Araştırma Makalesi *Research Article*

Pamukkale Tıp Dergisi
Pamukkale Medical Journal

doi:https://dx.doi.org/10.31362/patd.1047843

The effect on postoperative bowel movements of intraoperative drain application during laparoscopic bilateral tubal sterilization

Laparoskopik bilateral tubal sterilizasyon operasyonu sırasında dren uygulanmasının postoperatif barsak hareketlerine etkisi

Buğra Şahin, Gizem Cura Şahin

Gönderilme tarihi:26.12.2021 Kabul tarihi:18.03.2022

Abstract

Purpose: The use of a drain during a laparoscopic bilateral tubal sterilization (L/S BTS) operation is not a routine procedure, but enables close follow up of a patient when there is suspected bleeding. The aim of this study was to investigate the potential benefits of drain placement during L/S BTS operation in respect of the gastrointestinal system postoperatively.

Materials and methods: A retrospective evaluation was made of patients applied with L/S BTS at Turhal State Hospital between June 2019 and March 2021. The study included a total of 64 women; 22 applied with a drain during L/S BTS operation and 42 women not applied with a drain. The two groups of patients were compared in respect of age, time to postoperative gas-faeces output, abdominal pain, the formation of intra-abdominal abscess-hematoma, wound site infection, operation time, and time of hospital discharge.

Results: In the comparison of the patients with and without a drain, there was seen to be earlier gas and faeces output in the patients where a drain was used (p=0.003, p=0.018). Greater abdominal pain was felt in the first 12 hours (p=0.029), and a higher rate of wound site infection was observed (p=0.008) in the patients with a drain.

Conclusion: Perioperative placement of a drain in patients applied with L/S BTS was seen to result in earlier gas-faeces output but greater abdominal pain. Drain application in the early postoperative period can be considered to have a positive effect on the bowel movements evacuating laparoscopy gas.

Key words: Bilateral tubal sterilization, drain, laparoscopy.

Sahin B, Cura Sahin G. The effect on postoperative bowel movements of intraoperative drain application during laparoscopic bilateral tubal sterilization. Pam Med J 2022;15:485-490.

Öz

Amaç: Laparoskopik bilateral tubal sterilizasyon (L/S BTS) operasyonu sırasında dren kullanımı rutin bir uygulama olmayıp kanama şüphesi durumunda hastanın yakın takibini mümkün kılar. Bu çalışma ile L/S BTS operasyonu sırasında dren uygulamasının postoperatif dönemde gastrointestinal sistem açısından olası faydalarını araştırmak amaçlanmıştır.

Gereç ve yöntem: Turhal Devlet Hastanesi'nde Haziran 2019 ile Mart 2021 arasında L/S BTS uygulanmış hastaların dosya verileri retrospektif olarak tarandı. Çalışmaya L/S BTS operasyonu sırasında dren uygulanmış 22 hasta kadın ile L/S BTS operasyonu sırasında dren uygulanmamış olan 42 hasta kadın olmak üzere toplamda 64 hasta kadın dahil edildi. Gruplar; yaş, ameliyat sonrası gaz-feçes çıkışına kadar geçen süre, karın ağrısı, karın içi apse-hematom oluşumu, yara yeri enfeksiyonu, ameliyat süresi ve hastaneden taburcu olma süresi açısından karşılaştırıldı.

Bulgular: Dren kullanılan hastalar ile dren kullanılmayan hastalar karşılaştırdıklarında; dren kullanılan hastalarda gaz ve gaita çıkış saatlerinin daha erken olduğu bulundu (p=0,003 ve p=0,018). Ancak dren kullanılan hastalar ilk 12 saatte daha fazla abdominal ağrı hissetmekteydiler (p=0,029). Yine dren konulan hastalarda daha fazla yara yeri infeksiyonu oluştuğu gözlendi (p=0,008).

Sonuç: L/S BTS yapılan hastalara peroperatif dren uygulanması ile postoperatif dönemde gaz-gaita çıkışı daha erken saatte olmakta ancak abdominal ağrı hissi daha fazla olmaktaydı. Dren uygulaması ile postoperatif erken dönemde boşalan laparoskopi gazının bağırsak hareketlerini olumlu yönde etkilediği kanaatindeyiz.

