Med. J. Cairo Univ., Vol. 90, No. 7, December: 2047-2052, 2022
www.medicaljournalofcairouniversity.net

Comparative Study between Subcuticular Suturing With and Without Drain for Wound Closure in Obese Women in Obstetric and Gynecological Operations

WALEED M.M. MOSTAFA, M.D.; SOHA G. SYAM, M.D.; MOSTAFA S. AHMED, M.D.; MELAD M. MOUSA, M.Sc. and AMR M. KAMEL ABOELFATH, M.D.

The Department of Obstetrics and Gynecology, Faculty of Medicine, Zagazig University

Abstract

Background: Subcutaneous wound drainage is used in some obese womenin Obstetric and Gynecological Operations. The indications for its use is not clear.

Aim of Study: This study aimed to evaluate the Value of Subcutaneous Surgical Wound Drainage in Obstetric and Gynecological Operations in obese women.

Patients and Methods: This randomized controlled study included 74 patients undergoing gynecological or obstetric surgery. Patients were divided into two groups based on the placement of drain with subcuticular skin closure. Group A (37 patients) included patients managed with subcuticular suturing with subcutaneous drain, while group B (37 patients) included patients managed with subcuticular suturing without subcutaneous drain.

Results: In group A, the mean VAS (visual analog scale) for pain was 3.0±0.9, ranging between 1 and 4. In group B, the mean VAS for pain was 4.2±0.8, ranging between 3 and 6. A statistically significant difference was found between groups regarding VAS for pain. On the other hand no significant difference was observed between groups regarding postoperative complications.

Conclusion: Many obstetric and gynecological operations can be done safely in obese patients without prophylactic subcutaneous drain age. However, it is still the surgeon's decision to place a drain or not according to multiple factors.

Key Words: *Obesity – Abdomen – Pelvis – Surgical site infection – Subcuticular suturing – Drain – Wound.*

Introduction

OBESITY is a worldwide major health problem. It has multiple adverse effects on the functions and procedures of the body of which wound distruption is considered one its major consequences [1]. Wound infections are a concern in today's National Health Service for new mothers this could result in delayed wound healing, wound dehiscence, pain and prolonged hospital stay. In very extreme circumstances it could lead to sepsis, organ failure and death [2].

The rationale of placement of subcutaneous drains is theoretical and is based on the premise that the removal of any collecting serum or debris and elimination of dead space would perhaps result in lower rate of wound complications. Their use is effective in reducing the incidence of incision Surgical Site Infection (SSI) not only because of the continuous suction of the subcutaneous effusion hematoma and bacteria but also because of reduction in the dead space of the subcutaneous wound area [3]. In contrast to passive (open) drains, Closed-suction Drains (CSDs) establish a pressure gradient between the wound and the external environment and empty into a sealed reservoir, and are believed to reduce the risk of retrograde microbial contamination. Using subcutaneous wound drainage after laparotomy in all patients is unnecessary as it does not reduce SSI risk. Similarly, there seems to be no benefit in using it in clean and clean contaminated wounds [3].

However, there may be benefit in using drains in patients who are at high risk, including patients who are obese and/or have contaminated wound types. A well designed trial is needed which would examine these factors. Studies on prevention of incisional SSI in surgical wounds classified as III or IV based on the US Center for Disease Control and Prevention (CDC) classifications are very few. Such wounds are at high risk for infection [4].

Correspondence to: Dr. Waleed M.M. Mostafa, The Department of Obstetrics and Gynecology, Faculty of Medicine, Zagazig University

Thus, it is assumed that drains can reduce the incidence of surgical site infection, however, the role of subcutaneous drains still questionable [5].

The operation time is longer when we use subcutaneous drain, which may be attributed to the time taken for the drain insertion and then exiting it from the skin through a separate stab and suturing it to the skin [6].

