GENERAL GYNECOLOGY

Endometrial ablation: postoperative complications

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Endometrial ablation as a treatment for abnormal uterine bleeding has evolved considerably over the past several decades. Postoperative complications include the following: (1) pregnancy after endometrial ablation; (2) pain-related obstructed menses (hematometra, postablation tubal sterilization syndrome); (3) failure to control menses (repeat ablation, hysterectomy); (4) risk from preexisting conditions (endometrial neoplasia, cesarean section); and (5) infection. Physicians performing endometrial ablation should be aware of postoperative complications and be able to diagnose and provide treatment for these conditions.

Key words: complications, endometrial ablation, hysteroscopy, infection

Endometrial ablation as a treatment for abnormal uterine bleeding has evolved considerably over the past several decades. In the early era of manual resectoscopic endometrial ablation (REA), the energy source options were laser fiber or rollerball/rollerbarrel electrodes to desiccate the endometrium or a loop electrode to resect the endometrium. Inherent in the evolutionary process are unintended consequences. Unfortunately, the use of energy sources and intrauterine distending media resulted in intraoperative complications that were in some cases life threatening and, in rare cases, life ending.[1]

As technology advanced, automated systems were designed and termed nonresectoscopic endometrial ablation (NREA) devices, global endometrial ablation devices, or second-generation endometrial ablation devices. Although these systems obviated the need for manual resectoscopic skills and fluid management systems, intraoperative complications still occurred but of differing types. These newer technologies include 5 ablative methods including a thermal balloon, circulated hot fluid, cryotherapy, radiofrequency electrosurgery, and microwave energy. All 5 methods have been compared with rollerball endometrial ablation by way of randomized clinical trials and are in general associated with similarly high patient satisfaction rates (86–99%), regardless of the method, but with wide ranges of amenorrhea rates (13.9–55.3%).[2]

Although these 2 categories of ablation methods (REA and NREA) may have different types of intraoperative complications, they have fairly similar postoperative complications. As is common with all forms of endometrial ablation, the entirety of the endometrium is rarely destroyed. As a result, complications can occur because the residual endometrium may allow implantation of an embryo, cause continued bleeding that may become obstructed, unobstructed but enough to be considered a failure, or may develop neoplasia. Therefore, the goal of this review was to focus on 5 categories of postsurgical complications including the following: (1) pregnancy after endometrial ablation, (2) pain-related obstructed menses (hematometra, postablation tubal sterilization syndrome), (3) failure to control menses (repeat ablation, hysterectomy), (4) risk from preexisting conditions (endometrial neoplasia, cesarean section), and (5) infection. Intraoperative complications such as fluid overload, uterine perforation, and hemorrhage will not be addressed in this article.

Pregnancy-related complications

The issue of contraception is one of the most significant issues that should be addressed in patients considering endometrial ablation. Endometrial ablation is not considered a form of contraception. Unfortunately, although pregnancy after endometrial ablation is associated with significant maternal and fetal morbidity and mortality, the performance tubal sterilization also carries a risk for complications such as post blation tubal sterilization syndrome (see section in the following text).

Pregnancy has been reported to occur in 0.7% of women who have undergone endometrial ablation.[3] Pregnancy has been reported as early as 5 weeks after ablation[4] and as late as 12 years postoperatively (with subsequent tubal reanastamosis in a planned pregnancy).[5] The chance of pregnancy occurring after endometrial ablation and tubal sterilization is estimated to be 0.002%, or 1 in 50,000.[6] Pregnancy has also been reported in an amenorrheic woman.[7] Successful pregnancies have been reported; however, there appears to be a greater risk of complications in pregnancies that follow endometrial ablation including preterm birth, intrauterine scarring/uterine chambering (creating separate uterine compartments), and postpartum hemorrhage.[8,9] The authors have hypothesized that the preterm labor is in part because of narrowing or sometimes chambering of the endometrial cavity resulting in a smaller area for gestation.

There are several reviews of pregnancy occurring after endometrial ablation, evaluating many of the same cases from the available literature and also adding information from their own case series while updating the cumulative number of pregnancies after endometrial ablation (n = 134).[10-12] This type of data

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(level III evidence) offers only limited confidence in making recommendations but does provide a reasonable platform for counseling patients and for anticipating potential complications.

For patients presenting in the first trimester, these series report at least a 28% miscarriage rate and an ectopic pregnancy rate of up to 6.5%. This may not be a significant increase over the baseline miscarriage rate, considering unrecognized or subclinical pregnancies; however, with a risk for ectopic pregnancy that is approximately 3 times baseline (approximately 2%), this would warrant a recommendation that ectopic pregnancy precautions be followed. The miscarriage rate may be higher because nearly half of the women in these series terminated their pregnancy, some of which would likely have aborted spontaneously.

