

**Methods of Closure of Mastectomy Wound to Improve Outcome**

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**Abstract**

**Background:**

Mastectomy remains one of the methods of surgical treatment for breast cancer. It is major operation that carries multiple risks for wound healing. The right closure technique remains crucial not only to create good cosmetic results but also to provide ground for future treatment or reconstruction.

**Main text:**

I have reviewed multiple studies looking at the post operative complications (mainly seroma formations) from different closure perspective. I have also compared these studies with personal experience in our breast unit. There is still high seroma incidence in our breast unit and by looking through current evidence, we were hoping to adjust our technique to improve patients' outcome.

**Conclusion:**

There is no standard for closure of mastectomy wound. Exploring the possibilities of other studies, it remains obvious, that closure is mainly at discretion of surgeon's abilities and preferences. There are retrospective studies that showed that closure of death space can significantly reduce the amount of seromas and complications related to them.

**Discussion:**

Closure of death space remains one of the key elements of reducing seroma and other complications. There are only few prospective studies but more trials are planned or ongoing in near future

**Background**

Despite improvement in breast screening and early detection of breast cancer progress in surgery and oncology medicine, mastectomy remains common surgical management of breast cancer.

The operation itself is major surgery with multiple recognised risk factors.<sup>1</sup> The general issue as in any cancer patient is impaired healing. The main problem remains in the basic of this operation itself as it created large rough surface and leaves relatively thin skin and subcutaneous tissue coverage.

Formation of seroma is well recognised and very common risks of mastectomy operation. It is reasonably harmless complication on its own but can have major effect on delay of wound healing and therefore delay potential further oncological treatment. It may also have effect on reconstruction surgery.

**Main text**

Our breast unit has excellent results in removal of breast cancer in timely manner. The issue remains with post mastectomy seromas where the incidence is high. This is despite usage of the conventional technique and drain for majority of mastectomies in our trust.

I have reviewed multiple studies looking at different technique of mastectomy closure taking into account the post operative complications (mainly seroma formation). The reason to perform this literature search and provide this summary was to explore other documented technique and their success to try and improve our outcome.

Mastectomy wound is large, crossing almost half of patients’ body and the outcome of healing can have effect on further management of patient.<sup>2</sup> The formation of seroma and not very good cosmetic result may cause major psychological complications in patients who have already been dealing with cancer diagnosis.<sup>3</sup>

Data collected in our unit

I have collected data from patients in our unit who underwent mastectomy for cancer between 2016 and 2017. Out of the 174 patients we have collected, there was 55 (31%) documented cases of wound complications. Out of the 55 cases, 26 (47% of all complications) were seromas. The rest of the included abscess, wound infection, delayed healing and dehiscence. (Tab 1) According to our oncology department majority of these complications had or would have had effect on delay of further treatment.

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 %

Although the method of closure of mastectomy wound is not set up, in our unit the technique is pretty consistent using conventional closure with drain placement. Bellow is the most common technique used in our practice (Tab 2).

LAYER OF SKINS	SUTURE USED
	drain placement
subcutaneous fat tissue	vicryl – interrupted sutures
skin	monocryl or vicryl rapid continuous suture

Literature review:

I do appreciate that the wound complications are multifactorial and therefore difficult to address. The purpose of review was to establish whether there is any surgical technique that has shown significantly better results just by changing the closure method.

Several factors are accountable for formation of seroma including use of electrocautery, extensive dissection in breast surgery and the extent of axillary lymph node involvement.<sup>4</sup>

There were many publications mainly in the last 15 years with focus on surgical prevention of seroma formation and other risks factors. All these studies have taken main interest in reduction of death space as successful prevention of seroma formation.<sup>5</sup>

The main three options for closure of death space are:

- a) suction drain
- b) quilting of the skin flaps
- c) adhesive tissue glue to skin flaps<sup>6</sup>

There is no single technique that would prove to be superior to others and therefore is very difficult to establish consensus. In 2010 American Journal of Surgery presented randomized controlled trial looking into seroma formation comparing lymphatic vessel ligation and death space closure. Even the outcome of this randomized controlled trial was inconclusive and due to authors it was difficult to distinguish whether either or both techniques had major effect on reduction of seroma formation.<sup>7</sup>

Unfortunately large proportion of studies available is retrospective. Across majority of them, the general recommendation is that mechanical closure of death space leads to significant reduction of post mastectomy seroma. Most of these studies are prioritizing quilting of the skin flaps over other methods.<sup>8,9,10</sup>

In 2017 Clinical Breast Cancer Journal published prospective randomized controlled trial which showed that using quilting sutures for flap fixation reduces seroma formation significantly.<sup>11</sup>

There is now new multi centre double blind randomized controlled trial ongoing. Its study protocol has been published in 2018 in BMC Cancer journal. The name of the trial is SAM (Seroma reduction After Mastectomy) and its aim is to evaluate flap fixation after mastectomy using sutures or tissue glue versus conventional closure.<sup>12</sup>

### **Conclusion**

There is no standard for closure of mastectomy wound. Exploring the possibilities of other studies, it remains obvious, that closure is mainly at discretion of surgeon's abilities and preferences. There are retrospective studies that showed that closure of death space can significantly reduce the amount of seromas and complications related to them.

The main issue lies with reduction of death space after mastectomy and traditional quilting of the skin flaps has proven effective way to reduce seroma formation. As I said earlier seroma formation is multifactorial and therefore is unlikely that we will be able to prevent this in near future.

### **Discussion**

Reviewing multiple retrospective studies showed that reduction of death space post mastectomy is going to reduce seroma formation and potential aspiration. Until now, only one prospective study has been published which showed significant reduction of seroma after flap fixation with quilting sutures. Mechanical fixation of skin flap has proven beneficial in all mastectomy cases regardless of axillary clearance.<sup>11</sup>

There is some other study being conducted at France looking into effectiveness of quilting to close death space post mastectomy. Unfortunately this study has not been blinded on surgical or patient side regarding surgical technique used and therefore there will be a lot of biases.<sup>13</sup>

I am very interested to see the results of proposed SAM study as it is a first study to evaluate the effect of flap fixation and its sequelae. It will look into seroma aspirations, number of out patient clinic visits, infection, shoulder function, patient assessed cosmesis, quality of life and cost-effectiveness) in a double-blind randomized controlled trial.<sup>12</sup>

As there is no consensus of the best technique to use, it remains at surgeon discretion. Although I am aware that seromas and other wound complications are multifactorial, I will consider mechanical fixation of the skin flaps for reduction of death space and monitor the outcomes.

**References:**

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