)
30 and above	43 / 25 %	
No information available	13 / 7 %	

Table 2.shows BMI distribution in patient

Out of the 174 patients cases we have encountered 55 documented post operative wound complications. All of the patients attended their post operative follow up and these data have been available to us. The list of wound complications can be found in table bellow.

WOUND COMPLICATIONS	TOTAL NUMBER / % (n=55)
Abscess	2 / 3 %
Seroma	26 / 47 %
Superficial wound infection	7 / 14 %
Fat necrosis	8 / 16 %
Delayed healing	4 / 7 %
Cellulitis	2 / 3 %
Haematoma	2 / 3 %
Wound dehiscence	2 / 3 %
Lymphoedema	1 / 2 %
Rib pain	1 / 2 %

Table 3.shows wound complications distribution

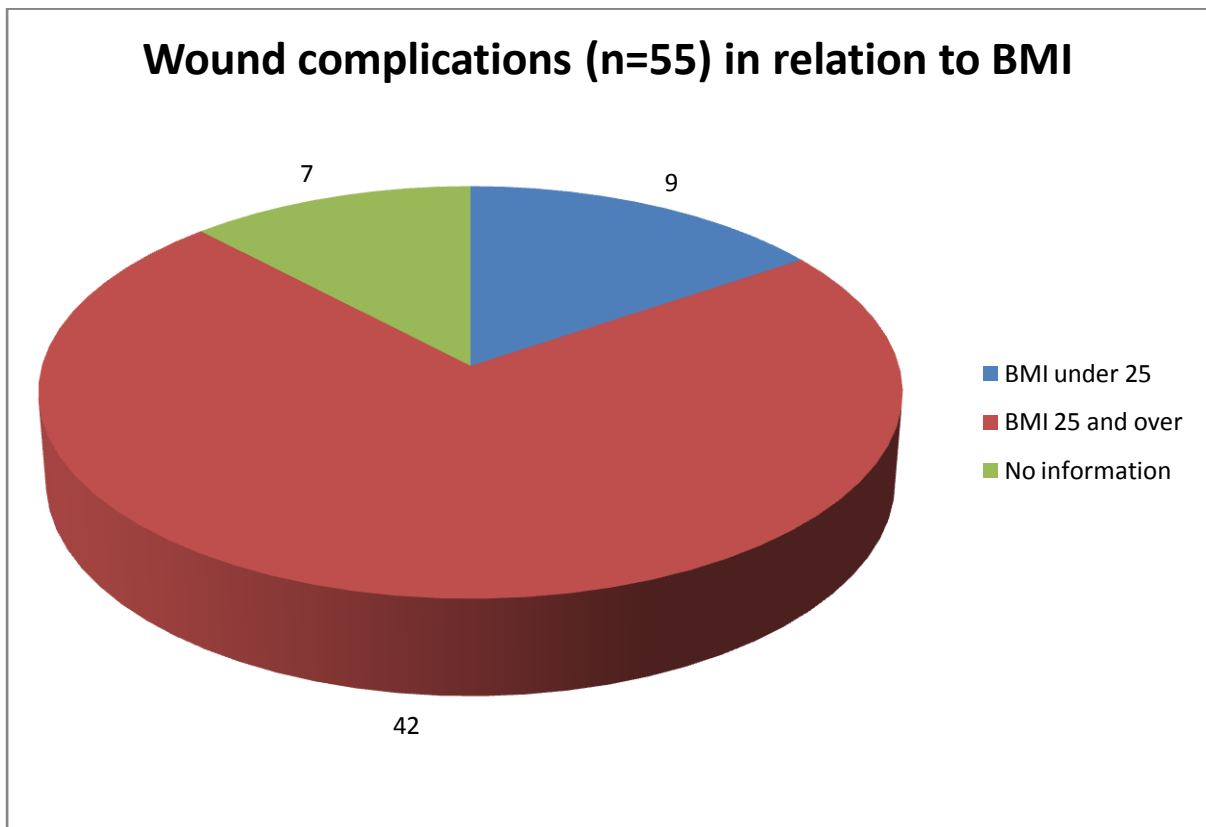
All superficial wound infections were covered with antibiotics. One abscess has been drained in theatre and one in clinic during follow up. 85% of seromas required aspiration in clinic, some of them on repetitively. One haematoma required return to theatre for drainage and inspection of the wound but no active bleeding point has been found.

