

## Original Article



# The Effect of Surgical Drainage on Seroma Incidence in Breast Cancer Surgery

Reza Eghdam Zamiri<sup>1,\*</sup> | Farshad Mahdavi<sup>2</sup><sup>1</sup>Assistant Professor of Surgery, Tuberculosis and Lung Disease Research Center, Tabriz University of Medical Sciences, Tabriz, Iran<sup>2</sup>Associate Professor of Radiology, Tuberculosis and Lung Disease Research Center, Tabriz University of Medical Sciences, Tabriz, Iran**Citation** R. Eghdam Zamiri, F. Mahdavi, **The Effect of Surgical Drainage on Seroma Incidence in Breast Cancer Surgery.** *Eurasian J. Sci. Technol.* 2023, 3(1):6-10. <https://doi.org/10.22034/ejst.2023.154025>

Received: 25 -09- 2022

Accepted: 02- 10- 2022

Available Online: 01 11- 2022

Checked for Plagiarism: Yes

Checked Language: Yes

**Keywords:**

Seroma, Breast Cancer, Surgery, Total, Partial

**ABSTRACT**

Because long-term drainage can cause problems such as limited mobility of the affected limb and pain in the patient's armpit, studies that can determine the effect of prolonged drainage on seroma incidence may lead to earlier drainage. And the reduction of the resulting complications should be helpful. Therefore, the present study was performed with the aim of the effect of surgical drainage on seroma incidence in breast cancer surgery. This descriptive cross-sectional study was performed during the years 2018 to 2020 with the participation of 152 patients after breast surgery in the hospitals of Tabriz University of Medical Sciences. Diagnosis of seroma after surgery (for one week) was made by a physician and the factors affecting its formation were collected in the data collection form. Data were compared by Chi-square test. The mean age of the study participants was 46 years; Tumor size in most participants was less than two centimeters; The stage of the disease was in the majority of participants I, II and in most of them the breast mass was completely removed. The surgical drain remained in the majority of participants for 5 to 9 days. The prevalence of seroma in this study was 35%; The results of this study showed that the type of surgical device, the number of days of drain use, as well as the stage of the disease and the type of surgery performed on the breast have no role in the incidence of seroma.

**Introduction**

Breast cancer is the most common cancer in women. Surgery is one of the main pillars in the treatment of this disease [1]. The types of surgery performed on these patients include

Breast Preservation and Modified Radical Mastectomy and complete removal of the breast with simultaneous reconstruction [2].

In order to determine the stage of the disease, it is necessary to take a sample from the axillary lymph nodes on the same side when removing breast tissue [3]. Manipulation of the axillary

\*Corresponding Author: Reza Eghdam Zamiri (reza.eghdamzamiri@yahoo.com)

lymphatic system may secrete lymph fluid at the surgical site, so a device called a drain is used to remove the discharge, which is removed by the surgeon a few days after the operation [4].

In some patients, after the drain is removed, the secretion and accumulation of this non-purulent fluid called seroma continues and causes problems for the patient [5]. Seroma is one of the most common surgical complications of breast cancer. The exact cause of seroma has not yet been determined. Numerous studies have been performed on possible risk factors for seroma [6]. Factors such as the type of surgery performed, bandaging the operation site, use of closed drainage at the operation site [7], duration of drainage at the operation site and type of surgical instrument (cuticle - surgical knife) have been studied in these studies [8]. There is disagreement among surgeons about the effect of surgical drainage time on seroma [9]. Some surgeons still keep the drain in the operating room longer to prevent seroma [10].

Because long-term drainage can cause problems such as limited mobility of the affected limb and pain in the patient's armpit, studies that can determine the effect of prolonged drainage on serum incidence may lead to earlier drainage. And the reduction of the resulting complications should be helpful. Therefore, the present study was performed with the aim of the effect of surgical drainage on seroma incidence in breast cancer surgery.

## Methods

**Study design:** This study is a cross-sectional and descriptive-analytical study in which 152 breast cancer patients who underwent surgery by surgeons at Tabriz University of Medical Sciences during 2018 to 2020 were studied. Were located. The sampling method was census and all patients were included in the study in the mentioned period by observing the inclusion and exclusion criteria.

**Inclusion and exclusion criteria:** Inclusion criteria included age over 18 years, candidate for breast surgery, removal of axillary lymph node groups and exclusion criteria also included: dissatisfaction with participation in the study,

body mass index above 40 and system disorders They were kidney and liver.

