

Original Research Article

# A comprehensive study on the effect of injection methylprednisolone in post mastectomy seroma

S Vijayalakshmi\*

Associate Professor, Department of General Surgery, Govt. Villupuram Medical College, Chennai, Tamil Nadu, India

\*Corresponding author email: [sriramchristopher@gmail.com](mailto:sriramchristopher@gmail.com)

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## Abstract

**Background:** Seroma formation is a common problem after mastectomy. The incidence varies between 30% to 92%. It is often an ongoing problem after removal of the suction drain, and repeated skin puncture is necessary to remove the seroma. In addition to many ambulatory visits this also leads to an increased risk of infection, and the adjuvant treatment can be delayed for several weeks. Different procedures have been tried to avoid seroma formation. Among these are for examples: immobilisation of the arm and shoulder after mastectomy, different drain regimens, closing of the dead space of the cavity, different chemical substances as thrombin, tranexamic acid and fibrin. None of these results has been successful. Seroma formation is most likely the result of the inflammatory response due to wound healing. In the seroma fluid several factors have been detected that support this assumption. These factors are: high levels of IgG, leucocytes, granulocytes, proteinases, proteinases inhibitors, different kinds of cytokines (tPA, uPA, uPAR, PAI-1, PAI-2, IL-6 og IL-1). On the basis of this, an inhibition of the inflammatory response might result in a decrease of seroma formation, and perhaps improve quality of life after mastectomy. Steroids inhibit the inflammatory response for example by inhibition of the cytokine function. It has been shown that a high single dose of steroid infusion (30 mg/kg solu-medrol) inhibits the normal IL 6 response after colon resection. Newer studies have shown that even at a lower dose the inflammatory response is inhibited. In several studies of head and neck surgery the oedema in surgical area is reduced after a single dose of 125 mg solumedrol. It is precisely this effect of reduced fluid formation we want to obtain in our study. We have therefore chosen to use a single dose of 125 mg of solumedrol in this study. Even at the largest single dose of glucocorticoids there have not been seen any increasing in surgical complications.

**Aim:** The aim of this study was to study the effect of injection methylprednisolone in post mastectomy seroma in patients coming to Govt. Villupuram Hospital.

**Materials and methods:** This was a prospective study consisting of 20 patients diagnosed as carcinoma breast who underwent modified radical mastectomy in our institution. With all aseptic precautions, 125 mg methylprednisolone sodium succinate intravenously as a single bolus before the start of surgery in patients undergoing modified radical mastectomy in case group.

**Results:** Most common age group was 41-50 years of age. In 2 cases seroma aspiration was present.

**Conclusion:** Since Seroma formation is the most common complication of Mastectomy and among the methods used to reduce its incidence, steroid administration seems to be the most cost effective and shows promising results. Its routine use in every case is recommended under good antibiotic cover and wound care.

### Key words

Modified radical mastectomy, Seroma, Methyl prednisolone.

### Introduction

Seroma is defined as a serous fluid collection that develops under the skin flaps during mastectomy or in the axillary dead space after axillary dissection which usually begins to develop on the seventh post-operative day, reaches a peak on the eighth day and slows continuously until the sixteenth day when it generally resolves. It ends up in prolonged hospitalization and outpatient follow-up, further adding to the miseries of the breast cancer patients and may also delay subsequent adjuvant therapies. There are various techniques in research and practice reported to prevent or diminish seroma formation, but no single method has been shown to be constantly and reliably effective. These methods include external compression dressing, immobilization of the arm, excessive use of the electric scalpel compared to ligature of the lymphatic branches, fibrin glue application, number of drains and the type of suction (high or low pressure) applied. It is proposed that thorough attention applied to techniques of the surgery itself; to reduce the leakage from dissected vessels and lymphatics and to obliterate the dead space may reduce the incidence of seroma formation. Use of electrocautery, ultrasonic dissection, harmonic or laser scalpel and other techniques like drains, sealants and sclerotherapy may also be used but their usefulness and cost effectiveness are debatable. Surgical technique of obliterating dead space

using flap fixation or quilting has been introduced with promising results. Some drugs have also been used which have shown efficacy in reducing seroma fluid for example betaglucan. In a controlled pilot study by Okholm, it was tested whether a single dose of glucocorticoid (methyl prednisolone succinate) given intravenously 1.5 hours preoperatively was effective against seroma formation after mastectomy and axillary dissection. The drainage volume during the first two postoperative days, total seroma volume during days 1-5 and the number of seroma punctures were reduced, but not significantly. The number of seroma punctures and the seroma volume was half that of the control group during the first 69 days postoperatively. There were no differences in wound healing time or rate of infectious complications between the groups. As it is proven by literature that seroma formation is by far the most common complication after mastectomy leading to increased morbidity, psychological trauma, increased length and cost of treatment and flap fixation is a promising method for preventing seroma formation. This will not only provide enhanced recovery and satisfaction to patients undergoing mastectomy but also reduce hospital stay, cost of treatment and use of antibiotics.

