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Effect of Hemming Stitch Closure of Peritoneum at Cesarean Section on Adhesions: A Randomized Controlled Trial

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ABSTRACT

Objectives: To study the effect of Hemming stitch closure of the peritoneum at cesarean section on intra-abdominal adhesions and compare postoperative adhesion formation rate between the Hemming stitch closure group, the simple closure group, and the non-closure group.

Materials and Methods: A prospective randomized controlled trial was conducted at Phon Hospital with 240 primiparous patients carrying full-term single fetuses, delivered by cesarean section between May 2017 and January 2020. They were randomized into 3 groups: 80 primiparous patients in the non-closure group, 80 primiparous patients in the simple closure group, and 80 primiparous patients in the Hemming stitch closure group. Between July 2019 and February 2024, 146 patients (46 cases in the non-closure group, 52 cases in the simple closure group, and 48 cases in the Hemming stitch closure group) returned for subsequent cesarean section. Data on adhesion formation were collected and analyzed using the SPSS program.

Results: The total adhesion formation rates in the Hemming stitch closure group, simple closure group, and non-closure group were 10.4%, 48.1%, and 58.7%, respectively. The severe adhesion formation rates were 4.2%, 15.4%, and 39.1%, respectively. The total adhesion formation rates and severe adhesion formation rate in the Hemming stitch closure group were statistically significantly lower than in the simple closure group and non-closure group ($p < 0.05$).

Conclusion: Hemming stitch closure of the peritoneum at cesarean section reduces both the overall adhesion formation rate and the rate of severe adhesion. The author recommends using Hemming stitch closure of the peritoneum in cesarean section procedures to effectively reduce the adhesion formation rate.

Keywords: hemming stitch closure, peritoneum closure, non-closure, cesarean section, adhesion.

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ผลของการเย็บปิดเยื่อบุช่องท้องด้วยวิธีมิ้มขอบแผลไว้ด้านนอกช่องเยื่อบุช่องท้องต่อการเกิดพังผืดหลังการผ่าตัดคลอดทางหน้าท้อง: การทดลองแบบสุ่มที่มีกลุ่มควบคุม

ประพจน์ เนติโรจนกุล

บทคัดย่อ

วัตถุประสงค์: *เพื่อศึกษาผลของการเย็บปิดเยื่อบุช่องท้องด้วยวิธีมิ้มขอบแผลไว้ด้านนอกช่องเยื่อบุช่องท้องต่อการเกิดพังผืดในช่องท้องหลังการผ่าตัดคลอด และเพื่อเปรียบเทียบอัตราการเกิดพังผืดหลังการผ่าตัดคลอดระหว่างกลุ่มที่ได้รับการเย็บปิดเยื่อบุช่องท้องด้วยวิธีมิ้มขอบแผลไว้ด้านนอกช่องเยื่อบุช่องท้อง กลุ่มที่ได้รับการเย็บปิดเยื่อบุช่องท้องด้วยวิธีดั้งเดิมและกลุ่มที่ไม่ได้เย็บปิดเยื่อบุช่องท้อง*

