

# No drains in reduction mammoplasty – a systematic review

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## Summary

Breast reduction mammoplasty is the only effective therapeutic intervention for patients with symptomatic breast hypertrophy. In this procedure, closed suction drains have become a standard of care, while the literature supporting use of drains is lacking. In fact, with emerging data we found out that drains might not be so necessary. This review aimed to systematically compare the number of complications in drained and undrained breasts and to evaluate the safety of omitting drains in reduction mammoplasty in clinical practice. A systematic review of literature was conducted identifying all studies on drainage in reduction mammoplasty. The analysed databases revealed 13 eligible studies to be included in this review. There were 308 drained breasts and 859 undrained breasts in total in patients from 16 to 73 years of age. The resected tissue weight per side fluctuated from 108 to 1,296 grams. In total, there was only 2.4% incidence of haematoma complications in undrained breasts and 3.9% in drained breasts. Closed suction drains are still being routinely used in reduction mammoplasty, although aborting drain use is proven to be not only safe, but advantageous. The clear benefit is increased patient comfort, shortened hospital stay, decreased cost of the procedure and nurse care, and decreased rate of complications.

## Key words

breast reduction – mammoplasty – drains – preoperative complication – surgical haemorrhage

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## Introduction

Breast reduction mammoplasty is one of the most common surgical procedures performed in plastic surgery. This procedure was proven effective in increasing the quality of life of patients [1]. During the surgery, excessive parenchyma is removed, the nipple is repositioned, and the skin is tailored to fit the new reshaped breast. Numerous techniques for volume reduction were developed while creating a pleasing breast shape that preferably preserves sensation and function. To maximise both functional and aesthetic results, the surgical approach is chosen individually to suit all patients [2].

Use of suction drains used to be an integral part of most of the plastic surgery procedures [3]. However, with emerging data, we recently found that drains might not be as necessary as we

thought. Moreover, their use might slow down patients' recovery and bring more disadvantages than benefits.

In this article, we aimed to perform a systematic review of the available literature concerning drain usage and its actual outcomes to find out if it is really necessary to use drains in breast reduction procedures in our practice.