Anahtar kelimeler: Bilateral tubal sterilizasyon, dren, laparoskopi.

Şahin B, Cura Şahin G. Laparoskopik bilateral tubal sterilizasyon operasyonu sırasında dren uygulanmasının postoperatif barsak hareketlerine etkisi. Pam Tıp Derg 2022;15:485-490.

Buğra Şahin, M.D. Denizli State Hospital, Denizli, Turkey, e-mail: raaakun@gmail.com (https://orcid.org/0000-0003-0429-3085) (Corresponding Author)

Gizem Cura Şahin, M.D. Tokat State Hospital, Tokat, Turkey, e-mail: drgizemcura@gmail.com (https://orcid.org/0000-0001-5696-4683)

Introduction

Tubal sterilization (TS) is the general term used to refer to surgical procedures applied to prevent gametes or a fertilised oocyte passing from the tube to the endometrial cavity where it could be implanted, with the aim of preventing pregnancy [1]. Since the introduction of the routine use of laparoscopy in the 1970s, the most selected technique, especially in the interval period, has become the laparoscopic bilateral tubal sterilization (L/S BTS) method [2]. Following the development of mechanical methods in particular and increased reliability of the electrocoagulation technique, L/S BTS became more widely used [3].

The main advantages of laparoscopy are good cosmetic results, a shorter hospitalisation time and low adhesion score [4]. Carbon dioxide is used during laparoscopy to expand the peritoneal cavity and create pneumoperitoneum. Following this procedure, an amount of residual gas may inevitably remain in the peritoneal cavity. Although it is a less invasive technique, patients who have undergone laparoscopy may experience postoperative shoulder pain, nausea and vomiting, and the time to gas-faeces output may be prolonged, due to this residual gas [5].

It has been reported that peritoneal gas drainage in the first 4-6 hours after laparoscopy reduces the volume of residual intraperitoneal gas and consequently improves symptoms in the recovery period [6, 7]. However, it has also been reported that routine drain use increases the possibility of postoperative infection [8]. Kerimoglu et al. [9] demonstrated that the use of a drain in patients undergoing laparoscopic ovarian cystectomy increased postoperative abdominal pain and prolonged the length of stay in hospital.

The aim of this study was to investigate the effects of drain application during L/S BTS operation on the gastrointestinal system in the postoperative period in respect of nausea-vomiting, the time to gas-faeces output, abdominal pain, and potential intra-abdominal abscess or hematoma formation, wound site infection, and the time to discharge.

Material and method

This study was conducted as a restrospective examination of the data of 64 female patients who underwent L/S BTS on their own and their husband's request in the Obstetrics and Gynaecology Clinic of Turhal State Hospital between June 2019 and March 2021.

An intra-abdominal drain was placed at the end of the procedure in 22 patients, and no drain was placed in 42 patients. The women included in the study were aged 30-45 years, and had no co-morbid diseases. Patients were excluded from the study if the procedure had to be converted to open surgery during the operation or if complications developed such as organ perforation. Approval for the study was granted by the Ethics Committee of Tokat Gaziosmanpasa University. All patients provided informed consent.

The operations of all the patients were performed by the same surgeon. In all cases, 1 gr cefazoline was administered intravenously as prophylactic antibiotic 30 minutes before general anaesthesia induction (It was not applied to those with penicillin allergy). L/S was applied with the standard 2-port method, with the placement of one 10 mm port from the umbilicus and the other 5 mm port from the left lateral inferior abdominal wall, following the creation of a distension environment using carbondioxide via a Veress needle placed intra-umbilically. Using LigaSure Impact (LS, Medtronic, Dublin, Ireland), the cauterisation-cutting and tissue removal procedures were applied to the bilateral tubes. During the procedure, the gas pressure was set to 12 mm Hg, and at the end of the operation, mild abdominal compression was applied to all the patients to passively remove the carbondioxide. Postoperative pain control was provided for all the patients with 100 mg diclofenac followed by 3 doses of 500 mg paracetamol every 8 hours. Some of the patients were obese, and all of them received enoxaparin 0.4 2*1 in the postoperative period with the recommendation of the cardiovascular doctor.