วัสดุและวิธีการ: *การวิจัยแบบสุ่มและมีกลุ่มควบคุมนี้ เป็นการวิจัยไปข้างหน้าซึ่งดำเนินการที่โรงพยาบาลพล ในหญิงตั้งครรภ์เดี่ยว และครรภ์แรกที่มาคลอดบุตรโดยมีข้อบ่งชี้การผ่าตัดคลอดทางหน้าท้องเป็นครั้งแรก ในระหว่าง พฤษภาคม 2560 ถึง มกราคม 2563 รวมทั้งหมด 240 คน แล้วแบ่งเป็น 3 กลุ่มโดยวิธีสุ่ม ดังนี้ กลุ่มที่ 1 ได้รับการผ่าตัดคลอดโดยไม่เย็บปิดเยื่อบุช่องท้อง 80 คน กลุ่มที่ 2 ได้รับการผ่าตัดคลอดโดยเย็บปิดเยื่อบุช่องท้องด้วยวิธีดั้งเดิม 80 คน และกลุ่มที่ 3 ได้รับการผ่าตัดคลอดโดยเย็บปิดเยื่อบุช่องท้องด้วยวิธีมิ้มขอบแผลไว้ด้านนอกช่องเยื่อบุช่องท้อง 80 คน เมื่อทำการติดตามผลตั้งแต่กรกฎาคม 2562 ถึง กุมภาพันธ์ 2567 มีผู้ป่วย 146 คนกลับมาผ่าตัดคลอดซ้ำ เป็นผู้ป่วยในกลุ่มที่ 1 ไม่เย็บปิดเยื่อบุช่องท้อง 46 คน กลุ่มที่ 2 เย็บปิดเยื่อบุช่องท้องด้วยวิธีดั้งเดิม 52 คน และกลุ่มที่ 3 เย็บปิดเยื่อบุช่องท้องด้วยวิธีมิ้มขอบแผลไว้ด้านนอกช่องเยื่อบุช่องท้อง 48 คน จึงทำการเก็บรวบรวมข้อมูลการเกิดพังผืดที่พบ และวิเคราะห์ข้อมูลโดยใช้โปรแกรม SPSS*

ผลการศึกษา: *ผู้ป่วยกลุ่มที่เย็บปิดเยื่อบุช่องท้องด้วยวิธีมิ้มขอบแผลไว้ด้านนอกช่องเยื่อบุช่องท้อง ผู้ป่วยกลุ่มที่เย็บปิดเยื่อบุช่องท้องด้วยวิธีดั้งเดิม และผู้ป่วยกลุ่มที่ไม่เย็บปิดเยื่อบุช่องท้อง มีอัตราการเกิดพังผืดรวม ร้อยละ 10.4 ร้อยละ 48.1 และร้อยละ 58.7 ตามลำดับ และมีอัตราการเกิดพังผืดชนิดหนา ร้อยละ 4.2 ร้อยละ 15.4 และร้อยละ 39.1 ตามลำดับ ผู้ป่วยกลุ่มที่เย็บปิดเยื่อบุช่องท้องด้วยวิธีมิ้มขอบแผลไว้ด้านนอกช่องเยื่อบุช่องท้อง มีอัตราการเกิดพังผืดรวมและมีอัตราการเกิดพังผืดชนิดหนาน้อยกว่า กลุ่มที่เย็บปิดเยื่อบุช่องท้องด้วยวิธีดั้งเดิม และผู้ป่วยกลุ่มที่ไม่เย็บปิดเยื่อบุช่องท้องอย่างมีนัยสำคัญทางสถิติ ($p < 0.05$)*

สรุป: *การเย็บปิดเยื่อบุช่องท้องด้วยวิธีมิ้มขอบแผลไว้ด้านนอกช่องเยื่อบุช่องท้องสามารถลดทั้งอัตราการเกิดพังผืดรวมและอัตราการเกิดพังผืดชนิดหนาหลังการผ่าตัดคลอดได้ ผู้วิจัยขอแนะนำให้ใช้วิธีการเย็บปิดเยื่อบุช่องท้องด้วยวิธีมิ้มขอบแผลไว้ด้านนอกช่องเยื่อบุช่องท้อง (Hemming stitch closure) ในการผ่าตัดคลอดเพื่อลดอัตราการเกิดพังผืดในช่องท้องได้อย่างมีประสิทธิภาพ*

คำสำคัญ: *วิธีมิ้มขอบแผล, การเย็บปิดเยื่อบุช่องท้อง, การไม่เย็บปิดเยื่อบุช่องท้อง, การผ่าตัดคลอดทางหน้าท้อง, การเกิดพังผืด*

Introduction

Currently, worldwide, including in Thailand, cesarean sections are being performed at a higher rate. Cesarean section is the most common major abdominal surgery performed on women of reproductive age[1-3]. Abdominal adhesions from the tissue repair process are the most common consequence after abdominal surgery. Therefore, cesarean section can cause postoperative adhesions that may lead to bowel obstruction, chronic pelvic pain, and female infertility. Additionally, these adhesions can complicate repeat cesarean sections, delay the delivery of infants, and cause injury to abdominal organs such as the intestines and bladder[4-7].