Interrupted sutures is the most commonly used technique in wound closure. Its name is derived from the fact that the individual stitches are not connected. Sutures performed with this technique have the advantage of being easy to place and have a high tensile strength. In addition, individual sutures can be removed (e.g. in cases of infection) without affecting the closure. However, they require a relatively longer time to be placed and, as each suture requires its own knot, are at a greater risk of inducing infection [7]. The primary function of suturing the skin is to maintain tissue approximation during healing, and preferably skin edges must just touch each other. There are many ways to close the skin surgical incision, including continuous orinterrupted sutures, staples, tissue adhesives, or tapes [8]. In our study we aimed to evaluate the Value of Subcutaneous Surgical Wound Drain age in Obstetric and Gynecological Operations in obese women.

Patients and Methods

This randomized controlled interventional study had been conducted in the Obstetrics and Gynecology Department at Zagazig University Hospital. The study was accepted by The Ethical Committee of Faculty of Medicine of Zagazig University. From Dec. 2021 – Oct. 2022. Seventy four patients undergoing obstetric and gynecological operations by Pfannenstiel incision with BMI of 30 or more were enrolled in the study. An informed consent was taken about the patient's participation and acceptance of data collection. Patients with history of Diabetes mellitus, Autoimmune disease, chronic skin disease or immuno-compromised patients were excluded from the study. Selected patients were divided into two groups, 37 patients were managed with subcuticular suturing with subcutaneous drain (Group A), the other 37 had been managed with subcuticular suturing without drain (Group B). All cases were subjected to a written consent for the procedure from all patients, complete history taking, General examination, dermatological examination, local examination, bimanual pelvic examination of both adnexa and uterus and routine ultrasound examination. All patients underwent a full laboratory investigations including a complete blood count, random blood sugar, coagulation profile, liver and kidney function tests and urine analysis.

All patients offered shaving and cleaning for the site of surgery at least 24 hours before operation and received parenteral antibiotics (Ampicillin-sulbactam 1.5gm (IV) - 80mg Gentamicin (IV) one hour before operations. Operations were done under general or spinal anesthesia. Skin incised with Pfannenstiel incision in all operations. Subcutaneous tissue and rectus Sheath were incised with a diathermy pen electrode set to cutting. The parietal Peritoneum was incised in both groups, coagulation diathermy was used to perform hemostasis Then, closure was done for the wound in layers with polyglactin 910 (vicryl). Skin was closed by subcuticular suturing with 2/0 polypropylene with straight cutting needle.

In group A: A drainwas inserted before suturing the subcutaneous space (Nelton Tube sized 6.7mm in diameter) connected to a sterile collecting bag. The drain came out of the wound via a separate stab site lateral to the skin incision. The subcutaneous space was thoroughly irrigated with saline, then closed with interrupted 2/0 vicryl sutures. Skin was closedby subcuticular suturing with 2/0 polypropylene with straight cutting needle, Drain was fixed to the skin by aseparate suture.

In group B: Subcutaneous space was thoroughly irrigated and sutured by interrupted (2/0) polyglact in sutures without leaving a drain. After skin closure, the incision site was mobbed with povidone iodine, lastly the wound was covered by two pieces of sterile dressing under a surgical tape.

Follow-up:

- *Day one and two:* We checkedthe wound coverings and content of the collecting bag connected to the drain.
- After 48 hours: Using povidone iodine we changed dressing by another two sterile pieces of dressing and surgical tape.
- After 7 days: Drain and polypropylene sutures wereremoved, wound was assessed for healing and presence of any complications.

Outcomes:

The two groups were compared regarding:

1- Primary outcome: Wound infection, wound dehiscence, seroma, hematoma and abscess formation.

2- Secondary outcome: Cases needing secondary sutures and longer hospital stay.

Statistical analysis:

Data collected throughout history, basic clinical examination, laboratory investigations and outcome measures coded, entered and analyzed using Microsoft Excel software. Data were then imported into Statistical Package for the Social Sciences (SPSS version 21.0) (Statistical Package for the Social Sciences) software for analysis. According to the type of data qualitative represent as number and percentage, quantitative continues group represent by mean ± SD, the following tests were used to test differences for significance. Difference and association of qualitative variable by Chi square test (X^2). Differences between quantitative independent groups by *t*-test. *p*-value was set at <0.05 for significant results and <0.001 for high significant result. Data were collected and submitted to statistical analysis. The following statistical tests and parameters were used: Mean, standard deviation (SD) and the chi-square (X^2) test.