Comparing the wound complications with BMI of the patients revealed that 42 cases (76%) of all wound complications occurred in patients from group B (BMI over 25). This means that almost every other patient in group B has suffered wound complications (46% patients in group B).

There were 4 documented complications (7% of all complications) in patients with no BMI or height/weight available.

WOUND COMPLICATIONS LINKED TO BMI	TOTAL NUMBER (n=55) / %
BMI under 25	9 / 16%
BMI 25 and over	42 / 76 %
No information about BMI available	4 / 8 %

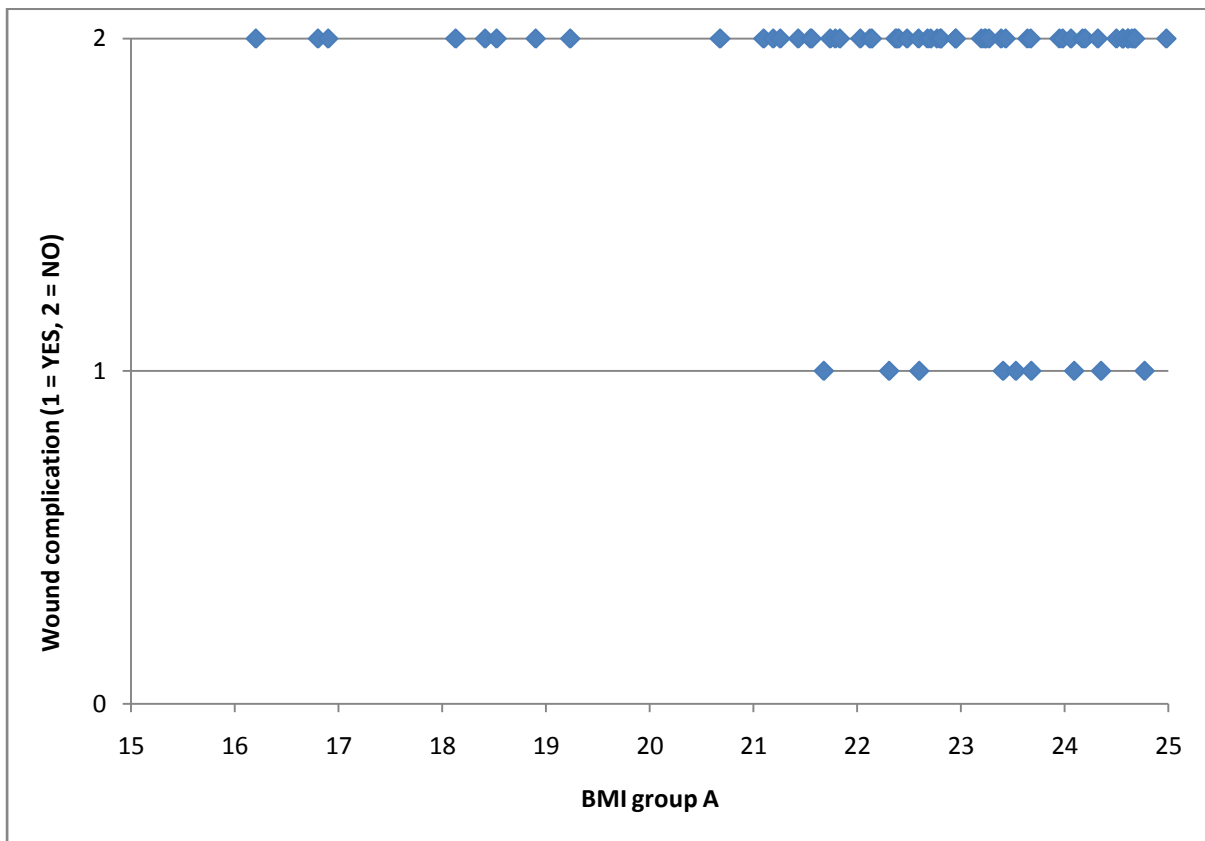
Table 4.shows distribution of wound complications according to BMI



