



EDITORS' CHOICE

Dilation and evacuation at ≥ 20 weeks: Comparison of operative techniques

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KEY WORDS

Abortion
Dilation and evacuation

Objective: The objective of this study is to compare the relative safety of 2 techniques for surgical abortion late in the second trimester.

Study design: Retrospective review of patients who underwent surgical abortion at ≥ 20 weeks' gestation at our hospital from June 1996 through June 2003. Records were reviewed to determine whether the technique used was dilation and evacuation or intact dilation and extraction. Subsequent pregnancies at our hospital were identified, and obstetric outcomes were recorded. Categorical data were compared with Fisher exact test and χ^2 analysis. Continuous data were compared with Mann-Whitney *U* test.

Results: Three hundred eighty-three patients met inclusion criteria. Intact dilation and extraction was performed in 120 cases, and dilation and evacuation was used in 263. Intact dilation and extraction was associated with higher parity, later gestational age, and more preoperative cervical dilation. There was no difference in procedure time or estimated blood loss in the 2 groups. Complications occurred in 19 cases (5.0%), and occurred with similar frequency in the 2 groups. We identified 62 subsequent pregnancies. There were no second-trimester miscarriages. Spontaneous preterm birth occurred in 2 of 17 (11.8%) pregnancies in the intact dilation and extraction group, compared with 2 of 45 (4.4%) in the dilation and evacuation group ($P = .30$).

Conclusion: Outcomes appear similar between patients undergoing dilation and evacuation and intact dilation and extraction after 20 weeks' gestation. Subsequent obstetric outcomes are similar between the 2 groups. The technique for surgical abortion should be determined by the physician on the basis of intraoperative factors.

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In the United States, induced abortion late in the second trimester is uncommon. In 1999, 9643 abortions were performed at ≥ 21 weeks' gestation, representing only 1.5% of total abortions reported.¹ Dilation and evacuation is the most common method used for second

trimester abortion¹ and is considered the safest abortion technique in the second trimester.²⁻⁵

Dilation and evacuation involves preoperative dilation of the cervix with osmotic dilators, such as laminaria, which are placed in the cervix for 1 or more days before operative evacuation. All published reports of dilation and evacuation have described the use of grasping forceps to remove the fetus and placenta. With the use of forceps, fetal parts are grasped, and the fetus and

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placenta are disarticulated as they are removed. Low complication rates for this procedure have been reported.²⁻⁵

A variant of dilation and evacuation can be performed when sufficient cervical dilation is present. In these cases, the fetus is delivered via breech extraction. If the fetus is not in the breech presentation, internal podalic version may be performed. In most cases, after delivery of the body, the fetal head will become lodged in the cervix, and cranial decompression with suction must be performed to complete delivery. This procedure has been referred to as intact dilation and extraction, or D&X. There are no published data regarding the frequency or complication rate of this procedure. Despite this, some have stated that this procedure poses serious maternal risks and is less safe than dilation and evacuation.^{6,7}

The objective of this study is to evaluate the relative safety of dilation and evacuation and intact D&X in patients undergoing surgical abortion late in the second trimester.

Materials and methods

This study was a review of patients who underwent surgical abortion at ≥ 20 weeks' gestation at the New York Weill Cornell Medical Center from June 1996 to June 2003. All procedures included in this study were performed by 1 of 2 physicians (S.T.C. and W.K.R.) who are skilled in both techniques, dilation and evacuation and intact D&X. Institutional Review Board approval was obtained for this study.

Gestational age was confirmed by ultrasound in all cases. All cases ≥ 24 weeks' gestation were performed because of fetal demise. Dilation of the cervix was achieved with insertion of laminaria. Laminaria were placed preoperatively on 2 consecutive days, unless the cervix was sufficiently dilated at the initial examination. Women who went into labor after laminaria placement and delivered without dilation and evacuation or intact D&X were not included in this study.

The surgical technique was determined when the patient was examined under anesthesia, and was based on cervical dilation and fetal position. Both physicians performing these procedures used similar criteria in determining the optimal surgical technique. All cases were considered complete when, after evacuation of the fetus and placenta, hemostasis was apparent after sharp and suction curettage. Blood loss was estimated by the surgeon. Procedures were performed in an ambulatory setting, unless patients had been hospitalized before the procedure for medical or obstetric conditions. The type of anesthesia used for the procedure, general, regional, or intravenous sedation, was at the discretion of the anesthesiologist. Intraoperative ultrasound guidance was not routinely used.

Operative reports were reviewed to determine the technique used in each case. If the fetus was delivered intact in the breech presentation to the level of the umbilicus or higher, the procedure was considered an intact D&X, whether the entire fetus was removed intact or decompression of the head was required. In some cases, the presenting fetal head was well applied to the cervix and was initially decompressed with suction, followed by intact delivery of the fetus. These cases were also considered intact D&Xs, as disarticulation with forceps was not required. All other cases, which were performed with multiple insertions of forceps, were categorized as dilation and evacuation.

Complications included any situation requiring unplanned intervention. These included unplanned hospital admission, repair of any genital tract lacerations, return to the operating room for additional procedures, and blood transfusion. Subsequent pregnancies at our hospital were identified from a review of the medical records. We did not obtain follow-up on patients routinely, so subsequent pregnancies with prenatal care obtained elsewhere were not included in this analysis. Thirty-eight patients in this series, 26 of whom underwent dilation and evacuation and 12 of whom underwent intact D&X, were included in a prior publication describing obstetric outcome after second trimester abortion.⁸

Demographic characteristics and outcomes were compared on basis of operative technique. Categorical variables were analyzed with the use of 2-tailed Fisher exact test and χ^2 analysis where appropriate. Mann-Whitney *U* test was used to analyze continuous variables, which were not normally distributed. Analysis was performed with SPSS 11.0 (Chicago, Ill). A *P* value $< .05$ was considered significant.