Results

There was no statistically significant difference between both groups regarding patient characteristics (Table 1).

In group A, 17 (45.9%) patients underwent caesarean section, 10 (27%) underwent myomectomy, and 10 (27%) underwent hysterectomy. In group B, 16 (43.2%) patients underwent caesarean section, 9 (24.3%) underwent myomectomy, and 12 (32.4%) underwent hysterectomy. No statistically significant difference was found between groups regarding surgical procedure (Chi-square test, p=0.110) (Table 1).

No statistically significant difference was found between both groups regarding duration of surgery and mean hospital stay (Table 2).

In group A, the mean VAS for pain was 3.0±0.9, ranging between 1 and 4. In group B, the mean VAS for pain was 4.2±0.8, ranging between 3 and 6. A statistically significant difference was found between groups regarding VAS for pain (Independent sample *t*-test, p=0.00 1) (Table 2).

As shown in (Table 3) In group A, two (5.4%) patients developed superficial wound infections that resolved by antibiotic therapy and daily dressing, Wound seroma was observed in one (2.7%) patient. Wound disruption occurred in one (2.7%) patient. None developed postoperative fever or wound hematoma. In group B, three (8.1 %) patients developed wound infections, including two patients with superficial infections and one patient with deep infections that required surgical debridement. Postoperative fever was detected in two (5.4%) patients. One (2.7%) patient had wound hematoma, and three (8.1 %) patients had wound seroma. One (2.7%) patient had wound disruption. As shown in Table (3), no statistically significant difference was observed between groups regarding postoperative complications (Chi-square test, p>0.05).

Table (1): Patient characteristics (N=74).

	Group A (N=37)	Group B (N=37)	*p*-value
Age (years):*			
Mean ± SD	40.8± 13.8	43.3± 13.8	0.431 **a**
Range	19-65	19-63	
BMI (kg/m ^{2}):*			
Mead ± SD	37±4.2	3 8.6±4.5	0.129**a**
Range	30.1-44.8	30.2-44.9	
*ASA Grading**:*			
GradeI	22 (59.5%)	21 (56.8%)	0.779**b**
Grade II	13 (35.1%)	15 (40.5%)	
GradeIII	2 (5.4%)	1 (2.7%)	
*Surgical procedure**:*			
Caesarean Section	17 (45.9%)	16 (43.2%)	0.110**b**
Myomectomy	10 (27%)	9 (24.3%)	
Hysterectomy	10 (27%)	12 (32.4%)	

* Data are presented as mean ± SD.
**Data are presented as frequency (percentage).
a Independent sample *t*-test. **b** Chi- squaretest.

Table (2): Operative and postoperative outcomes (N=74).

	Group A (N=37)	Group B (N=37)	*p*-value*
Duration of Surgery (min):*			
Mean ± SD	44.6±9.2	44.7± 8.6	0.948**a**
Range	31-60	31-60	
Hospital Stay (days):			
Mean ± SD	3.5±0.8	3.6±0.9	0.700
Range	2-5	2-5	
VAS for Pain:			
Mean ± SD	3.0±0.9	4.2±0.8	0.001
Range	1-4	3-6	

*Independent samplet test.

Table (3): Postoperative complications (N=74).

	Group A (N=37)		Group B (N=37)		*p*-value*
	Frequency	%	Frequency	%	
Wound infection	2	5.4	3	8.1	0.643
Post operative fever	0	0	2	5.4	0.152
Hematoma	0	0	1	2.7	0.314
Seroma	1	2.7	3	8.1	0.304
Wound disruption	1	2.7	1	2.7	1.000

*Chi-square test.

Discussion

Obesity is a major health problem affecting a wide range of organ functions, including wound healing. Obese women are more likely to have post operative wound infection, seromas, dehiscence, and hematoma, especially after caesarean section. postoperative problems can be reduced by decreasing operating time, using antibiotics, irrigating the surgical site **[9]**.