In 22 of the L/S BTS operations, because of suspected bleeding, a soft plastic drain was placed in the left lateral inferior abdominal wall from where the 5 mm trochar had been removed, and this drain was then removed after 24 hours. In 42 of the L/S BTS operations, no drain was used. The two patient groups of with and without drain were compared in respect of age, body mass index (BMI), previous abdominal surgery,

and operating time, and in the postoperative period, nausea-vomiting, abdominal pain, time to first gas-faeces output, length of hospital stay, and complications in the first 2 weeks (intra-abdominal abscess- hematoma, wound site infection). The severity of abdominal pain felt in the first 12 hours postoperatively was evaluated using a Visual Analog Scale (VAS).

Statistical analysis

Data obtained in the study were analyzed statistically using SPSS vn 20 software (Statistical Package for Social Sciences, Chicago, IL, USA). Descriptive statistics were presented as mean±standard deviation values for continuous variables, and as number (n) and percentage (%) for categorical variables. In the comparisons of paired groups, the Mann Whitney U-test, the Independent Samples t-test, or the Chi-square tests were used. A value of $p<0.05$ was accepted as statistically significant.

Results

Evaluation was made of a total of 64 patients who underwent L/S BTS; 22 applied with a drain and 42 not applied with a drain. The patient characteristics, postoperative VAS scores, and operative outcomes of both groups are shown in Table 1. The mean age of the patients was 32.55±2.77 years in the drain group and 33.10±3.13 years in the non-drain group ($p=0.491$). No significant difference was determined between the groups in respect of BMI and history of abdominal surgery ($p=0.262$, $p=0.619$). The operating time of 43.18±8.38 mins in the group with drain applied was statistically significantly longer compared to 36.19±6.22 mins in the group where no drain was used

Table 1. Patient characteristics and postoperative findings

	Drain (+) n=22	Drain (-) n=42	*p* value
Age (years)	32.55±2.77	33.10±3.13	0.491
BMI (kg/m^2)	27.95±2.12	28.86±3.68	0.262
Previous abdominal operation	6 (27.27%)	14 (33.33%)	0.619
Operation time (min)	43.18±8.38	36.19±6.22	**0.001***
Nausea/vomiting	4 (18.18%)	7 (16.67%)	0.879
VAS scoreforabdominalpain (first 12 hours)	4.82±2.68	3.26±2.5	**0.029***
Time to gasoutput (hour)	16.36±6.52	21.33±5.9	**0.003***
Time to first defecation (hour)	26.36±7.57	31.24±7.61	**0.018***
Postoperativelength of stay in hospital (hours)	40.36±17.19	39.43±13.84	0.814
Intra-abdominal abscess	1 (4.54%)	4 (9.52%)	0.481
Intra-abdominal hematoma	1 (4.54%)	5 (11.9%)	0.337
Infection at incision site	5 (22.72%)	1 (2.38%)	**0.008***

Variables are presented as mean ± standard deviation (SD) values or number (n) and percentage (%)

($p=0.001$). The postoperative VAS scores were 4.82±2.68 in the drain group and 3.26±2.5 in the non-drain group ($p=0.029$). The time to first gas output and defecation was earlier in the group applied with a drain ($p=0.003$, $p=0.018$). No significant difference was determined between the groups in respect of length of hospital stay ($p=0.814$) or the development of intra-abdominal abscess or hematoma ($p=0.481$, $p=0.337$). A higher rate of infection in the incision line was observed in the group with a drain applied ($p=0.008$).

Discussion

In this study, an evaluation was made of 22 patients with a drain applied because of suspected bleeding and 42 patients for whom the procedure was completed without drain placement in L/S BTS operations performed in a single centre in a period of approximately 2 years. The study results showed that the patients with a drain applied had a shorter postoperative time to first gas output and defecation but experienced more pain in the first 12 hours and developed more infection in the incision line. The placement of a drain was also seen to prolong the operating time.

The presence of gas or fluid in the peritoneal cavity following laparoscopic

surgery can increase the risk for the patient of experiencing pain or developing infections or other complications [10]. To reduce this risk, an intraperitoneal drain is generally placed at the end of the operation. Many studies have suggested that drain placement after laparoscopy could play a role in reducing pain [11-13], as the drain assists in more rapid expulsion of residual intraperitoneal carbon dioxide. Thus, especially shoulder pain, and abdominal pain are reduced, the patient can be mobilized earlier in the postoperative period and can then be discharged from hospital earlier.