## Assessment of the issues

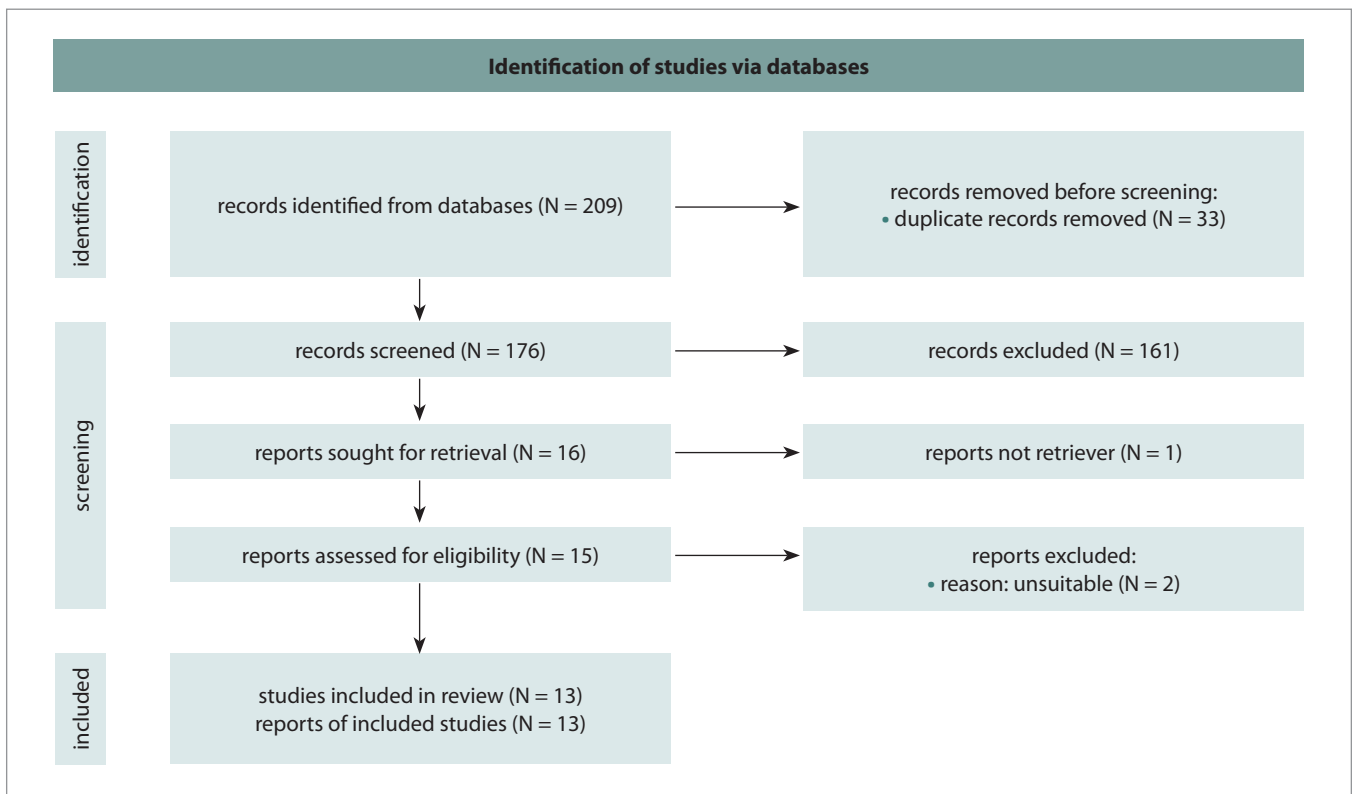
### Methods

A systematic review of literature in PubMed, Scopus, and Ovid MEDLINE databases was conducted according to the PRISMA statement and its guidelines from August 2023 to select all studies on drainage in breast reduction mammoplasty to determine the non-essentiality of drain usage in routine procedures. The search algorithm of articles was "breast reduction" and "drain." Other re-

views and duplicates found in searched databases were removed. The relevance to the topic of all articles was manually verified.

### Study selection

The analysed databases revealed a total number of 176 studies after ruling out duplicates. Based on the title and abstract, 155 of those studies were excluded because of their irrelevance to the topic. Another 6 were removed since they were not studies, but reviews. A single study could not be retrieved and therefore the full text could not be reviewed. Two more studies were excluded for being unsuitable to the goals of this review after reviewing the full text. The process of systematic reviewing resulted in including 13 eligible reports in this review. The details of the search strategy are shown in the PRISMA flow diagram (Scheme 1) [4].



**Scheme 1.** PRISMA flow diagram showing the process of database searching for studies eligible for the purpose of this review.

### Study characteristics

Thirteen studies on drainage in breast reduction mammoplasty were reviewed. Two of the included articles were published in French, the rest in English. Four studies were retrospective, three of those were using no drains for a consecutive number of patients, and a single study compared two groups of patients, a drained and an undrained group. Another four were prospective studies, two of which were randomly draining one breast and the other one was left undrained, which made the patient act as their own control, a single study was using no drains for a consecutive number of patients, and a remaining study focused on randomisation into drained and undrained groups perioperatively. The approach that the last study chose allowed comparison of the duration of hospital stay between the two groups, which were significantly different in favour of the undrained group, meaning allowing early discharge. For the drained

group, the mean number of days of the hospital stay was 2.62 days, while it was only 1.85 days for the undrained group. A single article was a guideline summary on reduction mammoplasty by the American Society of Plastic Surgeons, and two articles were papers on reduction mammoplasty by the American Board of Plastic Surgery, which were all in favour of no draining. A single study was a statistical analysis of practice patterns using drains amongst surgeons in the United Kingdom and Ireland. There was a total number of 211 surgeons who participated in this study by submitting a survey, 151 of which routinely used drains in reduction mammoplasty, making it 71.6% of the studied population. As a limitation of this study, it is noted that less than half of the addressed population returned the survey, which could in theory mean that only surgeons who are using drains in reduction mammoplasty completed the survey.

### Studied group characteristics

The total number of operated breasts ranged from 98 to 368 in different studies in this review. Patients' ages ranged from 16 to 73 years. The resected tissue weight from each breast ranged from 108 to 1,296 grams. In four of the studies, the technique of the inferior pedicle was used; in three studies, the superior pedicle was used; another three studies used the superomedial pedicle; two studies mentioned free nipple graft as a solution for a small number of patients; and one study used the vertical scar technique.

### Operating techniques

Local infiltration with anaesthetics and epinephrine was applied in three studies; in a single study, corticosteroids were used together with local anaesthetics and epinephrine; in five studies, patients were perioperatively covered by broad-spectrum intravenous antibiotics; and in one of those five, oral antibiotics

were prescribed to be taken after the procedure as well.