Wound complications may have catastrophic consequences, necessitating many reoperations and a high mortality rate rather than being minor problems that merely need antibiotics and local wound therapy. Closure of the subcutaneous tissue could potentially lower the risk of problems, not only by reducing stress on tissues, but also by limiting probable dead space for seroma and blood collection which in turn reduce the incidence of post-operative wound complications **[10]**.

Sub-rectus sheath drains, or drains between the sheath and the skin (subcutaneous) are sometimes used after caesarean section operations. Drains are used routinely by less than 10% of obstetricians in the UK, but in a survey 52% used them when indicated at the time of operation. There are disadvantages of using a sub-sheath drain. Women sometimes find the site of drainage tubes uncomfortable and an attached suction bottle inconvenient after surgery. Drains can be difficult or painful to remove and occasionally have to be removed under anesthesia **[11]**.

The drainage tube itself can provide a focus for infection and can even lead to sinus formation between the skin and abdominal cavity. Some surgeons would argue that a drain is not necessary because the peritoneum heals extremely rapidly and reabsorbs blood as part of this process **[12]**.

In this study, we aimed to evaluate the Value of Subcutaneous Surgical Wound Drain age in Obstetric and Gynecological Operations in obese women.

Seventy four patients were enrolled in our randomized controlled study. All patients underwent gynecological or obstetric operations. Patients were divided into two groups based on the placement of drain with subcuticular skin closure. Group A (37 patients) included patients managed with subcuticular suturing with subcutaneous drain, while group B (37 patients) included patients managed with subcuticular suturing without subcutaneous drain.

Regarding demographic characteristics; In group A, the mean age was 40.8±13.8 years, ranging between 19 and 65 years. In group B, the mean age was 43.3±13.8 years, ranging between 19 and 63 years. No statistically significant difference was found between groups regarding age distribution. In group A, the mean BMI was 37±4.2kg/m^2, ranging between 30.1 and 44.8kg/m^2. In group B, the mean BMI was 38.6±4.5kg/m^2, ranging between 30.2 and 44.9kg/m^2. No statistically significant difference was found between groups regarding BMI distribution. No statistically significant difference was found between groups regarding basic demographic data. In group A, 22 (59.5%) patients were grade I, 13 (35.1%) were grade II, and 2 (5.4%) were grade III. In group B, 21 (56.8%) patients were grade I, 15 (40.5%) were grade II, and 1 (2.7%) were grade III. No statistically significant difference was found between groups regarding ASA grading.

Regarding the duration of surgery in group A, the mean duration was 44.6±9.2 minutes, ranging between 31 and 60 minutes. In group B, the mean duration was 44.7±8.6 minutes. Ranging between 30 and 60 minutes. No statistically difference was found between both group.

Comes in comparison with our findings, Dwivedi et al., **[13]** who reported that Mean duration of surgery was assessed and it was more in the study group than in the control group. The process of assembling and putting a subcutaneous drain increased the duration of surgery. The study group had mean duration of 1.71 hours which was more as compared to control group .In the study of Chung et al., **[14]** also found statistically different between groups regarding the mean operative time.

In addition to above findings, we found that in group A, the mean hospital stay was 3.5±0.8 days, ranging between 2 and 5 days. In group B, the mean hospital stay was 3.6±0.9 days, ranging between 2 and 5 days. No statistically significant difference was found between groups regarding duration of hospital stay (p=.700).

On the other hand, Nowar et al., **[15]** reported that the subcutaneous drain group had a significantly greater range of hospital stays than the control one (p-value=0.038). In agreement that Ibrahim et al., **[16]** also showed that patients with subcutaneous drains spent more time in the hospital after surgery than those without subcutaneous drains (p-value 0.040).

In the present study, in group A, the mean VAS for pain was 3.0±0.9, ranging between 1 and 4. In

group B, the mean VAS for pain was 4.2±0.8, ranging between 3 and 6. A statistically significant difference was found between groups regarding VAS for pain (p=.001). Postoperative pain was reported by Silabuszewska - Józ´wiak et al., [17] found no difference between the drain and no drain groups (mean difference –0.15, 95% CI –0.36 to 0.06.

