



Case report

No-drain mastectomy – Preventing seroma using TissuGlu®: A small case series

Christian Eichler^{a,*}, Faten Dahdouh^a, Petra Fischer^a, Mathias Warm^b^a Department of Gynecology and Obstetrics, Holweide Hospital, Cologne, Germany^b Department of Health, University of Witten/Herdecke, Witten, Germany

ARTICLE INFO

Article history:

Received 7 May 2014

Received in revised form

13 July 2014

Accepted 19 July 2014

Keywords:

Breast cancer

Mastectomy

Seroma

Prevention

TissuGlu

No-drain

ABSTRACT

Introduction: Post-mastectomy seroma, with an occurrence of up to 59%, is a major complication in modern oncological surgery. While drain placement is a common tool in dealing with this complication, some patients may either be incapable or unwilling to accept this course of action, requiring an alternative option for seroma prevention. A recent study using a lysine-derived urethane adhesive named TissuGlu® has shown promising results in mastectomy patients.

Case presentation: We used TissuGlu® in three patients who could not have a post-operative drain after mastectomy due to a variety of reasons. Standard mastectomy protocols were followed. Two no-drain mastectomy patients did not show any post-operative seroma formation (cases 1 and 2), while a third patient had to be aspirated twice at two (180 ml) and four weeks (60 ml) post-surgery. No complications such as hematoma, wound dehiscence or adverse reactions to the adhesive were observed. Patient satisfaction with the no-drain situation was high as post-surgical discomfort was minimal.

Conclusion: Although one patient developed small amounts of seroma, TissuGlu® may present an additional option in the high risk, no-drain post-mastectomy scenario.

© 2014 The Authors. Published by Elsevier Ltd on behalf of Surgical Associates Ltd. This is an open access article under the CC BY-NC-SA license (<http://creativecommons.org/licenses/by-nc-sa/3.0/>).

1. Introduction

Post-mastectomy seroma is a major complication in modern oncological surgery [1,2]. The most common approach in preventing seroma is the placement of surgical drains within the wound area. Some patients however, are either incapable or unwilling to accept this course of action. This requires an alternative preventive measure for post-operative fluid accumulation.

While a plethora of literature is available on the benefits of post-surgical drain placement, due to seroma formation in up to 59% [1], some authors argue that drain placement may not be necessary at all [3]. While this debate is ongoing, alternative options must be offered to patients who are incapable or unwilling to accept post-surgical drainage. This is especially true because risk factors such as previous surgeries, radiation treatment, chemotherapy, smoking habits, increased age and obesity [4–7] cannot be influenced by the

treating physician. Adding additional sutures to eliminate free space within the wound area is also controversial, as this causes additional trauma and an inadequate amount of tissue may be left for suture placement. An interesting question is thus to evaluate if no-drain mastectomies may yield adequate results when eliminating free space in the wound area by using a lysine-derived urethane adhesive (TissuGlu®, Cohera Medical, Pittsburgh, PA, USA) instead of a suction drain. This adhesive has shown promising results in recent publications [8,9].

2. Case presentation

We present three different patients who were treated with a no-drain/TissuGlu® alternative to the gold standard mastectomy with suction drain. All three patients were female, Caucasian breast cancer patients. Mastectomies were performed as a gold standard procedure, no additional sutures were placed, free space elimination was performed only by the use of TissuGlu®. Adhesive droplet placement occurred via an adhesive applicator, directly on the wound surface (pectoral muscle or fascia) before closure. Following wound closure the surface is compressed and immobilized. Compression was achieved by applying an elastic pressure dressing for a 24 h period.

* Corresponding author. Brustzentrum, Krankenhaus Holweide, Neufelder Str. 32, 51067 Köln, Germany. Tel.: +49 1635050614.

E-mail addresses: ceichler@gmail.com, eichlerc@kliniken-koeln.de (C. Eichler), dahdouhf@kliniken-koeln.de (F. Dahdouh), Fischerp@kliniken-koeln.de (P. Fischer), warmf@kliniken-koeln.de (M. Warm).