### Materials and methods

This was a prospective study consisting of 20 patients diagnosed as carcinoma breast who underwent modified radical mastectomy in our institution. With all aseptic precautions, 125 mg methylprednisolone sodium succinate intravenously as a single bolus before the start of surgery in patients undergoing modified radical mastectomy in case group.

### Inclusion criteria

- Women with primary breast cancer, undergoing a mastectomy with either sentinel node biopsy or complete axillary dissection.

### Exclusion criteria

- Men
- Treatment with glucocorticoids within the last month before surgery, including inhalation products.
- Pregnant.
- Not able to speak Danish.
- Severe heart disease.
- Treatment with carbamazepine, phenytoin, phenobarbital, rifampicin, salicylates and ciclosporin.
- Uremia.
- Diabetes.
- Other medical conditions, evaluated by the investigator, that make the patient unfit for participation.
- Previous psychosis.
- Immunocompromised patients who have an indolent course.

### Methodology

- Patients who were admitted in our hospital with primary breast cancer were included.
- A detailed history taking and clinical examination were done.
- Patients included in the study underwent a mastectomy with either sentinel node biopsy or complete axillary dissection.
- With all aseptic precautions, 125 mg methylprednisolone sodium succinate intravenously as a single bolus before the

start of surgery in patients undergoing modified radical mastectomy in case group.

- The clinical profile of the patients was noted.
- Result was tabulated and analyzed.

### Results

This observational study was done in patients admitted in Department of General Surgery, Villupuram Medical College. **Table - 1** documents the age distribution of the patients taken for the study. **Table - 2** shows Effect on post mastectomy seroma

**Table – 1:** Age distribution.

Age group (Years)	Case	Control
<20	0	0
21-30	0	0
31-40	1	1
41-50	4	6
51-60	3	2
61-70	2	1
>71	0	0

**Table - 2:** Effect on post mastectomy seroma.

	Case	Control
Drain output >100 ml in till POD-3	3	7
Seroma aspiration	2	8

### Discussion

Seroma formation is by far the most common complication following breast surgery and the abundance of literature regarding various methods of its prevention is evidence enough that no single method is fully effective in its prevention. Although still under research the pathogenesis of seroma formation has been associated with several precipitating factors. Once dissection occurs, a dead space is created which is filled with serous fluid. This fluid then alters composition in the days following surgery. At first it resembles lymph with blood clots, indicating broken lymph and blood vessels due to the dissection [1, 2]. A few days later it

transforms into an exudate, as the body reacts to the acute inflammatory condition following surgery. As the patient resumes moving her arm, lymphatic and blood vessels which are damaged by the dissection start oozing blood and lymph, which adds to the seroma. Therefore, the pathophysiology for seroma formation seems to be multifactorial with surgery as its trigger. Steroids being anti-inflammatory drugs are thus an ideal candidate to be studied in preventing seroma formation which is patho-physiologically speaking; an inflammatory process [3]. Axelsson studied local injection of methyl prednisolone acetate versus saline in the mastectomy cavity at the time of drain removal while Taghizadeh, et al. studied patients who underwent latissimus dorsi reconstruction after mastectomy by randomizing them to either triamcinolone or saline in the cavity at the initial seroma puncture. Qvamme G carried out a double blind randomized controlled intervention study of a single dose of 80 mg methylprednisolone versus saline on seroma formation after mastectomy. The authors observed a statistically significant reduction in the number of punctures, total seroma volume and the duration of seroma production [4, 5]. Turel, et al. applied the same technique on a rat model by injecting 30 mg/kg methylprednisolone sodium succinate into the potential space beneath the skin flaps following Mastectomy and axillary lymph node dissection after 7<sup>th</sup> day of mastectomy, the seroma volumes were noted. In our study, we found that injecting 120 mg of Depomedrol i/v one hour before surgery was a convenient mode of application, which helped decrease the average drain output and also decreased the days for which drainage was needed. This intervention also reduced the total incidence of seromas on 3<sup>rd</sup> post-operative day as compared to the nonintervention group (i.e., 18% vs 6%) [6]. The only fact that needs consideration is the slightly higher incidence of wound infection (3% vs 9%) with steroid administration; this can be overcome with appropriate pre-operative antibiotics at intervention and post operatively. Reduction in total drainage days adds to patient comfort as well as reduces the demand for analgesia

moreover the drain itself is also a source of infection.

## Conclusion

Since Seroma formation is the most common complication of Mastectomy and among the methods used to reduce its incidence, steroid administration seems to be the most cost effective and shows promising results. Its routine use in every case is recommended under good antibiotic cover and wound care [7].

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