From past to present, many studies on the effects of closure and non-closure of the peritoneum at cesarean sections have shown that non-closure does not cause harm although, it does not restore the integrity of the abdominal anatomy. Currently, there are difference techniques for peritoneum closure in cesarean sections, including: 1. Non-closure (the peritoneum is left open and not sutured), 2. Parietal peritoneum closure (only the parietal peritoneum is closed), 3. Visceral peritoneum closure (only the visceral peritoneum is closed) and 4. Both parietal and visceral peritoneum closure[8]. Non-closure of peritoneum has several advantages during surgery and in short-term postoperative outcomes such as operation time, pain, and analgesia requirement[6, 9-12]. However, studies on the long-term outcomes of postoperative adhesions are varied and inconclusive. Therefore, the debate between the closure and non-closure of the peritoneum remains controversial among obstetricians and gynecologists[13-16].

Peritoneum histology consists of a single layer of mesothelial cells with an underlying supporting layer of highly vascularized loose connective tissue. The luminal surface of mesothelial cells is covered with microvilli. The proteins and serosal fluid trapped by microvilli provide a slippery, non-adhesive surface for internal organs to slide past one another (Fig. 1)[17]. Following surgery, blood and inflammatory exudate (a precursor of fibrin matrix formation) still leak from the cut edges of the peritoneum into the peritoneal cavity for a few hours. If the fibrin matrix formed in the peritoneal cavity is not completely lysed, fibroblastic proliferation may occur within them causing adhesion formation[7, 18-20]. With Hemming stitch closure of the peritoneum, both sides of the cut edges of parietal and visceral peritoneum are folded (hemmed) outside the peritoneal cavity. Therefore, blood and inflammatory exudate from the cut edges cannot enter the peritoneal cavity, and the healing process of the cut edges occurs outside the peritoneal cavity. The peritoneal cavity immediately restores its normal surface anatomy, fully covered with mesothelial cells to prevent adhesion formation.

The author hypothesized that Hemming stitch closure of the peritoneum may reduce the adhesion formation rate in cesarean sections by these mechanisms. This research was conducted to study the effect of Hemming stitch closure of the peritoneum during cesarean sections on intra-abdominal adhesions and compare the adhesion formation rate between Hemming stitch closure, simple closure, and non-closure groups.

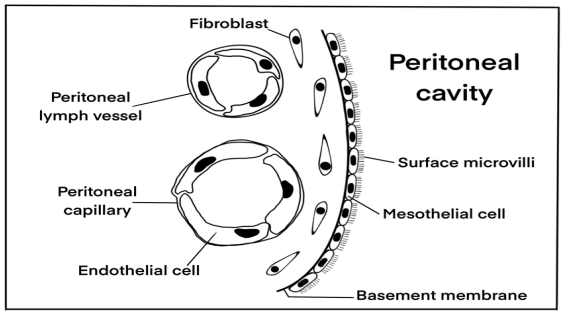


Fig. 1. Histology of the Peritoneum.

Materials and Methods

This prospective randomized controlled trial was conducted at Phon Hospital in Khon Kaen, Thailand. It was approved by the Research Ethics Committee of Phon Hospital and written informed consents were obtained from primiparous patients who met the inclusion criteria. The participants were primiparous patients aged 18-35 years with a full-term single fetus, delivered by cesarean section without any exclusion criteria (e.g. those who wanted sterilization with surgery, had adhesions found during surgery, or declined to participate).

