

Post Abdominoplasty Seroma Reduction with Fibrin Sealant Use

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ABSTRACT

Seroma formation is a common postoperative complication in the field of plastic and reconstructive surgery, resulting in significant patient morbidity. The incidence of seromas is particularly high in abdominoplasty where it is reported to occur in 10% to 57% of the patients [3].

INTRODUCTION

The origin of post-abdominoplasty seroma fluid is not well understood, and studies on its cause and composition are scarce. The name serum (Latin for "whey") and oma (root for "tumor"), meaning "tumor from the collection of serum" [4].

Fibrin glue (FG) is used to control bleeding, to adhere tissues together, and to seal tissue defects. FG is prepared from platelet-rich plasma or by mixing concentrated fibrinogen solutions with thrombin. Concentrated fibrinogen solutions are produced by cryoprecipitation or by chemical precipitation of plasma [4].

In this study we compared the difference in post abdominoplasty results using the fibrin glue and without using it. 40 patients were divided in two groups, 20 patients in each group, abdominoplasty was done using the fibrin sealant in the first group and traditional abdominoplasty was done without using the fibrin sealant in the second group.

We compared the amount of the fluid collected in the drains and the period needed for drain removal and compared the rate of complications. Our results showed superior effect of fibrin glue for reduction of post abdominoplasty seroma with higher efficacy.

PATIENTS AND METHODS

• *Inclusion criteria:* Patients included in this study were between 30-50 years of age, their BMI was between 25-35kg/m², and patients complaining of presence of redundant fatty apron.

• *Exclusion criteria:* patient's age below 20 or above 50 years are excluded BMI below 25 kg/m², or above 35 kg/m², were excluded. Other patients were excluded if smokers or presence of chronic illness as DM or hypertension or abnormalities in liver or kidney functions and bleeding tendency.

The study was done in Fayoum University from February 2008 to June 2010 by the authors.

Twenty patients were divided in two groups:

Group I: Abdominoplasty was done using the fibrin sealant.

Group II: Traditional abdominoplasty was done without using the fibrin sealant.

The collected data included: Age, sex, height, the weight, Body Mass Index (BMI), previous abdominal surgery, weight of resected apron, amount secreted in the drains (drainage total) and, time needed for drains removal, occurrence of complications, tobacco use.

Abdominoplasty was done by the authors for resection of an abdominal fatty apron in patients with good general condition.

In all cases standard abdominoplasties were performed including the marking under general anesthesia with elevation of abdominal flaps just above the muscles and resection of the redundant part. In group II, after completing the resection of the lower redundant part of the abdominal flap and positioning the umbilicus, the sealant spray was applied while an assistant held each side of the abdominal flap (Fig. 1). The flap was brought down, compression applied for five minutes over the abdominal flap (Fig. 2). Final skin closure was completed at the end of the compression period. Small 1/4 inch suction drain was left at each end of the skin closure.

The fibrin glue obtained by mixing 10cc of cryoprecipitate from the hospital blood bank and 1ml. of activated thrombin mixed together for 30 seconds and sprayed on the abdominal wall.

Concentrated fibrinogen solutions are produced by cryoprecipitation (Fig. 3 a,b) or by chemical precipitation of plasma.

Post operative the amount of fluids collected in the drains are measured every 12h until the drains are removed. The need for post operative stay at home is evaluated. The re-examination period amounted 12 weeks. The presence of seroma was evaluated by the use of ultrasound and the appearance of a sonographic provable liquid aggregation after distance of the drainages was evaluated as a seroma.

Age and BMI of the patients are presented in Tables (1 & 2).

Table (1)

Age	Group I	Group II
Mean	38.6	40.2
From 20-25	0	1
From 25-30	2	2
From 30-35	4	3
From 35-40	6	4
From 40-45	4	6
From 45-50	2	3
Above 50	2	1

Table (2)

BMI	Group I	Group II
Mean	32.6	32.9
BMI 25-27	2	3
BMI 27-29	3	2
BMI 29-31	3	2
BMI 31-33	8	8
BMI 33-35	4	5



Fig. (1): Spraying the fibrin glue.