However, it has also been reported that the use of a drain can increase abdominal pain and cause discomfort for reasons such as subcutaneous and sub-fascia irritation, tissue damage and obstruction or twisting [14]. In the current study, the mean VAS scores of the patients with a drain were determined to be higher than those of the patients without a drain. The placement of the drain was considered to have increased the pain scores by causing subcutaneous and sub-fascia irritation. In a study by Georgiou et al. [15], drain placement was shown to have led to pain causing a prolonged length of stay in hospital. In the current study, both the groups of patients with and without drain had similar times to discharge.

In patients with an intraperitoneal drain placed perioperatively, more comfortable bowel movements have been reported as no increase in intra-abdominal pressure has formed associated with less laparoscopic gas in the abdomen postoperatively [16]. In the current study, the patients with drain placement had less nausea and vomiting and earlier gas-faeces output. It was determined that in the group where a drain was not used, intestinal peristalsis was decreased by the residual laparoscopic gas, however small the amount, increasing intra-abdominal pressure, and thus, gas-faeces output was delayed.

The ideal drain catheter should totally drain retained fluid, thus preventing the development of infection, should not damage the surrounding tissues, and should be able to be easily removed when necessary [17]. However, the use of a drain is a cause of concern among surgeons as to whether or not it will constitute an infection risk. Micro-organisms can enter from the external environment and infect other tissues, especially the abdominal wall. Shen et al. [18] evaluated 164 cases where a prophylactic drain was used during laparoscopic-assisted vaginal hysterectomy, and reported that there was no need for routine drain use in respect of postoperative infection and morbidity. In our study, some of the patients with intraabdominal abscess and wound infection; patients who stated that they were allergic to penicillin. These patients received only flagyl as an antibiotic in the postoperative period. In addition, it was later understood that these patients with intra-abdominal abscess and wound infection unfortunately did not use their medicines properly at home and did not make their dressings properly in the postoperative period. Some of the patients with hematoma were obese, and all of them received enoxaparin 0.4 2*1 in the postoperative period with the recommendation of the cardiovascular doctor. The cause of bleeding has been attributed to enoxaparin. In addition, the epigastric superficialis arteries were damaged unnoticed during the 5 mm port trocar insertion during the operation. The reason why this was not noticed was that the laparoscopy gas created pressure, causing the intraoperative hematoma to be missed. Hematomas naturally turned into intra-abdominal abscesses. In addition, the surgical suture used for the drain fixation is non-absorbable and was deliberately removed so that the suture remains in the postoperative period. Because in the sutured incision, the wound lips will get closer, it is believed that it will close in a shorter time. However, this suture stay also caused infection. In the current study, a higher rate of wound site infection was seen in the group with a drain applied than in the group with no drain.

There were some limitations to this study. Due to the retrospective design, data were collected and analyzed from the available patient follow-up forms and patient files. The relatively low number of patients in each group could have caused the results not to be significant in the comparisons of some parameters. In this context, there is a clear need for further, prospective studies with greater numbers of patients.

In conclusion, the data of this study demonstrated that perioperative drain placement in patients undergoing L/S BTS

resulted in earlier expulsion of laparoscopic gas postoperatively and earlier gas-faeces output. The use of a drain can be considered to have had a positive effect on the early postoperative bowel movements evacuating laparoscopic gas. However, the presence of the drain also caused the patients to feel more abdominal pain.

Conflict of interest: No conflict of interest is declared by the authors.

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Ethics committee approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The study protocol was approved by the (no:21-KAEK-058 and date: 10/03/2021) Ethics Committee of Tokat Gaziosmanpasa University.

Contributions of the authors to the article

B.Ş. and G.C.Ş. constructed the main idea and hypothesis of the study. B.Ş. and G.C.Ş. they developed the theory and organized the material method section. B.Ş. and G.C.Ş. made the evaluation of the data in the results section. Discussion section of the article written by B.Ş. has reviewed and made the necessary corrections and approved. In addition, all authors discussed the entire study and confirmed its final version.