In the current study, in group A, two (5.4%) patients developed superficial wound infections that resolved by antibiotic therapy and daily dressing, Wound seroma was observed in one (2.7%) patient. Wound disruption occurred in one (2.7%) patient. Another two (5.4%) patients required redressing. None developed postoperative fever or wound hematoma. In group B, three (8.1 %) patients developed wound infections, including two patients with superficial infections and one patients with deep infections that required surgical debridement. Postoperative fever was detected in two (5.4%) patients. One (2.7%) patients had wound hematoma, and three (8.1 %) had wound seroma. One (2.7%) patients had wound disruption.No statistically significant difference was observed between groups regarding postoperative complications.

Similar to our findings, Nowar et al., [15] reported that both groups were infected at the same rate (p-value=0.062 While Chelmow et al., [18] verified the advantages of subcutaneous suture closure in women with 2cm or more of subcutaneous tissue thickness; they also showed that when compared to women with unclosed wounds, subcutaneous suture closure significantly reduced wound disruption and seroma.

A meta-analysis conducted by Gates and Anderson, [12] found no evidence of a difference in the risk of wound infection, other wound complications, febrile morbidity or pain in women who had wound drains compared with those who did not.

Conclusion:

According to the results of this study obstetric and gynecological operations can be done safely in obese patients without prophylactic subcutaneous drainage. However, it is still the surgeon's decision to place a drain or not according to multiple factor.

References

1- PIERPONT N.Y., DINH P.T., SALAS R. and ERIKA L.: Johnson, 1,2 Terry G. Wright, 1,2 Martin C. Robson, 2 and Wyatt G. PayneObesity and surgical wound healing: A Current review; ISRN Obes., 1-13, 2014.

2- TOTTOLI E.M., DORATI R., GENTA I.,CHIESA E., PISANI S. and CONTI B.: Skin Wound Healing Process and New Emerging Technologies for Skin Wound Care and Regeneration. Pharmaceutics, 12 (8): 735, 2020.

3- ERNE F., WETZEL S., WÜLKER N., GESICKI M. and HOFMANN U.K.: Close dsuction drainage after primary to talknee arthroplasty: A prospective randomized trial. The Journal of Knee Surgery, 31 (8): 804-810, 2018.

4- COLETTA D., DELBASSO C., GIULIANI G. and GUERRA F.: Subcutaneous suction drains do not prevent surgical site infections in clean-contaminated abdominal surgery-results of a systematic review and meta-analysis. Langenbeck's Archives of Surgery, 404 (6): 663-668, 2019.

5- MUJAGIC E., ZEINDLER J., COSLOVSKY M., HOFFMANN H., SOYSAL S.D., MECHERA R. and WEBER W.P.: The association of surgical drains with surgical site infections-A prospective observational study. The American Journal of Surgery, 217 (1): 17-23, 2019.

6-CECKA F., JON B., SKALICKY´ P., CERMÁKOVÁ E., NEORAL Č and LOVECEK M.: Results of a randomized controlled trial comparing closed-suction drains versus passive gravity drains after pancreatic resection. Surgery, 164 (5): 1057-1063, 2018.

7- MOSAFER KHOORJESTAN S. and ROUHI G.: Anautomatic suturing machine for intestinal anastomosis: Advantages compared with hand-suturing technique. Surgical Innovation, 26 (2): 209-218, 2019.

8- MAGED A.,MOHESEN M.N., ELHALWAGY A., ABDELAAL H., ALMOHAMADY M., ABDELLATIF A.A., ALSWAFA A., ABDELMALEK K., NABIL H., FAHMY R.M. and WAGEIH H.: Subcuticular inter rupted versus continuous skin suturing in electiveces are an section in obese women: A randomized controlled trial, The Journal of Maternal-Fetal and Neonatal Medicine, 32 (24): 4114-4119, 2019.

9- IBRAHIM S.A., ABDALLA M.M. and ELSHAFEI R.M.: Evaluation of subcutaneous drain age system versus tissue re-approximation alone using Pfannenstiel incision in obese females undergoing cases are an section, 16 (5): 10-13, 2021.