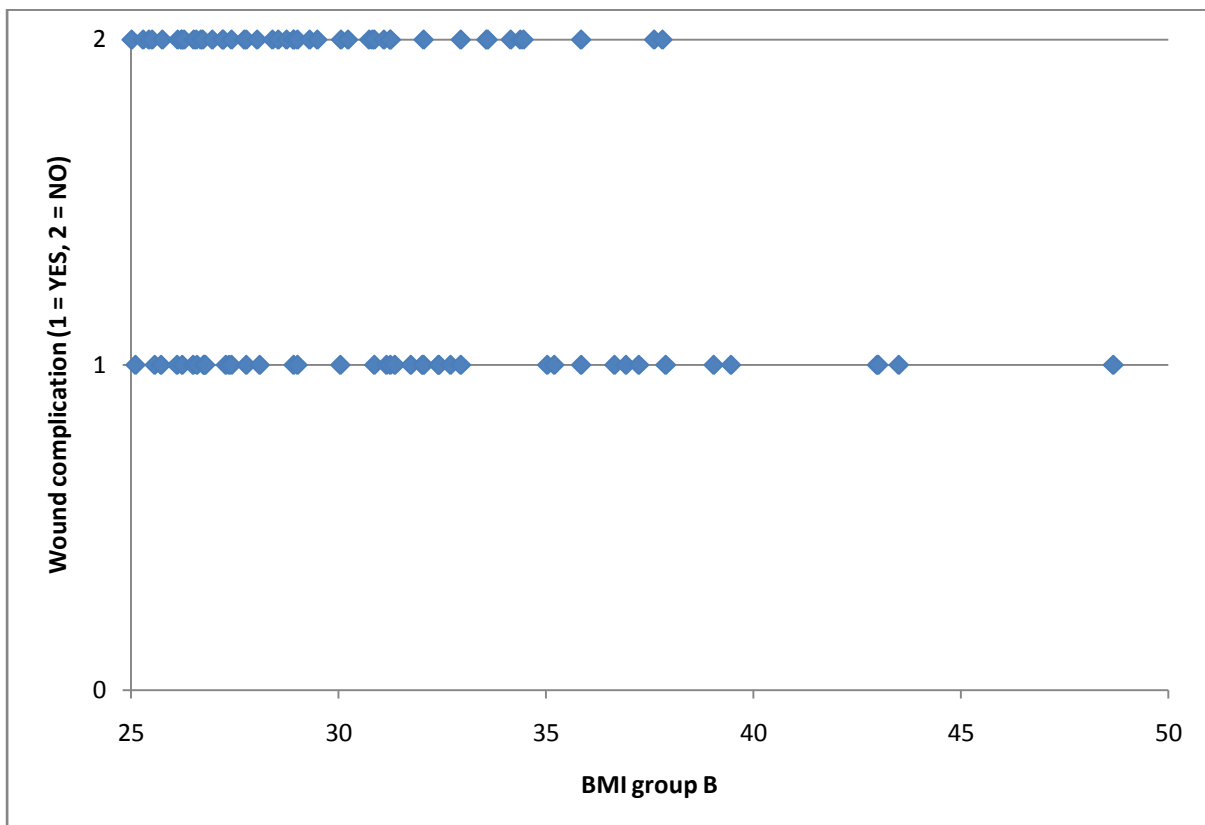
Graph 1.shows distribution of wound complications according to BMI

There were only 9 documented cases of wound complications in group A, which means that only 13% of patients in group A suffered wound complications compared to 46% in group B.

We have created graphs to demonstrate this correlation.



Graph 2.showsrelation of BMI and wound infection in group A.