The study was a clinical trial comparing the effects of non-closure, simple closure, and Hemming stitch closure of the visceral and parietal peritoneum on adhesion formation assessed at a subsequent cesarean section. Out of the 764 women undergoing primary cesarean section between May 2017 and January 2020, 240 primiparous patients consented to participate. They were randomly allocated into three groups using computer software-generated random sequences: 80 in the non-closure group, 80 in the simple closure group and 80 in the Hemming stitch closure group. Standard techniques were performed in all operations. The choice of anesthesia was made by the anesthesiologist independently of the treatment group. The surgeries were performed by the researcher wearing powder-free gloves. The abdomen was accessed through a Pfannenstiel incision. A transverse lower uterine segment incision was closed with two layers of continuous chromic catgut No. 1 suture with in situ uterine repair to prevent the visceral peritoneum from losing moisture. In the non-closure group, both the visceral and parietal peritoneum were left unsutured. In the simple closure group and Hemming stitch closure group, both the visceral and parietal peritoneum were closed using continuous suture patterns with simple continuous stitch and continuous hemming stitch, respectively, using chromic catgut No. 2-0 (Fig. 2). In each group, the rectus muscle reapproximation was closed with chromic catgut No. 2-0. The rectus sheath was closed with a simple continuous stitch using polyglactin (Vicryl) No. 1. The subcutaneous tissue was approximated with interrupted sutures using chromic catgut No. 2-0, followed by skin closure with a running subcuticular suture using polyglycolic acid (Dexon) No. 4-0. All patients received intraoperative prophylactic intravenous cefazolin 2 grams.

Between July 2019 and February 2024, a total of 146 patients returned for subsequent cesarean section, with 46 cases in the non-closure group, 52 cases in the simple closure group, and 48 cases in the Hemming stitch closure group. The adhesions are defined as bands of fibrous scar tissue that form on organs in the abdomen causing organs to stick to one another or to the wall of the abdomen[21]. The author was the sole doctor to perform both the initial and repeat cesarean sections. The study was a double-blind study. Participants were unaware of which treatment group they were assigned to, and the surgeon was blinded to the patient allocation when evaluating outcomes during repeat cesarean sections. The circulating nurse recorded the presence of adhesions using an adhesion record form along with the patient's identification number. If a patient had multiple sites of mixed mild and severe adhesions, the circulating nurse would only record on the most severe adhesion site. The patient's identification number would later be translated to the results of each treatment group.

Patients subsequently returning for a repeat cesarean section were evaluated intraoperatively for the presence of adhesions at various sites: abdominal wall to uterus, abdominal wall to bladder, abdominal wall to bowel, uterus to bladder, abdominal wall to omentum and uterus to omentum. Data on adhesion formation was collected. The severity of adhesions was categorized into mild adhesions (thin, clear, soft, and flexible adhesion, which can be removed with fingers) and severe adhesions (dense, tough, and hard adhesion, scissors are needed for cutting). If a single adhesion had both mild and severe components, it was classified as severe. The time from skin incision to finish operation was recorded. Postoperative fever

was defined as a temperature higher than 38°C on two consecutive postoperative days or higher than 39°C on any postoperative day. The sample size was calculated based on the primary outcome measure, which was the presence of adhesions. A pilot study of 60 participants, with 20 primipara patients in each group. After 12 cases returned for a repeat cesarean section in each group, it was found that the adhesion rates for non-closure, simple closure, and Hemming stitch closure were 58%, 50%, and 17%, respectively. The sample size was calculated for a 33% reduction in the adhesion rate (the difference in adhesion rate between simple closure and Hemming stitch closure). The minimum sample size needed was 30 patients in each group, with an alpha of 0.05 and a power of 80. The sample size in this study was set to 40 in each group. Assuming a dropout rate of 50% the participants are set to 80 in each group. Thus, the total participant is 240 primipara patients.

The data was analyzed using the SPSS program to calculate the mean, standard deviation, frequency, and percentage. The means of characteristics between more than two groups were analyzed using an F-test (one way analysis of variance: one way ANOVA) and the comparison of adhesion formation rates between groups was analyzed using a chi-square test or Fisher's exact test with a power of 95%.