10- ANFINAN N. and SAIT A.: Appropriate Management of Subcutaneous Tissue of Midline Abdominal Incisions. Cureus, 12 (1), 2020.

11- HE S., XIA J., ZHANG W., LAI M., CHENG N., LIU Z. and CHENG Y.: Prophylactic abdominal drain age for pancreatic surgery. Cochrane Data Base Syst Rev., 12 (12): CD010583, 2021.

12- GATES S. and ANDERSON E.R.: Wound drain age for cases are an section. Cochrane Data Base Syst Rev., 13: CD004549, 2013.

13- DWIVEDI J.S., GUPTA A.S. and PARDESHI S.H.: A comparative study of two different techniques of subcutaneous tissue closure in abdominal surgery. Int. J. Reprod. Contracept Obstet. Gynecol., 6: 5512-8, 2017.

14- CHUNG Y.S., LEE J., NAM E.J., et al.: Impact of subcutaneous negative pressure drains on surgical wound healing in ovarian cancer International Journal of Gynecologic Cancer, 31: 245-250, 2021.

15- NOWAR A.Y., REZK A.A., NEGM and SAAD A.S.: Comparative study between subcutaneous drainage system

versus tissue reapproximation alone in obese females undergoing caesarean section, Benha Journal of Applied Sciences, Vol. (7) Issue (3), 2022.

16- IBRAHIM S.A., ABDALLA M.M. and ELSHAFEI R.M.: Evaluation of subcutaneous drainage system versus tissue re-approximation alone using Pfannenstiel incision in obese females undergoing caesarean section, 16 (5): 10-13, 2021.

17- SŁABUSZEWSKA-JÓiWIAK A., SZYMAN´SKI J.K., JÓiWIAK L´., SARECKA-HUJAR B.: A Systematic Review and Meta-Analysis of Wound Complications after a Caesarean Section in Obese Women. J. Clin. Med., Feb. 10; 10 (4): 675, 2021.

18- CHELMOW D., RODRIGUEZ E.J. and SABATINI M.M.: Suture Closure of Subcutaneous Fat and Wound Disruption after Cesarean Delivery: A Meta-analysis. Obstet. Gynecol., 103: 974-80, 2004.

دراسة مقارنة بين الخياطة تحت الجلد مع وجود ارتشاف سلبياً وبدون ارتشاف عند السيدات البدينات فى عمليات النساء والتوليد

يعانى المرضى الذين يخضعون لجراحة سرطان الجهاز التناسلى للمرأة من مضاعفات الجروح بمعدلات تتراوح من ٥٪ إلى ٣٥٪. تم تطوير مصارف الجروح تحت الجلد منذ ما يقرب من عقدين من الزمن لتصريف النتوءات من الجروح، هدفنا إلى المقارنة بين الشفط السلبى مقابل عدم التصريف مقابل الغرزة المتقطعة لاغلاق الجرح عند النساء البدينات فى عمليات التوليد وأمراض النساء. كانت هذه دراسة عشوائية محكومة، حيث تم تسجيل مجموعة ٧٤ مريضاً يخضعون لجراحة أمراض النساء والتو ليد. تم تقسيم المرضى إلى مجموعتين على أساس وضع التصريف مع إغلاق الجلد تحت الجلد. تضمنت المجموعة أ ٣٧ مريضاً مرضى تم علاجهم بخياطة تحت الجلد باستخدام تصريف تحت الجلد، فى حين تضمنت المجموعة ب ٣٧ مريضاً مرضى تم علاجهم بخياطة تحت الجلد دون نزيف تحت الجلد. فى المجموعة أ ، كان متوسط شدة الألم 3.0±0.9، ويتراوح بين ١ و ٤ . فى المجموعة ب، كان متوسط شدة الألم 4.2±0.8، ويتراوح بين ٣ و ٦. تم العثور على فرق معتد به إحصائياً بين المجموعات فيما يتعلق بشدة الألم ولكن لم يلاحظ.