In patients continuing a pregnancy past the viability range of 24 weeks, the larger series[12] reported a 31% risk of prematurity, a 16% risk of preterm premature rupture of membranes, a 25% risk of abnormal placentation (accreta spectrum), and a cesarean delivery rate of 44%. All of these complications occur more frequently than the general US population statistics in pregnancy. Approximately 60% of patients with abnormal placentation underwent hysterectomy at the time of delivery.[12] Amniotic band syndrome and spontaneous uterine rupture have also been reported with severe fetal arthrogryposis and scoliosis reported in some cases.[13,14] Ultrasonography might identify uterine synechiae, which are common after endometrial ablation. Cornual uterine rupture has been reported in a 27-week gestation with the use of radiofrequency ablation.[14] In this case, the patient experienced at prior midline fundal uterine perforation that would not explain the cornual location for rupture.

Firm pregnancy management recommendations are difficult to establish based on limited data. However, the currently available data would suggest that patients should be managed as though they are a higher risk for preterm birth. Some authors have suggested that treatment with 17-hydroxyprogesterone is justified[8] and have followed up with patients with serial ultrasonography because of the potential risk of intrauterine growth restriction. Because of the relatively high risk of abnormal placentation and cesarean delivery, having personnel experienced in cesarean hysterectomy and having access to a hospital with adequate blood banking services should be considered.

Pain-related obstructed menses

When energy is applied to the endometrium, tissue necrosis and inflammation can result in uterine contracture and intrauterine scarring. This has been demonstrated with both resectoscopic endometrial ablation as well as newer devices.[15-17]

Persistent endometrium after endometrial ablation is common as evidenced by clinical, imaging, and histologic studies. As mentioned previously, randomized clinical trials have shown amenorrhea rates to be generally less that 50%, suggesting persistent endometrial glands after endometrial ablation. Magnetic resonance imaging (MRI) studies have shown endometrial tissue to be present in up to 95% of patients undergoing rollerball ablation including patients with amenorrhea.[18] In a comparative study of long-term histologic findings (more than 30 months) after rollerball ablation ($n = 21$) and endometrial resection ($n = 24$), hysteroscopy showed similar areas of persistent endometrium at the uterine fundus and cornual regions.[19] Contracture and scarring in the presence of persistent endometrium can result in obstructed egress of menses. This can manifest as hematometra within the body of the uterine cavity (central hematometra) or at the cornual region.

Postablation tubal sterilization syndrome (PATSS) was initially reported in 1993 as a series of 6 patients presenting with unilateral or bilateral pelvic pain and vaginal spotting who had previously undergone tubal sterilization and endometrial ablation.[20] The patients were noted to have endometrial cavity scarring with one or both swollen proximal fallopian tubes. Symptom relief was reported in 5 of 6 patients with removal of the fallopian tubes. The incidence of PATSS is approximately 6-8% and usually develops 2-3 years after endomemtrial ablation.[21-23] The mechanism of pain in PATSS is thought to be retrograde menstruation of cornual hematometra against an obstructed fallopian tube, causing visceral distention. It has also been associated with newer ablation devices.[24]

The definitive treatment of PATSS is hysterectomy.[25] Hysteroscopic lysis of adhesions is possible but difficult to perform in the vulnerable cornual regions and will not reliably alleviate potential future bleeding against the proximal fallopian tube. As mentioned, in the original description of this syndrome, the authors performed salpingectomies[20]; however, currently some of those authors are suggesting hysterectomy as a better and more definitive treatment for this condition.[22]

The diagnosis of PATTS is initially suspected clinically in patients with cyclic cramping with or without menses with a history of endometrial ablation and tubal sterilization. Usually the confirmatory diagnosis is made surgically; however, MRI imaging during times of symptomatic cramping may be useful using T2-weighted images looking for blood trapped in the cornu. Ultrasound has not been reliably sensitive at diagnosing PATSS.

Preventing PATTS is challenging. When performing resectoscopic endometrial ablation, the cornu is particularly challenging because of the thin muscular density in that region that poses increased risk for perforation. Laparoscopic devices such as bands and clips are not designed for the first centimeter of the fallopian tube, and fulguration should be performed in the midportion of the fallopian tube rather than the proximal portion because of the risk of fistula formation.

Transcervical sterilization devices (Essure; Conceptus Inc, San Carlos, CA. Adiana; Hologic Inc, Marlborough, MA) have now been approved by the Food and Drug Administration. Whether these devices will prevent PATSS is unknown; however, neither of these devices should be used concomitant with endometrial ablation because of the potential for intrauterine synechiae, which can compromise the 3 month confirmation test (hysterosalpingogram).[26] If endometrial ablation is to be used after a tran-