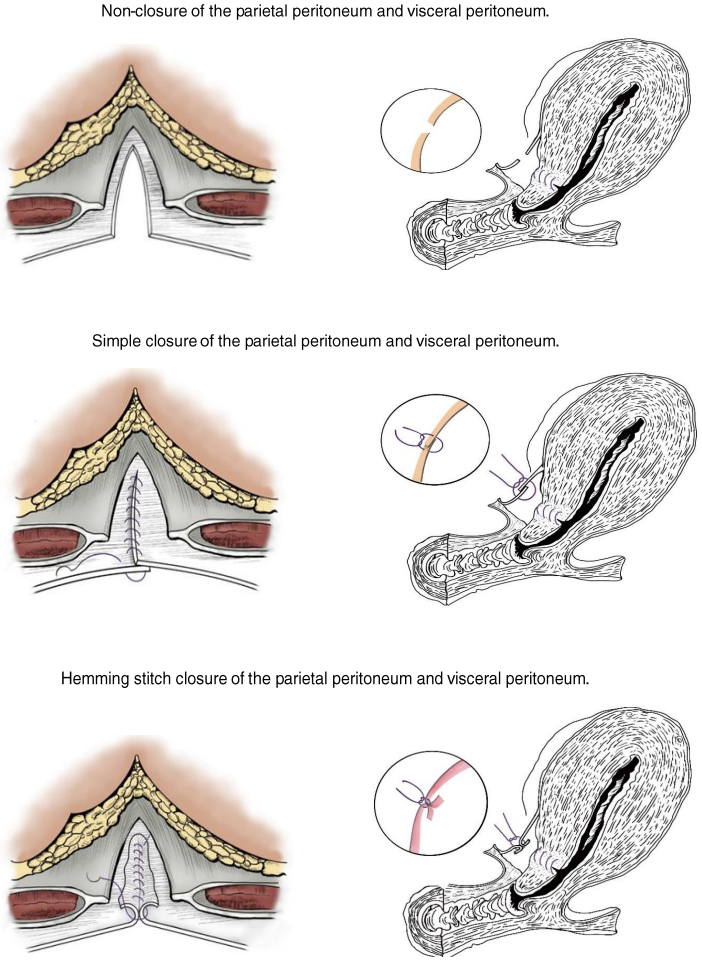


Fig. 2. Anatomical views of non-closure, simple closure and Hemming stitch closure.

Results

Of the 764 women undergoing primary cesarean section, 240 primipara patients were randomly allocated into 3 groups: 80 cases in the non-closure group, 80 cases in the simple closure group, and 80 cases in the Hemming stitch closure group. In total, 146 patients (46 in the non-closure group, 52 in the simple closure group, and 48 in the Hemming stitch closure group) returned for subsequent cesarean section to be evaluated for adhesion (Fig. 3). The characteristics of primipara patients randomized to non-closure, simple closure, and Hemming stitch closure of the peritoneum are described in Table 1. The three groups did not significantly differ in age, weight, indications for cesarean section, postoperative fever, or duration of hospitalization. However, the operation time in the non-closure group was statistically significantly shorter than in the other groups, while the operation time did not significantly differ between the simple closure group and the Hemming stitch closure group.