Fig. (2): Compression on the abdominal flap.



Fig. (3a): Cryoprecipitate is used after cross matching.



Fig. (3b): Equipments used for preparation of fibrin glue.

RESULTS

Drains outcome in both groups in first 3 days:

Our results indicated a reduction in seroma formation and decreased drain output. Drains were removed an average of 3 days post operative in experimental groups with the fibrin glue use in

comparison with the traditional way in which the drain was removed after 5 to 6 days (Table 3).

Regarding complications, rate was less in the first group including hematoma formation in one case in the first group and seroma in one case, on the otherhand there was seroma formation in 4 cases in the second group and wound dehiscence in 2 cases (Table 4).

Table (3)

Mean drain output	Group I	Group II
Drain 1 st 12h	73	164
Drain 2 nd 12h	42	112
Drain 3 rd 12h	35	105
Drain 4 th 12h	34	92
Drain 5 th 12h	30	71
Drain 6 th 12h	27	59
Total in drains	241	603

Table (4)

Complications	Group I	Group II
Hematoma	1	0
Seroma	1	4
Wound dehiscence	0	2

DISCUSSION

Estimates of incidences of seroma vary from 1% to 57%, with an accepted standard of 10%. Usually, it is a self-limited phenomenon, but occasionally it may cause significant problems [7].

Many trials were done to reduce the incidence of seroma following abdominoplasty as adequate placement of drains and leaving them in place until the drainage decreases to less than 50cc/day is recommended, complete bed rest after the operation. Elastic compression garments and the use of quilting sutures during surgery described by Baroudi R., et al. [1] and fibrin glue have also been used to prevent this problem.

The higher incidence rates are reported in obese patients, in men, and when liposuction is performed in addition to the surgery. Since fibrin sealants have been reported to decrease the incidence of seromas and hematomas in various types of surgery, extending its use to plastic surgery procedures known to have these problems, is reasonable [6].

Norma C., et al. tried to reduce the incidence of seromas in abdominoplasty we evaluated the use of a commercial fibrin sealant (Tisseel, Baxter Corporation, Deerfield, IL) in a clinical study. Ninety-one patients underwent abdominoplasty performed by one surgeon, and the potential benefit of using a fibrin sealant was analyzed. Patients were randomized prior to surgery into one of two groups: In group I (n=43) the sealant was not used, and in group II (n=48) the aerosolized sealant was used.

The results of the study demonstrated that the groups were not significantly different in mean age (39 Vs. 40), body mass index (26 Vs. 26), and amount of tissue removed (990 grams Vs. 928

grams). Prolonged drainage and seromas, however, were significantly reduced by use of the fibrin sealant.

Burt M., et al. tried the use of fibrin sealant on 72 patients evenly divided into three groups was studied. An aerosol sealant (Tisseel: Baxter) and a topical viscous sealant were (Vitigel: Orthovita) was compared against controls and came with the following results: Their results indicated a (1) reduction in seroma formation; (2) decreased drain output with a statistical (p -value <0.05); (3) no difference in aerosol versus topical applications (Table 5) Drains were removed an average of two days earlier in experimental groups [2].

Table (5)

Complications	Group I (Control)	Group II (Tisseel)
Drainage > 3 days	30%	5%
Seroma/Hematoma	19%	4%

(Norma C., et.al., 2005.)

Our results showed superior effect of fibrin glue for reduction of post abdominoplasty seroma with higher efficacy.

Conclusion:

We recommend fibrin sealant as an adjunct in abdominoplasty leading to remarkable decrease in rate of seroma formation and earlier drain removal by one week than the traditional method and discuss future studies and applications in plastic surgery.

The use of fibrin glue is a safe and simple procedure and has a low cost that can solve the problem of seroma formation in abdominoplasty patients but it increased the risk of small haematoma formation due to increasing the clotting of blood in the dead space and also it may lead to obstruction of the drains and blood clotting in them so continuous care and observation of the drains should be done.

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