Case 1 is a 79 year old patient who was first diagnosed with breast cancer in 1997 (age 64). At that time she had received breast conserving surgery as well as an axillary lymph-node dissection, radiation therapy and anti-hormone therapy. Standard mammography screening revealed recurrence in 2013 at which time a mastectomy was suggested to the patient due to a large ductal carcinoma in situ (DCIS) component as well as patient age and treatment history. The patient had received no prior chemotherapy and no radiation treatment within the last 10 years. She would therefore be at fairly low risk for seroma formation. The patient outright refused post-surgical drain placement.

Case 2 is a 70 year old Alzheimer's patient who received a palliative mastectomy due to a very large breast cancer. A no-drain approach was deemed suitable by the treating physicians, since this patient was often agitated and would have inadvertently removed drainage, thus increasing risk of infection and overall post-surgical rates of complication.

Case 3 is a 43 year old patient who was first diagnosed with breast cancer in 2008 (age 38). After sentinel node biopsy and breast conserving surgery no further treatment was allowed by the patient due to her recently discovered pregnancy. After delivery, all treatment was denied again due to a second (twin) pregnancy within weeks of delivery. She received a caesarean section as well as a sterilization due to a preterm situation not related to the breast cancer history. Ongoing treatment was declined by the patient, as she had to care for her three children, until she discovered a palpable recurrence in 2011. Even after the recurrence was confirmed, further attempts in administering treatment were refused. In 2013, the patient finally opted for a right mastectomy, but as a day case, out-patient procedure. Although this patient would have accepted drains, post-surgical care would have difficult as care continuity could not have been ensured, due to limited patient compliance.

Case 1 represents a patient who was unwilling to accept post-surgical drainage. Cases 2 and 3 represent two very different patient groups, both of whom are incapable of receiving post-surgical drainage. Thus, all three cases received a mastectomy with TissuGlu[®] as an alternative to drain placement. Prior to surgery, the procedure was explained and patient consent was obtained. Surgical procedures did not differ from the routine procedures. Cases 1 and 2 had follow-up visits at 2 and 4 weeks post-operatively with adequate wound healing without signs of seroma, as determined by palpation, inspection and ultrasound. Case 3 developed a seroma that required aspiration at 2 weeks (180 ml) and 4 weeks (60 ml) post-operatively due to patient discomfort. After these aspirations, no further seroma formation occurred. No adverse reaction to the adhesive or other complications during the post-surgical period were noted. Most importantly, patient satisfaction with the no-drain situation was high as post-surgical discomfort was minimal.

3. Discussion

Attempting to reduce post-mastectomy seroma by drain implementation, suction or not, is a controversial topic. However, the literature does not provide sufficient prospective trials on this subject matter in order to clearly favor one option, there may be a trend toward a no-drain situation, since inflammatory responses, often cause by drains themselves, seem to also be responsible for seroma formation [10–12]. Alternative surgical techniques such as progressive tension or quilting suture techniques in mastectomy flap fixation have also shown promise [4,13]. Since areas that have received many previous surgeries, radiation therapy and/or chemotherapy are rarely positively influenced by adding additional sutures these options are often less feasible in breast cancer patients. Other adhesives have also been tested, although convincing

evidence could not be produced [14–17]. Promising results were shown when using TissuGlu[®], in recent publications [7–9]. Regardless, it is generally up to the surgeon's preference and expertise in interpreting the wound surface prior to wound closure which leads to a decision of implementing a drain and/or opting for additional sutures. Despite that fact, it may sometimes become necessary to opt for a no-drain situation even though standard hospital protocols suggest otherwise. Our three cases represent everyday scenarios requiring a no-drain approach, including one patient denying a drain placement outright as well as one case of voluntary and one case of involuntary non-compliance. Faced with this problem we had to consider options to prevent post-operative complications such as seroma formation. We attempted to support a no-drain situation by introducing TissuGlu[®] into the wound surface. This was thought to reduce seroma formation and had shown favorable results. Case 1 and Case 2 did not show signs of seroma formation after surgery. A 2-week and 4-week follow-up did also not show seroma formation. Case 3 did however show small amounts of seroma formation, most likely due to excessive movement by the patient immediately after surgery. Painless aspiration through the mastectomy scar was performed twice with 160 ml and 80 ml having been aspirated during above mentioned follow-up visits. No further aspiration was required thereafter. No hematoma, excessive pain or adverse reaction to the TissuGlu[®] was observed. No wound dehiscence or revision surgeries occurred. In addition to an overall decrease in post-surgical patient discomfort, the no-drain situation allowed all three patient an earlier hospital discharge since drain removal time was not a factor.