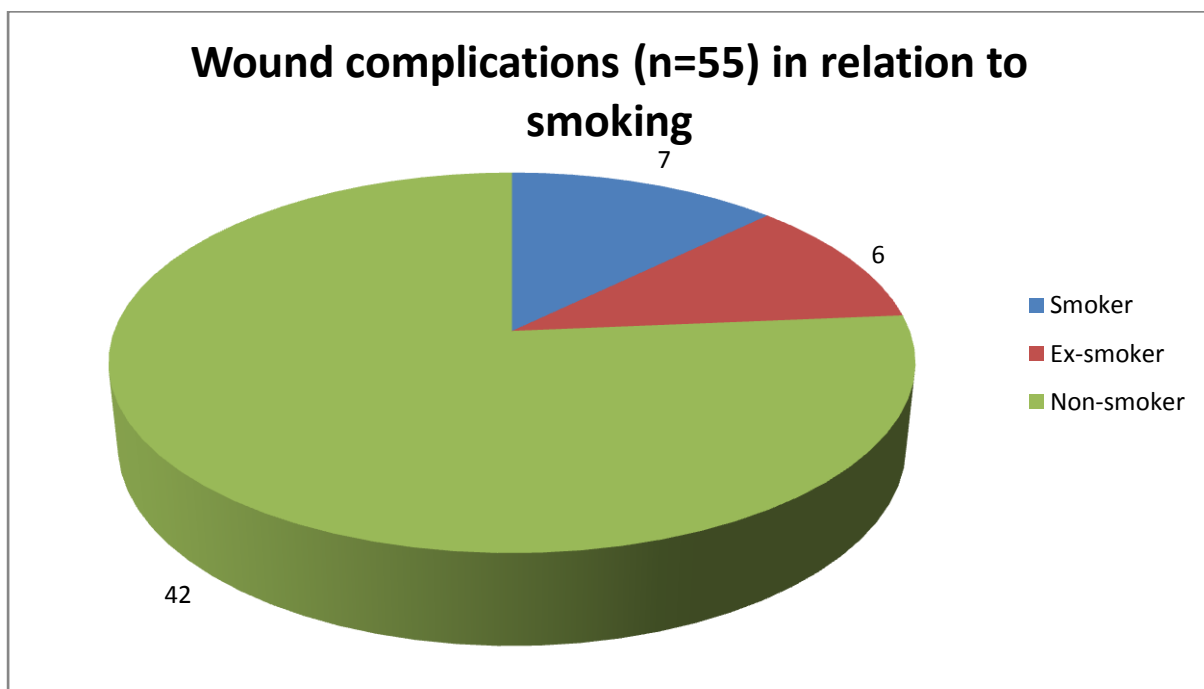
Graph 3.shows relation of BMI and wound infection in group B.

Similar approach has been taken while examining the relation of the smoking³ and diabetes⁴ to wound complications. From the total number of 55 wound complications, 7 (13%) occurred in the group of active smokers and 6 (11%) in group of ex-smokers. The vast majority of the wound complications 42 (76%) occurred in the group of non-smokers.

Very similar results have been achieved when examining the relation of diabetes and wound complications. Only 5 (9%) of wound complications occurred in patients with diabetes while 50(91%) of cases occurred in non-diabetic patients.

WOUND COMPLICATIONS LINKED TO SMOKING	TOTAL NUMBER (n=55) / %
Smoker	7 / 13 %
Non-smoker	42 / 76 %
Ex-smoker	6 / 11 %

