GENERAL GYNECOLOGY

Recent advances in second-trimester abortion: an evidence-based review

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The proportion of US abortions performed in the second trimester has varied little since 1992. Although 30 years of cumulative data corroborate the safety of dilation and evacuation (D&E), the most commonly used method of second-trimester abortion in the United States, both D&E and alternative induction regimens continue to evolve such that the traditional safety gap between medical and surgical regimens has narrowed. Providers now have options that allow them to either expedite D&E by diminishing the cervical-ripening period or reduce induction abortion intervals during medical induction.

Key words: abortion, mifepristone, misoprostol, pregnancy termination, second trimester

More than 20 years ago, Dr Elizabeth B. Connell,[1] a contributing author in the text *Second Trimester Abortion: Perspectives after a Decade of Experience* wrote ". . .there is no reason, logically speaking, that second-trimester abortion should not join bubonic plague and poliomyelitis as practically historic medical conditions." Dr Connell[1] predicted that within the coming decade the use of more effective contraceptives and increased access to first-trimester abortion would make second-trimester abortion obsolete–a "therapeutic memory" rather than a "medical reality." Now, > 2 decades later, her vision seems no more probable than the end of poverty, hunger, or taxes. Second-trimester abortion comprises 10-15% of the 42 million abortions that occur worldwide each year.[2] The proportion of US abortions performed in the second trimester has varied little since 1992. According to surveillance data from the Centers for Disease Control and Prevention (CDC), 12% of abortions occur at or after 13 weeks' gestation. In all, 3.7% of all abortions occur at 16-20 weeks and 1.3% at ≥ 21 weeks.[3] Although second-trimester terminations represent a small percentage of total abortions, they still account for approximately 130,000 procedures annually in the United States.[4]

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★ EDITORS' CHOICE ★

It is reasonable to ask why the prediction of Dr Connell[1] has proved so elusive. In part, it is because her underlying premise that women would use effective contraception and access first-trimester abortion services has failed to materialize. Approximately 50% of all pregnancies in the United States are unintended and roughly 50% of unintended pregnancies are terminated. Although some second-trimester abortions occur because of maternal disease and fetal anomalies, the majority occur because of delay in obtaining first-trimester abortion in unintended pregnancies. At one large US public hospital, 58% of patients having second-trimester procedures were already beyond the first trimester by the time they obtained a pregnancy test. Second-trimester patients were less certain of their last menstrual period, had fewer pregnancy-related symptoms, and were *more* likely to report recent use of hormonal contraception than other patients.[5] Finer et al[6] reported similar findings in their evaluation of the reasons for delay in accessing abortion services. Second-trimester patients required more time to make arrangements for abortion (59%), more time to diagnose pregnancy (36%), and more time to decide whether to terminate (39%) than first-trimester patients. Difficulty securing financial resources– or finding a provider who accepted a particular insurance coverage–impeded many women's efforts to secure timely abortion. Ironically, legislation such as the Hyde Amendment, which has since 1977 forbidden the use of federal funds for abortion, continues to increase the need for second-trimester abortion services.

Although second-trimester abortion accounts for a relatively small proportion of all induced abortions, it is associated with disproportionate morbidity. Two-thirds of major abortion-related complications and half of abortion-related mortality occur in pregnancies terminated after 13 weeks of gestation, most commonly in countries that restrict access to safe abortion.[7] In countries with legal abortion, the risk of complications from second-trimester abortion–both medical and surgical–is low. How to perform abortion in the second trimester, particularly whether to induce labor or surgically evacuate the uterus, remains subject to regional variations that derive as much from custom and training as medical evidence. Although the old adage "If it isn't broke, don't fix it" might facilitate the continued delivery of safe abortion services, failure to implement new evidence-based practices denies patients and providers access to the full range of surgical and medical options now available throughout the second trimester.

Surgical abortion

Historical background

Dilation and evacuation (D&E), the most prevalent method of second-trimester pregnancy termination in the United States, accounts for > 98% of all second-trimester abortions.[8,9] Despite its general acceptance in the United States and 30 years of data confirming its safety, D&E remains a relatively recent surgical innovation that continues to evolve.