### Complications

Complications documented in analysed studies were haematoma, seroma, abscess and surgical-site infection, wound dehiscence in the T-junction of the Wise pattern, and partial nipple loss either due to haematoma compression or due to too much tension. The drained group consisted of a total number of 308 breasts; the undrained group contained 859 breasts.

After comparing data from reviewed studies, three studies said there was no significant difference between complication rate of the drained and undrained groups and one study rated it as significantly lower for the undrained group. The most frequent complication was wound dehiscence with a total number of 54 cases, of which 24 were from the undrained group. All were treated locally and are unrelated to drain application. There were 33 haematoma cases, of which 21 were from the undrained group, making it only 2.4% from the total number of undrained breasts compared with the remaining 12 haematoma cases of the drained group, which was 3.9%. These numbers support the statement that drains do not prevent haematomas. There were 26 cases of infections and abscesses, 11 of which were from the undrained group. All were treated with oral antibiotics uneventfully. Throughout all studies, 16 partial areolar necroses were documented, 7 of those were from the undrained group, and one case was not caused by haematoma compression, but due to sutures under too much tension. There were also 15 steatonecrosis cases, 8 of which were from the undrained group, and 12 seromas with 8 from the undrained group, which were aspirated as an outpatient procedure.

### Discussion

Breast reduction mammoplasty is an effective solution in patients with sympto-

matic hypertrophic breasts in improving aesthetic, functional, and psychological issues [5]. Symptomatic breast hypertrophy is considered a medical condition for which the only therapeutic intervention is reduction mammoplasty, given the lack of effective nonsurgical solutions. Symptomatic breast hypertrophy is defined as a syndrome combined of persistent neck and shoulder pain, tendency towards dorsal kyphosis, shoulder grooving caused by brassiere straps bearing the weight of overly heavy breasts, intertriginous rash of the inframammary folds, recurrent episodes of headaches and back pains, and upper limb peripheral neuropathies. It is usually seen as symmetric hypertrophy of both breasts, but it can manifest itself as unilateral asymmetry; it can even occur after undergoing mastectomy of the opposite side [6].

Closed suction drainage has become the standard of care after reduction mammoplasty because it is said to reduce fluid collection and minimise dead space between tissues [7]. Nevertheless, it has been proven that drains do not prevent the formation of haematomas [8], lead to no difference in wound healing complications, and put the patient in a possible risk of infection due to the communication between deep tissues and the skin surface [9]. Drain site infection spreads either as cellulitis or retrogradely into the wound in the parenchyma of the breast along the drain or through the wound that the drain leaves behind after its removal. Generally said, the longer the drain is in situ, the higher the possibility for it to cause problems [8]. Another disadvantage of drains is the fact that for its insertion there is a need for an extra stab incision, which leaves an ugly and unwanted scar [10]. Additionally, following a planned or more likely a traumatic drain removal, bleeding could be initiated leading to formation of a haematoma [8]. Also, more intensive nursing care is required when drains are used,

hospital stay is longer, and the overall financial cost of the procedure is significantly higher [11]. In addition to all these disadvantages, patients prefer no drains because of increased comfort, less pain [12], and no additional scarring. This results in no long-term differences between drained and undrained breasts [3].

Moreover, if there is nothing in the literature to support routine drain usage, then it might be beneficial to eliminate it completely [13]. In the era of evidence-based medicine, scientific evidence must be incorporated into clinical practice of surgeons because there is already overwhelming evidence against drain use in breast reduction mammoplasty, and failing to do so puts patients at unnecessary and unwanted risk [14]. Therefore, we suggest that there should be careful consideration whether to use drains in a routine procedure because "No drainage is better than the ignorant employment of it." Halstead 1893 [8].

### Conclusion

Studies used in this review show that reduction mammoplasty is safe when closed suction drainage is applied. However, aborting the use of drains has been proven not only safe, but overall beneficial. There are some clear advantages to it, such as no increase in the complication rate. Moreover, patients are in favour of the absence of drains due to improved comfort, shortened hospital stay, and overall lower cost of the procedure. In conclusion, we believe that insertion of drains specifically in breast reduction mammoplasty should be reconsidered since there were no significant differences between drained and undrained breasts in terms of local complications or long-term global results.

### Roles of authors

Study design and data assessment – A. Dušková, O. Měšťák;  
wrote the manuscript – A. Dušková;  
critical manuscript revision – A. Dušková, O. Měšťák, M. Molitor.

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