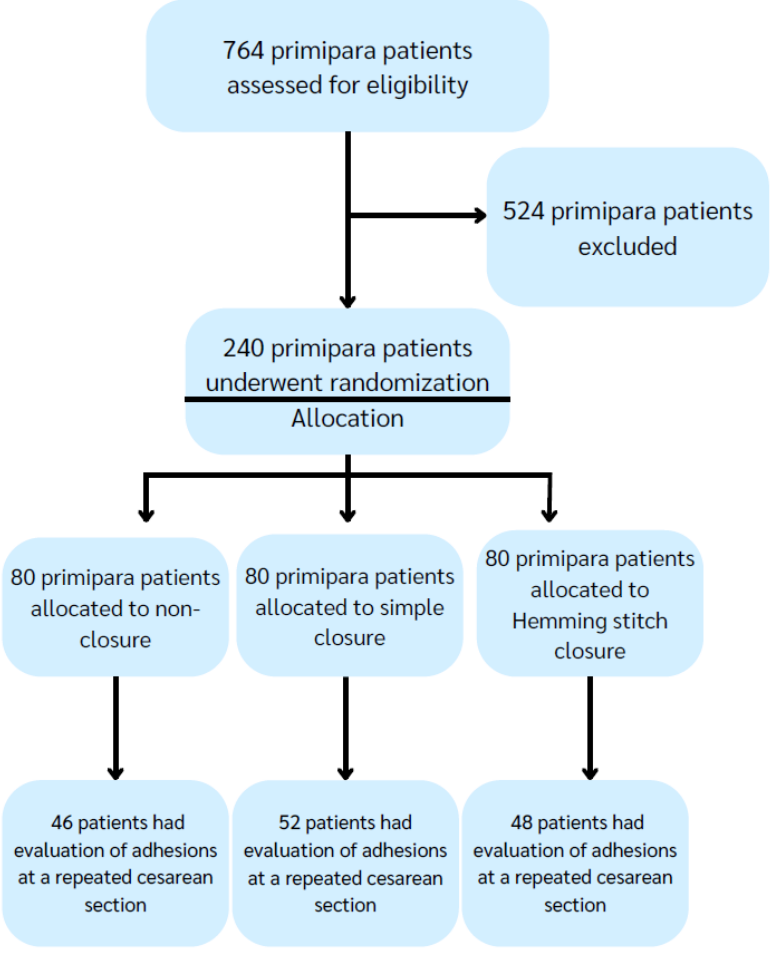


Fig. 3. Flow chart of the study.

Table 1. Characteristics of primiparous patients randomized to non-closure, simple closure, and Hemming stitch closure of the peritoneum.

Characteristics	Non-closure (n = 46)	Simple closure (n = 52)	Hemming stitch closure (n = 48)	p value
Mean age (years)	25.8 ± 3.5	25.5 ± 3.4	26.0 ± 3.0	0.781
Mean weight (kgs)	69.1 ± 7.6	69.3 ± 8.6	70.1 ± 8.2	0.827
No. of patients with indications for cesarean section				
- Labor dystocia	36 (78.3%)	39 (75.0%)	36 (75.0%)	0.838
- Fetal distress	7 (15.2%)	9 (17.3%)	7 (14.6%)	
- Breech/transverse presentation	3 (6.5%)	2 (3.85%)	4 (8.3%)	
- Placenta previa	0 (0.0%)	2 (3.85%)	1 (2.1%)	
Mean operation time (minutes)	45.0 ± 6.0	51.8 ± 5.1	53.7 ± 4.6	< 0.001
Compare the mean operation time between groups (minutes)	45.0 ± 6.0	51.8 ± 5.1	-	< 0.001
	45.0 ± 6.0	-	53.7 ± 4.6	< 0.001
	-	51.8 ± 5.1	53.7 ± 4.6	0.084
No. of patients with postoperative fever (BT > 38°C)				
- Present	4 (8.7%)	2 (3.8%)	4 (8.3%)	0.564
- Not present	42 (91.3%)	50 (96.2%)	44 (91.7%)	
Mean duration of hospitalization (days)	3.1 ± 0.4	3.2 ± 0.4	3.2 ± 0.4	0.547

BT: body temperature

146 patients were assessed for the presence and severity of adhesions, including the mean time to delivery at repeated cesarean section (Table 2, 3). The total adhesion formation rates in the Hemming stitch closure group, simple closure group, and non-closure group were 10.4%, 48.1%, and 58.7%, respectively. Therefore, the total adhesion formation rate in the Hemming stitch closure group was statistically significantly lower than in the simple closure group and non-closure group ($p < 0.05$). Additionally, the severe adhesion rates in the Hemming stitch closure group, simple closure group, and non-closure group were 4.2%, 15.4%, and 39.1%, respectively. The severe adhesion rate in the Hemming stitch closure group was statistically significantly lower than simple closure group and non-closure group ($p < 0.05$). It was also shown that the severe adhesion rate in the non-closure group was statistically significantly higher than in the simple closure group ($p < 0.05$). The Hemming stitch closure group had the shortest mean time to deliver during repeat cesarean sections, which was statistically significantly shorter than both the simple closure and non-closure groups (9.02 min, 10.46 min, and 12.13 min, respectively).