**Methods:** For all patients, axillary lymph node surgery was performed and two drains, one under the armpit and the other at the breast resection site, were placed. In the first group of patients, drains were removed before the fifth day after surgery, in the second group between the fifth and tenth days, and in the third group after ten days, and the three groups were compared. The data obtained from these patients were collected in a questionnaire that contained the variables of age, tumor size, stage of the disease, type of surgery, device used in surgery and time of last drain. Patients who had not undergone axillary lymph node surgery or had not used a drain during surgery were excluded from the study. In the classification of patients by age, due to the low prevalence of the disease in women less than 30 years, these patients were placed in a group. Patients older than 50 years were included in the group of elderly patients and the rest of the patients were placed in a separate group between the two groups. Tumor size was classified according to the TNM standard system. Patients with breast cancer are divided into four stages (I - IV) according to the size of the tumor, lymph node involvement and involvement of distant organs. In this study, in order to facilitate the work of patients in stage one and two in one group and patients in stage three and four in the second group. In terms of the type of surgery, patients were divided into two groups: conventional surgery, complete removal of the breast and removal of part of the breast. Considering that two surgical knives and a cutter are commonly used in breast surgery, the use of these two tools was considered as one of the independent variables. In terms of drainage time, patients were divided into three groups up to the fifth day after surgery, the fifth to tenth day and after the tenth day. Because some surgeons remove the drain on the second day after surgery and some keep it in place for at least ten days, patients agreed to be divided into these three groups according to the agreement of the relevant surgeons. In these patients, the diagnosis of seroma is based on clinical examination and the presence of fluid at the operation site within one

week of the last drain removed by the surgeon is considered as the occurrence of seroma.

**Data analysis:** The collected data were entered into the database using SPSS software version 20 and statistical analysis was performed by the same software. Descriptive statistics were used to classify the data and Chi-square test was used to compare the relationship between variables.

**Ethical considerations:** This study has been approved by the ethics committee of Tabriz University of Medical Sciences (IR.TBZMED.REC.1398.577); Informed and written consent was obtained from all patients and they were not charged for participating in the rejection study. All information was extracted from patients' records and finally confidentiality.

## Results

Based on the results of this study on 152 patients with breast cancer surgery in the hospitals of Tabriz University of Medical Sciences, seroma was developed in 35% of patients. The mean age of these patients was  $49.84 \pm 5.22$  years and 58% of them were in stage II disease. In 73% of patients, complete breast removal surgery was performed and in the rest of them, partial breast removal surgery was performed. Variables such as age, tumor size, disease stage, type of surgery, device used during surgery (cuticle-surgical knife) and time of last drain exit were examined. The relationship between the frequency of the studied variables in the two groups of patients with and without seroma is shown in Table 1.

**Table 1** Relationship between demographic and clinical variables with the incidence of seroma after surgery

Variable	Groups			P Value
	With seroma (N=53)	Without seroma(N=99)	Total	
<b>Age (Year)</b>	<30	12.5%	78.5%	0.251
	30-39	29.7%	70.3%	
	40-50	33.9%	66.1%	
	>50	43.1%	56.9%	
<b>Tumor Size (cm)</b>	<2	31.8%	68.2%	0.742
	2-5	38%	62%	
	>5	36.2%	63.8%	
<b>Staging</b>	I, II	63.7%	36.3%	0.415
	III, IV	35.7%	64.3%	
<b>Surgery Type</b>	Complete	38.7%	61.3%	0.091
	Partial	24.4%	75.6%	
<b>surgical instrument</b>	Surgical knife	32%	68%	0.159
	Cautery	36%	64%	
<b>Exit time of the last drain</b>	<5	32.5%	67.5%	0.479
	5-9	38.5%	61.5%	
	>10	28.6%	71.4%	

## Discussion

One of the mainstays of breast cancer treatment is surgery. Complete or partial removal of the breast, along with a biopsy of the axillary lymph nodes on the affected side, is a routine surgical procedure [11]. Seroma is one of the most common postoperative complications

in these patients [12]. This complication is characterized by the accumulation of non-purulent fluid at the operation site after the last drain is removed, which can be drained with a syringe [13]. Although this complication is not life-threatening for the patient, but it is effective in increasing the cost of treatment and delaying the patient's complementary treatments [14-

16]. The duration of site drainage is one of the factors that its role in the incidence of seroma is disputed by surgeons. Some surgeons believe that prolonged drainage reduces this complication, and some perform breast surgery without a drain. In the present study, a drain was placed at the site of surgery for all patients, but the drain time was different in them, according to which patients were divided into three groups. The results indicate that drain time has no clear effect on serum incidence [17-19]. Therefore, prolonged drainage did not play a role in reducing seroma. In this study, no relationship was found between other variables and the prevalence of seroma [20].

The results of a similar study indicate that prolonged drainage has no effect on reducing this complication and may cause the patient to be intolerant of drains. Our findings also show that there is no relationship between the duration of drainage and seroma formation. On the other hand, the results of another study indicate that the incidence of seroma is not affected by the duration of drainage. It can be said that early drainage does not increase wound complications, including seroma. At the same time, the patient can be discharged earlier than the hospital.

The results of a study show that in patients who remove the breast with a surgical knife, the drain cannot be used and, in these patients, the incidence of seroma was not significantly different from patients who had a drain. However, breast surgery without drains is still under study and needs to be further investigated in the future to be accepted by surgeons [16].

