

# A Single-Center Evaluation of Prophylactic Mastectomy Outcomes: Revisiting the Safety Profile and Risk Factors

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## BACKGROUND

Breast cancer represents a significant cause of morbidity and mortality in the United States and more women choose a proactive stance in preventing it.<sup>1</sup> Prophylactic mastectomy (PM) effectively minimizes the risk of breast cancer in high risk patients.<sup>2</sup> There has been an increase in the number of contralateral (CPM) and bilateral (BPM) prophylactic mastectomies during the last decade.<sup>1</sup>

This study aims to:

- Characterize the complication profile associated with PM;
- Compare CPM with therapeutic mastectomy (UM) and BPM complication rates;
- Identify risk factors for complications.

## METHODS

Patients:

- Women undergoing PM (CPM or BPM) at our institution from 2010 – 2015.

Complications:

- Categorized according to the Clavien-Dindo Classification of Surgical Complications.<sup>3</sup>
- Comparison CPM with UM and BPM.

Statistical analyses:

- Pearson's  $\chi^2$  test and Fisher's exact test.
- Univariate and multivariate analysis (binary logistic regression).

## RESULTS

- The overall complication rate was 16.3%; minor complications 15.1% and major 6.5%.
- CPM, UM ( $P=.821$ ) and BPM ( $P=.641$ ) complication rates were not significantly different.
- Risk factors for minor or major complications: age ( $\geq 65$ ), obesity, ASA class ( $\geq 3$ ), smoking, hypertension, anxiety, tissue expander (+ADM), and implant-only reconstructions.

## REFERENCES

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2. De La Peña-Salcedo JA, Soto-Miranda MA, Lopez-Salguero JF. Prophylactic mastectomy: Is it worth it? *Aesthetic Plast Surg*. 2012;36:140–8.
3. Dindo D, Demartines N, Clavien P-A. Classification of Surgical Complications. *Ann Surg*. 2004;240:205–13.

## RESULTS

### Complication Rates:

Table 1: Therapeutic versus Prophylactic Mastectomy & Contralateral versus Bilateral Prophylactic Mastectomy

|   | CPM vs. UM<br>P | UM<br>(n=272 breasts) |     | CPM<br>(n= 272 breasts) |     | BPM<br>(n= 158 breasts) |     | Overall PM<br>(n= 430 breasts) |     | CPM vs. BPM<br>P |
|---|-----------------|-----------------------|-----|-------------------------|-----|-------------------------|-----|--------------------------------|-----|------------------|
|   |                 | n (%)                 | n*  | n (%)                   | n*  | n (%)                   | n*  | n (%)                          | n*  |                  |
| <b>Minor complications (21)</b>             | .726            | 45 (16.5)             | 37  | 42 (15.4)               | 36  | 23 (14.6)               | 22  | 65 (15.1)                      | 58  | .805             |
| Breast hematoma                             | .752            | 6 (2.2)               | 5   | 4 (1.5)                 | 3   | 5 (3.2)                 | 5   | 9 (2.1)                        | 8   | .237             |
| Breast seroma                               | .857            | 17 (6.3)              | 10  | 16 (5.9)                | 11  | 8 (5.1)                 | 7   | 24 (5.6)                       | 18  | .721             |
| Breast infection                            | .406            | 22 (8.1)              | 20  | 17 (6.3)                | 17  | 11 (7)                  | 11  | 28 (6.5)                       | 28  | .773             |
| Other infection                             | .725            | 5 (1.8)               | 4   | 3 (1.1)                 | 3   | -                       | -   | 3 (0.7)                        | 3   |                  |
| Skin necrosis                               | .737            | 4 (1.5)               | 4   | 5 (1.8)                 | 5   | 6 (3.8)                 | 6   | 11 (2.6)                       | 11  | .215             |
| Abdominal hematoma                          | -               | -                     | -   | -                       | -   | -                       | -   | -                              | -   |                  |
| Post-discharge antibiotics                  | -               | -                     | -   | 13 (4.8)                | 13  | 10 (6.3)                | 10  | 23 (5.3)                       | 23  | .491             |
| <b>Major complications (21)</b>             | .707            | 14 (5.1)              | 13  | 16 (5.9)                | 15  | 12 (7.6)                | 12  | 28 (6.5)                       | 27  | .488             |
| (Minor complication requiring) <sup>1</sup> | .545            | 4 (1.5)               | 4   | 7 (2.6)                 | 6   | 4 (2.5)                 | 4   | 11 (2.6)                       | 10  | .979             |
| Reoperation                                 | -               | -                     | -   | -                       | -   | -                       | -   | -                              | -   |                  |
| <sup>1</sup> Readmission                    | -               | -                     | -   | 10 (3.7)                | 10  | 9 (5.7)                 | 9   | 19 (4.4)                       | 19  | .326             |
| Pulmonary embolism                          | -               | -                     | -   | -                       | -   | -                       | -   | -                              | -   |                  |
| Flap vascular insufficiency                 | .999            | 2 (0.7)               | 1   | 1 (0.4)                 | 1   | -                       | -   | 1 (0.2)                        | 1   |                  |
| Flap thrombosis                             | -               | -                     | -   | 1 (0.4)                 | 1   | 1 (0.6)                 | 1   | 2 (0.5)                        | 2   | .697             |
| Lymphedema                                  | .033            | 7 (2.6)               | 4   | 1 (0.4)                 | -   | -                       | -   | 1 (0.2)                        | -   |                  |
| <b>No complications</b>                     | .821            | 224 (82.4)            | 206 | 226 (83.1)              | 202 | 134 (84.8)              | 130 | 360 (83.7)                     | 331 | .641             |