Table 2. Adhesion formation in the non-closure group, simple closure group, and Hemming stitch closure group.

Adhesion formation	Non-closure (n = 46)	Simple closure (n = 52)	Hemming stitch closure (n = 48)	p value
No. of patients with presence of adhesion				
- Not present	19 (41.3%)	27 (51.9%)	43 (89.6%)	< 0.001
- Present	27 (58.7%)	25 (48.1%)	5 (10.4%)	
Compare the adhesion formation rate between groups (%)	27 (58.7%)	25 (48.1%)	-	0.317
	27 (58.7%)	-	5 (10.4%)	< 0.001
	-	25 (48.1%)	5 (10.4%)	< 0.001

Table 3. Severity of adhesion and the mean time to deliver in the non-closure group, simple closure group, and Hemming stitch closure group.

Severity of adhesion	Non-closure (n = 46)	Simple closure (n = 52)	Hemming stitch closure (n = 48)	p value
No. of patients with presence of adhesion				
- Not present	19 (41.3%)	27 (51.9%)	43 (89.6%)	< 0.001
- Mild adhesion*	9 (19.6%)	17 (32.7%)	3 (6.2%)	
- Severe adhesion**	18 (39.1%)	8 (15.4%)	2 (4.2%)	
Compare the severe adhesion rate between groups (%)	18 (39.1%)	8 (15.4%)	-	0.025
	18 (39.1%)	-	2 (4.2%)	< 0.001
	-	8 (15.4%)	2 (4.2%)	< 0.001
Mean time to delivery (minutes)	12.13 ± 3.84	10.46 ± 2.45	9.02 ± 1.04	< 0.001
Compare the mean time to delivery between groups (minutes)	12.13 ± 3.84	10.46 ± 2.45	-	0.002
	12.13 ± 3.84	-	9.02 ± 1.04	< 0.001
	-	10.46 ± 2.45	9.02 ± 1.04	0.008

Mild adhesions*: thin, clear, soft, and flexible adhesion, could be removed with fingers.
Severe adhesions**: dense, tough, and hard adhesion, scissors were needed for cutting.

Table 4 shows the site and severity of adhesion in all 57 patients with adhesion formation. It revealed that the most common site of adhesion was from the abdominal wall to the uterus (50.88%). This site was also the most common location of adhesion in the 28 patients with severe adhesion (71.4%).

Table 4. Site and severity of adhesion in the non-closure group, simple closure group, and Hemming stitch closure group with the presence of adhesion formation.

Severity of adhesion	Non-closure (n = 27)		Simple closure (n = 25)		Hemming stitch Closure (n = 5)		Severity of adhesion		Total (n = 57)
	Mild adhesion	Severe adhesion	Mild adhesion	Severe adhesion	Mild adhesion	Severe adhesion	Mild adhesion (n = 29)	Severe adhesion (n = 28)	
No. of patients with presence of adhesion									
- Abdominal wall to uterus	4	11	5	7	0	2	9 (31.0%)	20 (71.4%)	29 (50.88%)
- Abdominal wall to bladder	1	0	2	0	0	0	3 (10.3%)	0 (0.0%)	3 (5.26%)
- Abdominal wall to bowel	0	1	0	0	0	0	0 (0.0%)	1 (3.6%)	1 (1.75%)
- Uterus to bladder	0	1	1	0	0	0	1 (3.5%)	1 (3.6%)	2 (3.51%)
- Abdominal wall to omentum	2	3	6	0	2	0	10 (34.5%)	3 (10.7%)	13 (22.81%)
- Uterus to omentum	2	2	3	1	1	0	6 (20.7%)	3 (10.7%)	9 (15.79%)

Discussion

From past to present, the studies and the Cochrane Collaboration® review have shown that closure and non-closure of the peritoneum at cesarean section has no significant difference on intra-abdominal adhesion rate, in addition the non-closure reduces surgery time about 6 minutes and no harm was found, therefore many surgeons omit peritoneal closure due to insufficient evidence of benefit to justify the additional time and use of suture material necessary for peritoneal closure[16, 22].