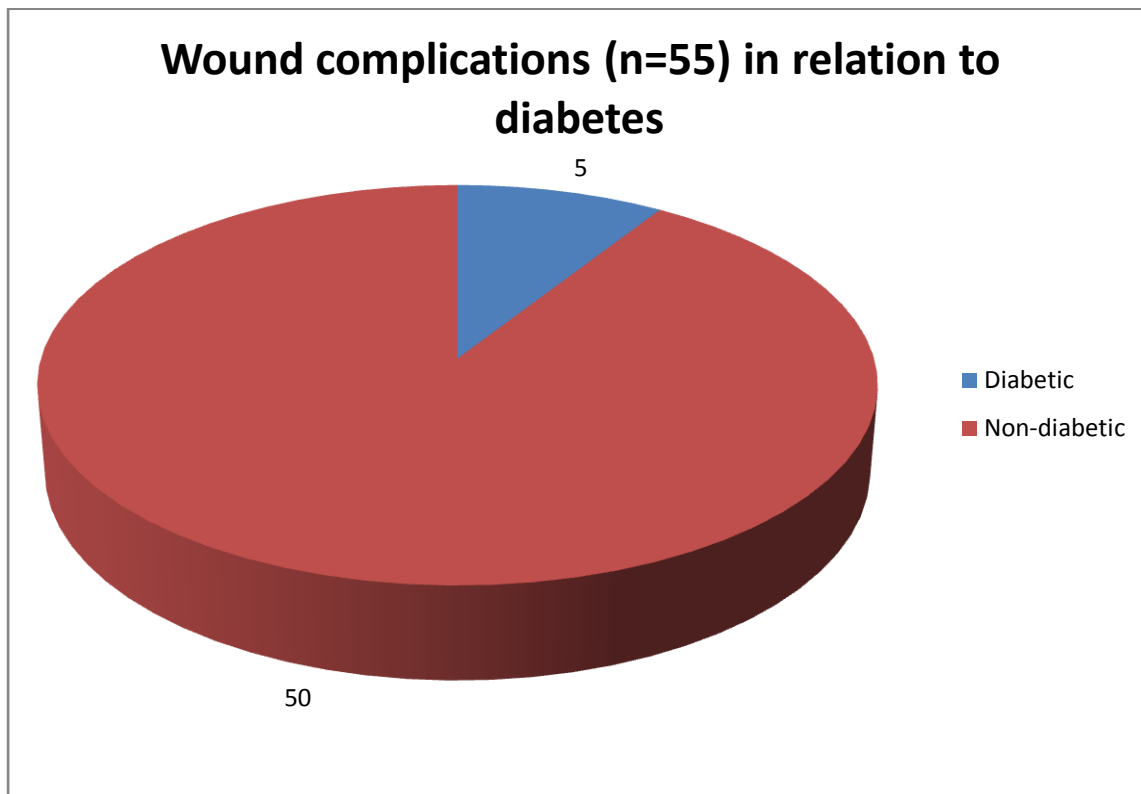
Table 5.shows distribution of wound complications according to smoking



Graph 4.shows distribution of wound complications according to smoking

WOUND COMPLICATIONS LINKED TO DIABETES	TOTAL NUMBER (n=55) / %
Diabetic	5 / 9 %
Non	50 / 91 %

Table 6.shows distribution of wound complications according to diabetes



Graph 5.shows distribution of wound complications according to diabetes

IV. Conclusion

This study showed that BMI over 25 has significant clinical influence on the outcome of the surgery. Almost half of the group B patients suffered some kind of wound infections comparing them to 13% of wound complications in group A. This result is significant and may have major impact on our future practice.^{5,6}

This study showed that BMI over 25 is very likely causing high percentage of wound complications. This is surprising in comparison with smoking and diabetes. We hope that this may be starter for further discussion and new prospective studies.

V. Discussion

These results proved the main aim of our study, that high BMI is one of the major contributing factor to wound complications and therefore in extent to the result of surgery. We understand that cancer treatment takes priority over life style changes and weight loss as these take long to establish. Although more knowledge about influenceble factors is needed to improve our patients outcome.

We have to admit that it was surprising comparing theseinformation to the results of complications with smoking and diabetes. These seem to have very minimal effect while the overweight/obesity status had proven to be clinically significant.

The question remains, how we can take these results into our day-to-day practice to try benefiting us and our patients. I believe that the answer lies with primary care and screening program. Showing to the public the benefits of life style changes may encourage and drive some changes to try and avoid complications in the future.

As clinicians we can try and implement these results into our practice by enclosing this information during the consent for operation. It can help as an aid for the clinicians and proof for the patients during this process.

We are aware that this study has its limitations mainly by being retrospective. I suggest prospective cohort study with multicentre approach would be beneficial to achieve higher number of patients.

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