Pregnancy Outcomes After Myomectomy With Polytetrafluoroethylene Placement

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ABSTRACT

Background and Objectives: The aim of this study was to report preliminary data on pregnancy outcomes after myomectomy with placement of an expanded polytetrafluoroethylene adhesion barrier membrane.

Methods: In this retrospective case series, 68 women who underwent myomectomy with expanded polytetrafluoroethylene membrane placement between January 1, 2003, and December 31, 2009, were identified. Of these women, 15 subsequently had documented pregnancies and were included in the final dataset.

Results: Eighteen pregnancies were documented among 15 women. There were no reported cases of preterm labor, preterm premature rupture of membranes, or uterine rupture.

Conclusion: In this case series, there were no documented cases of preterm labor, preterm premature rupture of membranes, or uterine rupture after myomectomy with expanded polytetrafluoroethylene membrane placement.

Key Words: Adhesion barrier, Leiomyoma, Myomectomy, Pregnancy outcomes.

INTRODUCTION

Peritoneal adhesions are a common sequela of abdominal and pelvic surgery, with an estimated prevalence of 60% to 95%.1–3 Potential consequences of adhesions include intestinal obstruction, chronic pelvic pain, and infertility.4–6 Given the high prevalence of postoperative adhesions and the severity of associated complications, adhesion barriers are commonly placed after major gynecologic surgery. Expanded polytetrafluoroethylene (ePTFE) (Gore Preclude; W. L. Gore & Associates, Flagstaff, Arizona) is a thin (0.1-mm) adhesion barrier membrane that may be permanently sutured to the uterus after myomectomy.7 Evidence suggests that the incidence of postmyomectomy adhesions is decreased after placement of ePTFE compared with no adhesion barrier.7 Furthermore, ePTFE has been shown to be more effective than oxidized regenerated cellulose (Interceed TC7; Johnson & Johnson Medical, Arlington, Texas) in the prevention of pelvic sidewall adhesions.8 The use of ePTFE, however, has been limited because of its permanence and theoretical need for removal.9 The necessity of membrane removal has been questioned in the literature, and there are currently no data to support this practice.10,11

At our academic center, ePTFE is not routinely removed after placement at the time of myomectomy. Given its permanent nature, it is possible that the risk of obstetric complications might be increased among women who subsequently become pregnant. Therefore the objective of this study was to provide important preliminary data on obstetric complications after myomectomy with placement of an ePTFE membrane. Specifically, we aimed to determine the proportion of women who subsequently had preterm labor, preterm premature rupture of membranes (PPROM), or uterine rupture.

MATERIALS AND METHODS

The study was approved by the Northwestern University Institutional Review Board. All women who underwent myomectomy with ePTFE membrane placement between January 1, 2003, and December 31, 2009, at Prentice Women’s Hospital were identified. Those with documented pregnancies after surgery were included in the final dataset.
Preoperative uterine size was determined by pelvic examination. Total fibroid weight in grams was measured by the pathologist. Myomectomies were performed by laparotomy or were laparoscopically assisted. All procedures were performed with patients under general endotracheal anesthesia. Dilute vasopressin (5 U in 20 mL of normal saline solution) was infiltrated in the subserosal plane overlying each myoma. The pseudocapsule was scored transversely electrosurgically, and each myoma was enucleated with blunt and sharp dissection. In laparoscopically assisted cases, excision and morcellation were performed laparoscopically and the uterus was repaired by mini-laparotomy. If entered, the endometrium was reapproximated. The myometrium was closed with at least 2 but more commonly 4 layers of delayed absorbable suture, and the serosa was reapproximated with a baseball stitch. An ePTFE membrane was then cut to size, positioned over the serosal incisions, and fixed at the periphery with 4 to 8 interrupted stitches of No. 6–0 nylon (Ethilon; Ethicon Endo-Surgery, Somerville, New Jersey) or polypropylene (Prolene; Ethicon Endo-Surgery) suture. Second-look surgical procedures to remove the membrane were not performed.

Delivery records of patients with subsequent pregnancies were obtained and used to calculate the proportion of deliveries complicated by preterm labor, PPROM, or uterine rupture. Among women who underwent cesarean delivery, the presence or absence of adhesions and/or residual ePTFE membrane was determined from the operative reports.

RESULTS

Sixty-eight women underwent myomectomy with ePTFE membrane placement by 6 surgeons at our institution during the study period. Within this study population, 18 pregnancies were subsequently documented among 15 women. Patient demographic data and operative characteristics are displayed in Table 1. Of the myomectomies, 14 (93.3%) were performed abdominally and 1 (6.7%) was laparoscopically assisted. Two patients (13.3%) had undergone previous hysteroscopic myomectomy; none had a history of laparoscopic or abdominal myomectomy. One patient (6.7%) had a history of cesarean delivery.

