

PFANNENSTIEL VERSUS MAYLARD INCISION FOR GYNECOLOGIC SURGERY: A RANDOMIZED, DOUBLE-BLIND CONTROLLED TRIAL

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SUMMARY

Objective: The aim of this study was to compare the effects of the transverse muscle-cutting Maylard incision and the Pfannenstiel incision for hysterectomies, in terms of postoperative complications, pain, and quality of life.

Materials and Methods: This randomized, double-blind study compared two laparotomy techniques. All hysterectomies were performed for benign conditions. Eighty cases were randomly assigned to receive either Pfannenstiel or Maylard incisions. Measured intraoperative variables included volume of blood loss and duration of surgery. Postoperative variables included abdominal distension, postoperative pain, and quality of life.

Results: Postoperative abdominal distension was significantly lower in the Maylard group ($p=0.004$). There were no differences in intraoperative characteristics and duration of hospitalization, hemorrhage volume, or duration of surgery between the two groups.

Conclusion: Hysterectomy performed via the Maylard incision was associated with the use of fewer additional analgesics than hysterectomy performed via the Pfannenstiel incision. [*Taiwan J Obstet Gynecol* 2009;48(2): 120-123]

Key Words: gynecologic surgery, Maylard incision, Pfannenstiel incision

Introduction

Hysterectomy is one of the most commonly performed surgical procedures. After cesarean delivery, it is the second most frequently performed major surgical procedure in the United States [1].

One of the lasting marks of any abdominal surgery and most noticeable to the patient is the scar made by the incision. In selecting an incision, the gynecologist must take into consideration the underlying pathology prompting the surgery, the suspicion of malignancy,

and any upper abdominal disease or underlying comorbidities.

Gynecologic surgery often uses a suprapubic incision for obstetric and pelvic operations. Since the initial description by Pfannenstiel [2], various transverse incisions have been reported. The main difference between them lies in the transection of the rectus muscle, as performed by Maylard [3]. This technique can be used as an alternative to midline laparotomy when good exposure of the pelvis is needed [3]. The Maylard incision is a true transverse muscle-cutting incision, in which all layers of the lower abdominal wall are incised transversely. Before the skin incision is made, a series of three to four perpendicular markings with a sterile marking pen are made across the planned line of the incision. These markings help in later approximation of the skin edges. The transverse skin incision is made



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about 3–8 cm above the symphysis, depending on the indications for surgery and the patient's age and weight. The skin incision should never be made in a deep skin crease or beneath a large panniculus.

The fascia is incised transversely, and the aponeurosis is not detached from the underlying muscle. After a transverse fascial incision lateral to the borders of the rectus muscles, the inferior epigastric vessels lying on the posterior lateral border of each muscle are identified. The vessels are teased away from their attachments using gentle finger dissection. The vessels are ligated before incising the rectus muscles, to avoid tearing of the vessels, vessel retraction, and hematoma formation. The surgeon's fingers are used to tease the overlying rectus muscle from the peritoneum, and the muscles are sectioned between the fingers using Bovie cautery.

For better approximation of the muscles during closure, we prefer to suture the underlying muscle to the overlying fascia before entering the peritoneum. A 2-0 delayed-absorbable "U" suture is used, and the knots are placed anterior to the fascia. The peritoneum is then incised transversely.

Closure of the fascia is similar to the running technique used for other transverse incisions. The muscles do not need to be reapproximated with individual sutures.

The Pfannenstiel incision is used for routine surgery in our center, but a disadvantage of this technique is that the surgeon does not have a good view during surgery. We, therefore, decided to use a new technique, the Maylard incision, which does not suffer from this disadvantage, and also produces acceptable cosmetic results.

The aim of this study was to compare the transverse muscle-cutting Maylard incision and the Pfannenstiel incision for hysterectomies, in terms of postoperative complications, pain, and quality of life.

Materials and Methods

This randomized, double-blind study compared two laparotomy techniques and was conducted at the Vali-e-Asr Reproductive Health Research Center, Vali-e-Asr Hospital, affiliated to the Tehran University of Medical Sciences. The study was approved by the ethics and research committee of the Tehran Medical University. Women undergoing hysterectomy between January 2006 and January 2007 were considered for enrolment in the study.

All hysterectomies were performed for benign conditions. Exclusion criteria included a scarred abdominal wall, abdominal wall hernia, diabetes mellitus, myopathy, recent corticosteroid therapy, abnormal homeostasis, anticoagulant treatment, and malignancies.

Eighty cases were assigned to surgery with either the Pfannenstiel or Maylard incision. After providing written legal and moral consent, they were divided randomly (according to a random number table) into these two groups. All patients and persons involved in postoperative care (and outcome assessors) were masked to the incision assignment throughout the study period.

The operative procedure was similar and followed the same technical steps in both groups. All operations were performed by a resident surgeon with an attending physician assisting. All women received standard general anesthesia. After Pfannenstiel or Maylard incision, the hysterectomy followed standard procedures. Absorbable sutures were used in all cases. Each woman received intravenous antibiotic prophylaxis with cephalothin (Tabriz Zakarya Co., Iran; 1 g every 6 hours), continued for three doses. Immediately after the operation, each patient received a single-dose of intramuscular pethidine 50 mg (Alodan; Gerot-Pharmazeutika, Vienna, Austria). Diclofenac suppositories were prescribed to control pain, as required. In the case of severe pain, up to three doses of pethidine injections were administered.