In 1973, limited data existed to compare the relative safety advantages of D&E vs medical abortion or hysterotomy in the second trimester. Data from the Joint Program on the Study of Abortion, a prospective chart review of thousands of abortions cosponsored by The Population Council and the CDC during the 1970s, suggested lower rates of hemorrhage and infection with D&E compared with other methods used at the time.[10] Indeed, patients undergoing abortion through instillation of urea or hypertonic saline experienced twice the rate of major complications than patients undergoing D&E.[11] As a result, the proportion of US abortions performed by D&E at ≥ 13 weeks' gestation increased from 31% in 1974 to 97% in 2004, whereas the percentage of abortions performed by intrauterine instillation at ≥ 13 weeks' gestation decreased from 57-0.5% during the same time period.[3] Observational data and several retrospective cohort trials in the 1980s consistently confirmed the safety advantages of D&E vs medical induction throughout much of the second trimester.[12-14] These studies included comparison with older induction agents, such as oxytocin, prostaglandin (PG) $F_{2\alpha}$, and urea.

Mortality with D&E abortion has remained constant since the 1980s. Lawson et al[15] from the CDC noted a reduction from 10.4 deaths per 100,000 cases between 1972 and 1976 to 3.3 deaths per 100,000 cases between 1977 and 1982. Unfortunately, the CDC cannot calculate national abortion case-fatality rates for 1998-2002, the most recent study interval, because a substantial number of the abortions occurred in states not reporting data to the CDC. Thus, the total number of abortions, or denominator, is unknown. Nevertheless, only 10 US women died as a result of complications among the roughly 850,000 induced abortions reported to CDC in 2004, the vast majority of those procedures accomplished by D&E.[3] This favorably compares with overall maternal mortality of roughly 12.1 maternal deaths per 100,000 live births.[16]

Recent trials further document the general safety of D&E, including its impact on subsequent pregnancy outcome. In a retrospective review by Kalish et al[17] of 600 patients undergoing D&E between 14 and 24 weeks, the overall rate of preterm birth in subsequent pregnancies was less than the overall rate of preterm birth for the general US population (6.5% vs 12.5%). Similarly, Jackson et al[18] compared subsequent pregnancy outcomes among 317 women undergoing second-trimester D&E with 170 matched control subjects who had experienced viable pregnancies without midtrimester D&E. Although patients with a history of prior D&E delivered slightly earlier in gestation than control subjects (38.9 vs 39.5 weeks' gestation; $P = .001$) there was no statistically significant difference in birth weight, spontaneous preterm delivery, abnormal placentation, or overall rates of perinatal complications.

In addition to safety, surgical abortion offers many perceived advantages compared with medical abortion. D&E affords both patients and clinicians more predictable procedure timing. The patient typically undergoes between 1 and 2 days of preoperative cervical preparation with osmotic dilators, chemical ripening agents, or a combination of the 2. Experienced clinicians can accomplish D&E in < 30 minutes as an outpatient procedure, and patients commonly return to work the day after the procedure. Many patients find that the predictability of surgical abortion and avoiding the memory of prolonged labor make D&E less emotionally burdensome than induction abortion.[19-21] D&E can also present less of a financial burden, particularly when performed in an out-of-hospital setting.[22] Finally, the controlled timing and predictability of D&E can offer medical benefits for patients with specific types of medical compromise.

When Grimes et al[23] attempted to perform a randomized clinical trial comparing D&E with medical induction, 62% of women did not consent to randomization because of the many apparent advantages of D&E. Unfortunately, many women in the US have little choice in method of second-trimester termination because of impaired access to second-trimester surgical abortion services. The most critical requirement for any safe D&E program is a surgeon skilled and experienced in D&E provision. Many of the most skilled providers will soon reach retirement age and it is unclear whether a new generation of trained providers will replace them. A national survey of obstetrics and gynecology residency program directors found that 51% of programs offered routine abortion training compared with only 12% in 1992. In programs offering routine training, however, most (64%) trained less than half of their residents in D&E techniques, and very few offered the volume of procedures necessary to attain competence.[24] The recent development of Ryan Training Programs, to assure resident training in comprehensive abortion services, and family planning fellowships, to create an academic subspecialty committed to training and providing comprehensive family planning services, both offer hope that US women will retain access to such a safe and convenient method of uterine evacuation.

Recent advances

Unfortunately, the performance of D&E at later gestational ages often requires multiple sets of osmotic dilators over multiple days increasing the financial burden related to travel, lodging, and time missed from work.[25] To address this issue, during the past decade, providers have increasingly used misoprostol, a synthetic PG E_1 analogue, either as a sole ripening agent or as an adjunct to traditional mechanical and osmotic dilation.

Although many studies document the safety and efficacy of misoprostol preceding first-trimester aspiration proce-