\*: Underwent postmastectomy reconstruction

### Risk Factors:

On multivariate analysis age ( $\geq 65$ ), hypertension and tissue expander usage were predictive of minor complications. Anxiety and tissue expander usage were risk factors for breast seroma, whereas a normal BMI was protective. ASA class ( $\geq 3$ ), tissue expander (+ ADM) and implant-only reconstructions were risk factors for breast infections. Hypertension was the only risk factor for major complications in multivariate analysis. Significant risk factors for readmission were obesity, current smoking, and anxiety.

Table 2: Risk Factors for Minor and Major Complications

|                            | Risk factors:                           |  |                                      | Protective:                           |
|----------------------------|---|--|--------------------------------------|---------------------------------------|
| <b>Minor complications</b> | Age:<br>[3.15(1.26-7.88), .014]         | Hypertension:<br>[2.11(1.07-4.14), .031] | TE:<br>[2.42(1.06-5.54), .036]       |                                       |
| Breast seroma              | TE:<br>[3.37(1.01-11.27), .049]         | Anxiety:<br>[2.88(1.09-7.62), .034]      |                                      | Normal BMI:<br>[0.22(0.06-0.8), .021] |
| Breast infection           | ASA class:<br>[2.53(1.03-6.21), .043]   | Implants:<br>[4.45(1.5-13.26), .007]     | TE:<br>[4.76(1.47-15.38), .009]      | TE+ADM:<br>[7.02(1.71-28.72), .007]   |
| <b>Major complications</b> | Hypertension:<br>[2.93(1.2-7.15), .018] |  |                                      |                                       |
| Readmission                | Obesity:<br>[2.69(1.01-7.15), .047]     | Smoking:<br>[6.21(1.53-25.12), .010]     | Anxiety:<br>[3.86(1.41-10.57), .008] |                                       |

[Odds Ratio(95% Confidence Interval), P-value]. ADM: Acellular Dermal Matrix; ASA: American Society Anesthesiologists Physical Status; Normal Body Mass Index (BMI): 20-24.99 kg/m<sup>2</sup>; TE: Tissue Expander

## CONCLUSION

Prophylactic mastectomy in combination with reconstruction is becoming safer and more popular.<sup>2</sup> Our data suggest that autologous reconstructions result in fewer complications than other techniques. Careful preoperative patient selection and optimization of modifiable risk factors is important in improving outcomes.

*"I do not feel any less of a woman. I feel empowered that I made a strong choice that in no way diminishes my femininity."*

- Angelina Jolie after getting a double prophylactic mastectomy