At the present, there is no conclusion between closure and non-closure of the peritoneum about the better method in reducing adhesions because the results of studies are different. This has remained a controversial issue among the obstetricians and gynecologists for decades[23-26]. Most recent studies on the cesarean section procedure have focused on the short-term morbidity of closure versus non-closure of the peritoneum or closure types of the anterior abdominal wall layers in cesarean section. This focus was due to the fact that it takes less time to follow-up on the results, and the finding showed no significant impact on postoperative analgesic usage and short-term morbidity[27-28]. However, the clinical benefits on short-term morbidity are typically small when compare to the long-term morbidity such as adhesion that can lead to significant healthcare costs due to the complications they cause, particularly in terms of additional surgeries, hospital readmissions, and

longterm treatments[29]. In July 2016 the CORONIS trial a large, international clinical study designed to investigate the outcomes of different surgical techniques used during a cesarean section reported outcomes at the 3 year follow-up. Despite the large size of this trial, they did not find any technique that resulted in improved outcomes[30].

Until now, this is the first study that identified the effect of Hemming stitch closure of the peritoneum and this study showed that the total adhesion formation rate in non-closure group was slightly higher than simple closure group (58.7% vs 48.1%) but it is not statistically significant (p = 0.317) similar to previous studies[23-24]. However, using a Hemming stitch closure of the visceral and parietal peritoneum during cesarean section could reduce the overall adhesion rate by approximately five times compared to simple closure or non-closure of the peritoneum. The severe adhesion rate could be reduced by about four times when compared to the simple closure group and approximately nine times when compared to the non-closure group. Hemming stitch closure of the peritoneum may provide a solution to this controversial issue. Because this study was a double-blinded randomized controlled trial, it is the most reliable type of study. In this research the author was the only surgeon who performs surgery, so the quality of surgery was more consistent than many doctors because not all surgeons were equally skilled. The limitation of this study was that it was a long-term study with a high dropout rate (about 40%), making it hard to obtain a large sample size.

Cesarean section is the most commonly performed abdominal surgery in the world, with approximately 30 million mothers undergoing the procedure each year. If this new method is used as a standard procedure, it can prevent many patients from experiencing adhesions after cesarean section, who may suffer from the long-term effects of intra-abdominal adhesions such as intestinal obstruction, chronic pelvic pain, and infertility. Additionally, performing a subsequent cesarean section is easier, reduces the risk of injury to abdominal organs, decreases surgery time, and lowers costs.

The Hemming stitch closure is a new suturing technique that is quick and harmless, taking no more time than traditional simple continuous sutures. Surgeons can easily understand and implement this method, as it does not require any additional equipment, making it accessible to all pregnant women worldwide who require a cesarean section.

The Hemming stitch closure of the peritoneum offer a new perspective on how to close the peritoneum to achieve maximum effectiveness in preventing adhesion formation. The result of this study may change the way surgeons perform peritoneal closure in the future, and recommendations to omit peritoneal closure from many institutes may be called into question. The practice of non-closure of the peritoneum during cesarean delivery may become contraindicated in the future.

The Hemming stitch closure can also be applied to almost all intra-abdominal surgeries, including appendectomy, intestinal surgery, laparoscopic port site closure, and more. If this new method of closing the peritoneum can reduce adhesions after a cesarean section, it may also decrease abdominal adhesions resulting from other intra-abdominal surgeries. However, further research is needed to confirm the effects of Hemming stitch closure on the peritoneum in other intra-abdominal surgeries.

Conclusion

This study showed that Hemming stitch closure of the peritoneum at cesarean section reduces both the overall adhesion formation rate and the rate of severe adhesion. The author recommends using Hemming stitch closure of the peritoneum in cesarean section procedures to effectively reduce the adhesion formation rate.

Potential conflicts of interest

The author declares no conflicts of interest.

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