However, the results of the mentioned studies indicate that there is no agreement on the duration of drainage at the operation site. The results of this study indicate that the studied variables, including drainage time, had no effect on serum incidence and no statistically significant difference was observed in the three groups of patients. Therefore, according to the results of this study, it seems that long-term placement of the drain has no effect on reducing the incidence of seroma. Since some surgeons still keep patients in the hospital until the drain is drained, which increases patients' treatment

costs, the results of this study and similar studies can be effective in reducing these costs. This study can also be the basis for studies such as breast surgery without drainage, which if realized, will be a great help to patients in the recovery period after surgery.

### Limitations

One of the limitations of this study is the small sample size and although in such studies it is preferable to use a more limited number of surgeons and the same technique, but due to the small number of patients with breast cancer, we had to use multiple surgeons. However, due to the relative similarity of the surgical technique in these surgeons and also the almost similar distribution of surgeons among patients with and without seroma, the number of surgeons did not have a significant effect on the incidence of seroma compared to other studies. Obviously, a small sample size in this study necessitates the need for a design with a larger sample size. At the same time, by designing clinical trial studies, more definite results can be achieved in this field.

### Conclusion

The prevalence of seroma in this study was 35%; The results of this study showed that the type of surgical device, the number of days of drain use, as well as the stage of the disease and the type of surgery performed on the breast have no role in the incidence of seroma.

### References

- [1] J. van Bastelaar, L.L. Theunissen, M.G. Snoeijs, G.L. Beets, Y.L. Vissers, *Clin. Breast Cancer*, **2017**, *17*, 316–321 [[crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [2] M.K. Gol, D. Aghamohamadi, *Int. J. Women's Health and Reprod. Sci.*, **2020**, *8*, 73-78 [[crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [3] J. van Bastelaar, A. Beckers, M. Snoeijs, G. Beets, Y. Vissers, *World J. Surg. Oncol.*, **2016**, *8*, 66 [[crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [4] J. van Bastelaar, L.L.B. Theunissen, M.G.J. Snoeijs, G.L. Beets, Y.L.J. Vissers, *Clin. Breast*

- Cancer*, **2017**, *17*, 316–321 [[crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [5] C. Eichler, P. Fischer, A. Sauerwald, F. Dahdouh, M. Warm, *Breast Cancer*, **2016**, *23*, 486–490 [[crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [6] P. Covarelli, F. Barberini, D. Cannavici, R. Cirocchi, A. Rulli, C. Boselli, V. De Giorgi, *Minerva Chir.*, **2020**, *75*, 111–116 [[crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [7] W.P. Weber, C. Tausch, S. Hayoz, M.K. Fehr, K. Ribi, H. Hawle, J.E. Lupatsch, K. Matter-Walstra, F. Chiesa, K.J. Dedes, G. Berclaz, *Ann. Surg. Oncol.*, **2018**, *25*, 2632–2640 [[crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [8] A. Fawzy, A. Gaber, A.A.M. Farid, *Int. Surg. J.*, **2017**, *4*, 2103–2109 [[crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [9] K. Vasileiadou, C. Kosmidis, G. Anthimidis, S. Miliaras, I. Kostopoulos, E. Fahantidis, *Clin. Breast Cancer*, **2017**, *17*, 595–600 [[crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [10] F. Ebner, A. Schramm, D. Bottke, T.W. Friedl, T. Wiegel, V. Fink, K. Lato, I. Bekes, W. Janni, N. de Gregorio, *Arch. Gynecol. Obstet.*, **2016**, *294*, 861–866 [[crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [11] H. Headon, U. Wazir, A. Kasem, K. Mokbel, *Mol. Clin. Oncol.*, **2016**, *4*, 863–867 [[crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [12] F. Ebner, A. Wöckel, W. Janni, R. Kreienberg, L. Schwentner, M. Wischnewsky J. *Cancer Res. Clin. Oncol.*, **2017**, *143*, 1823–1831 [[crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [13] K. Seretis, D. Goulis, E.C. Demiri, E.G. Lykoudis, *Aesthetic. Surg. J.*, **2017**, *37*, 316–323 [[crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [14] J. Winocour, V. Gupta, J.R. Ramirez, R.B. Shack, J.C. Grotting, K.K. Higdon, *Plast. Reconstr. Surg.*, **2015**, *136*, 597e–606e [[crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [15] J.W. Fernandes, R. Damin, M.V.N. Holzmann, G.G.O. Ribas, *Rev. Col. Bras. Cir.*, **2018**, *45*, e1394 [[crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [16] R.J. Restifo, *Aesthet. Surg. J.*, **2019**, *39*, 966–976 [[crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [17] Raziani Y., Othman BS., 2021, 10: 5 [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [18] S Ghorbanizadeh S., Raziani Y., Amraei M., Heydarian M., 2021, 12:54 [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [19] Y Raziani Y., Othman BS., Raziani S., 69, 102739 [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [20] Raziani Y., Raziani S., 2021, 3:83 [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]