On average, the age at delivery or spontaneous abortion was approximately 3 years higher than that at myomectomy (Table 2). Most deliveries were performed by cesarean section (Table 2). The patient with a history of cesarean delivery delivered vaginally. There were no documented cases of preterm labor, PPROM, or uterine rupture among any of the women who delivered. Adhesions were encountered in 6 of the 9 primary cesarean sections (66.7%). Two of the 6 women with adhesions subsequently underwent repeat cesarean section. One of the repeat cesarean sections was complicated by severe adhesions and intraoperative bleeding, necessitating emergency right salpingo-oophorectomy. Interestingly, the ePTFE membrane was noted to be in place during both of this patient’s cesarean deliveries. Only 1 other patient had residual ePTFE membrane seen at the time of primary cesarean section; however, adhesions were also noted.

DISCUSSION

This retrospective case series showed no cases of preterm labor, PPROM, or uterine rupture after myomectomy with permanent ePTFE membrane placement. Two-thirds of patients had adhesions noted at the time of cesarean section, but the majority had no residual ePTFE membrane.

Few published studies have examined the influence of adhesion barrier placement on pregnancy outcomes.
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ure; however, in prior studies second-look laparoscopy
This finding has not been reported in the existing litera-
ePTFE membrane visible at the time of cesarean delivery.
Interestingly, most patients in our study had no residual
 placed in the posterior cul-de-sac. Therefore the stillbirth
not likely related to ePTFE placement. Among the 22
women who delivered live infants, 10 had uterine ePTFE
implantation sites. Of these women, 2 delivered vaginally
and 8 delivered by cesarean section. As in our study, there
were no documented complications.
Sawada et al12 examined pregnancy outcomes in 38 infertil-
ty patients who underwent myomectomy, ovarian cyst-
tectomy, tuboplasty, or ureteroplasty. Oxidized regener-
ated cellulose was placed in 23 cases, whereas no
adhesion barrier was used in 15 cases. After surgery,
78.3% of women in the adhesion barrier group became
pregnant compared with 46.7% of women in the non-
adhesion barrier group. Obstetric outcomes, however,
were not evaluated.
In our study two-thirds of women had adhesions noted at
the time of primary cesarean delivery. One of these
women subsequently underwent repeat cesarean section
complicated by bleeding and right salpingo-oophorec-
tomy; the bleeding was attributed to severe adhesions.
The high prevalence of postmyomectomy adhesions in
our study is comparable with published data on myome-
tomy without adhesion barrier placement.13 In contrast, a
randomized controlled trial reported adhesion formation
in only 44.4% of uterine incisions covered with ePTFE
compared with 92.6% of incisions with no ePTFE.7 Other
studies have reported an adhesion prevalence of only 30%
to 40% after ePTFE placement; however, these studies
included gynecologic surgeries with a lower risk of adhe-
sion formation than myomectomy.11,12

Interestingly, most patients in our study had no residual
ePTFE membrane visible at the time of cesarean delivery.
This finding has not been reported in the existing litera-
ture; however, in prior studies second-look laparoscopy
was performed within 1 to 6 weeks after the initial sur-
gery.7,8 This is in contrast to our study, in which a mean of
3 years elapsed between myomectomy and cesarean de-
ivery. Our data suggest either that the membrane may
migrate over time or that visceral peritoneum may grow
over its surface, obscuring visualization of the membrane.
It is also possible that some delivering physicians failed to
describe the ePTFE in their operative reports.
One potential barrier to the use of ePTFE is the need for
suturing of the material to the uterus, which makes it
impractical for use during laparoscopic or robotic myo-
metomy. At our institution, we have only used ePTFE for
abdominal myomectomies or rare laparoscopically as-
sisted procedures in which the hysterotomy is closed
through a mini-laparotomy incision. Of the 15 patients in
this study, the majority underwent abdominal myomec-
tomy. Laparoscopically assisted myomectomy was per-
formed in 1 patient, for whom a proper laparoscopic
multilayer hysterotomy closure could not be performed
because of the size and location of the fibroid. More
typically, we laparoscopically reapproximate the hyster-
otomy with multiple layers of suture and apply a polyeth-
ylene glycol adhesion barrier (GoSeal; Baxter Healthcare,
Deerfield, Illinois).
This case series provides important preliminary data re-
garding obstetric complications after myomectomy with
ePTFE placement. To our knowledge, only 1 other study
has examined this relationship.11 The limitations of our
study include its retrospective case-series design, by def-
inition lacking a control group. As mentioned previously,
it is possible that details were missing from the operative
reports obtained retrospectively. Furthermore, our sample
size was small and limited by our inability to access
obstetric records of women who delivered at other insti-
tutions. Obtaining the external medical records of the
other 53 women would certainly strengthen our findings.
Unfortunately, because of the retrospective nature of the
study and waiver of informed consent, it was not possible
to obtain those records.
In summary, this retrospective case series showed no
cases of preterm labor, PPROM, or uterine rupture after
myomectomy with ePTFE membrane placement. Among
women who subsequently delivered by cesarean section,
the prevalence of adhesions was high despite the place-
ment of an adhesion barrier.

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