4. Conclusion

While these cases do not sufficiently prove that a no-drain situation may yield favorable outcomes when TissuGlu[®] is applied, we show that using this adhesive presents a viable option when faced with a no-drain mastectomy scenario. Factors such as earlier hospital discharge and simpler post-operative care may play a role in the future drain/no-drain debate, especially in units lacking breast care nurses in the community.

Conflicts of interest

There are no conflicts of interest.

Informed consent

Written informed consent was obtained from all patients for publication of this manuscript. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Competing interests

The authors declare that they have no competing interests.

Author contribution

CE and FP analyzed and interpreted the patient data regarding post-surgical outcome. FD and MW performed the surgical procedures and were major contributors in writing the manuscript. All authors read and approved the final manuscript.

References

- [1] Hensel JM, et al. An outcomes analysis and satisfaction survey of 199 consecutive abdominoplasties. *Ann Plast Surg* 2001;46(4):357–63.

- [2] Boostrom SY, et al. Incidence of clinically significant seroma after breast and axillary surgery. *J Am Coll Surg* 2009;208(1):148–50.
- [3] Puttawibul P, et al. Mastectomy without drain at pectoral area: a randomized controlled trial. *J Med Assoc Thai* 2003;86(4):325–31.
- [4] Pollock H, Pollock T. Progressive tension sutures: a technique to reduce local complications in abdominoplasty. *Plast Reconstr Surg* 2000;105(7):2583–6. discussion 2587–8.
- [5] Pollock TA, Pollock H. No-drain abdominoplasty with progressive tension sutures. *Clin Plast Surg* 2010;37(3):515–24.
- [6] Shestak KC. Progressive tension sutures: a technique to reduce local complications in abdominoplasty. *Plast Reconstr Surg* 2000;105(7):2587–8.
- [7] Walgenbach KJ, et al. Randomized, prospective study of TissuGlu® surgical adhesive in the management of wound drainage following abdominoplasty. *Aesthetic Plast Surg* 2012;36(3):491–6.
- [8] Paepke S, et al. Selective tissue adhesion reducing seroma formation in extensive breast surgery: the application of TissuGlu® – only problematic case solver or possible standard procedure? *Eur J Surg Oncol* 2013;39(5):496.
- [9] Eichler C, et al. Seroma suppression using TissuGlu® in a high-risk patient post-mastectomy: a case report. *J Med Case Rep* 2013;7(1):138.
- [10] Yilmaz KB, et al. Comparing scalpel, electrocautery and ultrasonic dissector effects: the impact on wound complications and pro-inflammatory cytokine levels in wound fluid from mastectomy patients. *J Breast Cancer* 2011;14(1):58–63.
- [11] Almond LM, et al. Flap anchoring following primary breast cancer surgery facilitates early hospital discharge and reduces costs. *Breast Care (Basel)* 2010;5(2):97–101.
- [12] Agrawal A, Ayantunde AA, Cheung KL. Concepts of seroma formation and prevention in breast cancer surgery. *ANZ J Surg* 2006;76(12):1088–95.
- [13] Pollock TA, Pollock H. Progressive tension sutures in abdominoplasty: a review of 597 consecutive cases. *Aesthet Surg J* 2012;32(6):729–42.
- [14] Ulusoy AN, et al. Effect of fibrin glue on lymphatic drainage and on drain removal time after modified radical mastectomy: a prospective randomized study. *Breast J* 2003;9(5):393–6.
- [15] Johnson L, et al. Influence of fibrin glue on seroma formation after breast surgery. *Am J Surg* 2005;189(3):319–23.
- [16] Jones GG, et al. Surgical tip – a novel method of applying fibrin sealant during repair of divarication of the recti via an abdominoplasty incision. *J Plast Reconstr Aesthet Surg* 2009;62(11):e457–8.
- [17] Sajid MS, et al. Fibrin glue instillation under skin flaps to prevent seroma-related morbidity following breast and axillary surgery. *Cochrane Database Syst Rev* 2013;5:CD009557.