All patients were cared for in the same surgical unit. Early feeding before bowel movement and removal of the Foley catheter were performed 12–24 hours after surgery, and patients were encouraged to walk.

Intraoperative variables measured included volume of blood loss and duration of surgery. Abdominal distension was assessed postoperatively. Our criteria for abdominal distension were a lack of bowel sound, abdominal wall distention, and tympanic percussion.

Postoperative pain was assessed using the visual analogue scale (VAS; scale ranging from 0 mm, for no pain, to 100 mm, for unbearable pain), and by the use of postoperative analgesia. Pethidine injections administered after surgery, prescription of diclofenac suppositories, and any use of extra analgesia were noted. The VAS is an internationally accepted rating scale for pain, on which each patient scores his or her pain after intervention, relative to the situation before intervention. The scores are scaled from 0 to 1. It was assessed twice a day, at 9:00 am (at rest), and after walking at 3:00 pm, from the first to the fourth day after surgery. Patient characteristics such as age, parity and number of previous cesarean sections were also noted. The related quality of life was evaluated using a 10-point questionnaire that is standardized in Iran and especially designed for Iranian women.

Each patient completed the questionnaire 3 months after surgery to assess late postoperative pain and related quality of life. Data were analyzed with SPSS version 12 software (SPSS Inc., Chicago, IL, USA) using Fisher's exact test and *t* test.

Results

During the study period, 80 patients were evaluated. Thirty-seven women underwent the Pfannenstiel incision and 42 the Maylard incision. One patient was lost to follow-up, and thus data from 79 patients were analyzed.

There were no significant differences in age and body mass index between the two groups. The demographic data are shown in Table 1.

Evaluation of preoperative details (Table 2) indicated that surgery performed through a Pfannenstiel incision was not significantly shorter and was not associated with less blood loss. Postoperative abdominal distension was significantly lower in the Maylard group ($p=0.004$), and no severe abdominal distension was noted in this group.

Analysis of urinary catheter removal indicated no difference between the two groups. The mean (\pm standard deviation) numbers of hospitalized days did not differ significantly between the two groups (Table 2). The VAS scores for postoperative pain ($p<0.32$) and postoperative satisfaction during 3 days of hospital stay (75% in Maylard vs. 72% in Pfannenstiel group; $p<0.12$) were similar between the two groups.

Table 1. Demographic data for the two groups*

	Incision type		<i>p</i>
	Pfannenstiel	Maylard	
Age (yr)	48.0 \pm 6.1	46.7 \pm 4.8	0.29
BMI (kg/m ²)	26.0 \pm 4.1	27.1 \pm 4.8	0.3

*Data are presented as mean \pm standard deviation. BMI = body mass index.

Table 2. Preoperative details and complication

	Incision type		<i>p</i>
	Pfannenstiel	Maylard	
Duration of surgery, mean \pm SD (min)	96.3 \pm 14.9	97.8 \pm 21.7	0.7
Estimated blood loss, mean \pm SD (mL)	128.2 \pm 40.7	119.6 \pm 46.2	0.37
Abdominal distension (%)			0.004
Mild	44.7	82.4	
Moderate	52.6	17.6	
Severe	2.6	0	
Length of stay, mean \pm SD (d)	2.6 \pm 0.6	2.5 \pm 0.5	0.47
Pethidine injection, mean \pm SD (<i>n</i>)	1.5 \pm 0.6	1.1 \pm 0.4	0.006
Diclofenac suppository, mean \pm SD (<i>n</i>)	3.5 \pm 1.3	3.1 \pm 1.1	0.095

SD = standard deviation.

Discussion

Until 1900, obstetric and gynecologic procedures used only vertical skin incisions. In 1890, Kushner and Rapin began to use transverse skin incisions. In 1987, Pfannenstiel said that an optimal abdominal incision should provide safe, easy peritoneal entry and allow adequate intraoperative exposure. Meanwhile, closure should be associated with minimal risk of a cut or late wound problems [2].

Transverse incisions are believed to be associated with reduced postoperative pain and reduced inhibition of deep respiratory excursions. The Maylard incision is typically chosen, because it produces good cosmetic results with increased lateral pelvic exposure [3,4]. Helmkamp and Krebs [5] suggested that the Maylard technique was cosmetically acceptable, strong, and easy to learn. It is the preferred technique when optimal exposure and accessibility to the pelvis are required [5]. In 2001, Scribner et al [6] showed that Pfannenstiel incisions were feasible and not associated with increased morbidity. Some studies have suggested that the Maylard incision is more time consuming than other transverse incisions and confers an increased risk of hematoma resulting from division of the epigastric arteries. Prolonged operative time is associated with an increase in estimated operative blood loss.

Lee-Parriz [4] suggested that cost-effectiveness is a crucial factor when performing any surgery in young women. The author also compared the beneficial effects of the transverse muscle-cutting Maylard incision and the Pfannenstiel incision and showed that the Maylard incision was associated with less postoperative pain, measured by VAS. This is in accordance with the results of the present study, which showed that fewer women in the Maylard group required additional analgesia.

Giocalone et al [7] found no differences in outcomes such as pain and hemorrhage following the two types of incision. Similarly, no differences in side effects or outcomes were found between the two groups in our study. Patient satisfaction was similar in the two groups at 3 months after surgery. The evaluation of operative times confirmed that, regardless of incision placement, operative time increased with increasing patient weight.

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