Results

Three hundred eighty-three patients met inclusion criteria. Intact D&X was performed in 120 cases (31.3%), and dilation and evacuation was used in 263 (68.7%). Demographic characteristics of the 2 groups are listed in Table I. Intact D&X was associated with later gestational age, higher parity, and younger maternal age.

Indications for surgical abortion are listed in Table II. Preterm cervical dilation and/or preterm premature rupture of membranes (PPROM) were more common in those who underwent intact D&X. Abnormal fetal karyotype was more common in those who underwent dilation and evacuation.

Intraoperative variables are listed in Table III. Overall, laminaria were used in 96.1% of cases. Laminaria were less likely to be used in patients undergoing intact D&X. All 15 patients in whom laminaria were not used had preterm cervical dilation. Preoperative cervical dilation was greater in those who underwent intact D&X.

Table I Demographic characteristics of patients undergoing dilation and evacuation

	D & E (n = 263)	D & X (n = 120)	P value
Median maternal age (range)	34 y (16-45)	32 y (12-43)	.01*
Median parity (range)	0 (0-7)	1 (0-5)	.04*
Median gestational age at D & E (range)	21 wks (20-27)	23 wks (20-25)	<.001*
Prior vaginal delivery	81 (30.8%)	50 (41.7%)	.05 [†]
Prior cesarean delivery	49 (18.6%)	26 (21.7%)	.49 [†]
Multifetal pregnancy	13 (4.9%)	8 (6.7%)	.48 [†]

D & E, Dilation and evacuation.

* Mann Whitney U test;

[†] Fisher exact test.**Table II** Indication for dilation and evacuation*

Indication for D & E	D & E (n = 263)	D & X (n = 120)	P value [†]
Abnormal fetal karyotype	112 (42.6%)	33 (27.5%)	.005
Structural fetal abnormality	96 (36.5%)	47 (39.2%)	.65
Intrauterine fetal demise	27 (10.3%)	14 (11.7%)	.72
Premature cervical dilation/PPROM	14 (5.3%)	20 (16.7%)	.001
Other	22 (8.4%)	13 (10.8%)	.45

* Some patients had more than 1 indication;

[†] Fisher exact test.**Table III** Intraoperative variables

	D & E (n = 263)	D & X (n = 120)	P value
Laminaria	259 (98.5%)	109 (90.8%)	.001*
Median preoperative cervical dilation (range)	3 cm (0-6)	5 cm (2-10)	.001 [†]
Anesthesia			
General	92 (35.05%)	53 (44.2%)	.22 [‡]
Regional	9 (3.4%)	3 (2.5%)	
Local/conscious sedation	162 (61.6%)	64 (53.3%)	
Median procedure time (range)	22 min (6-60)	22 min (6-45)	.54 [†]
Median estimated blood loss (range)	100 mL (40-1500)	100 mL (20-1200)	.38 [†]

* Fisher exact test;

[†] Mann-Whitney U test;[‡] Chi-square analysis.

No differences were noted in procedure time or estimated blood loss between the 2 groups.

In the entire group of 383 patients, complications occurred in 19 cases (5.0%). Complications occurred with similar frequency in the dilation and evacuation and intact D&X groups (4.9% vs 5.0%; $P > .999$). The 6 complications occurring in the intact D&X group included 4 genital tract lacerations (3 cervical mucosal lacerations and 1 perineal laceration) noted and successfully repaired at the time of surgery; 1 case of excessive bleeding requiring the return to the operating room on the day of surgery for curettage; and 1 patient readmitted because of heavy bleeding on postoperative day 13 who underwent curettage for retained placenta.

Complications in patients undergoing dilation and evacuation included 4 genital tract lacerations (2 cervical lacerations and 2 labial lacerations) noted and successfully repaired at the time of surgery; 2 cases of excessive bleeding requiring the return to the operating room on the day of surgery (for curettage in 1 case, and repair of cervical lacerations in 1 case); 2 postoperative admissions for intravenous antibiotics because of endometritis; 1 admission for observation after excessive bleeding; and 1 admission because of severe nausea from general anesthesia.

Three patients, all of whom underwent dilation and evacuation, had complications requiring admission to the surgical intensive care unit. One patient, with a fetal demise, had an amniotic fluid embolus with disseminated intravascular coagulation requiring transfusion of blood and clotting factors. One patient was diagnosed with sepsis and pulmonary embolus. One patient had a uterine perforation at the site of a cesarean delivery scar and required exploratory laparotomy and blood transfusion.

Forty-five women (17.1%) in the dilation and evacuation group and 17 women (15.0%) in the intact D&X group had a subsequent pregnancy and received care at our medical center. There were no second-trimester spontaneous abortions in either group. Spontaneous preterm birth occurred in 2 of 17 (11.8%) pregnancies in the intact D&X group compared with 2 of 45 (4.4%) in the dilation and evacuation group ($P = .30$). Both spontaneous preterm births in the intact D&X group occurred in women at high risk for prematurity: one woman, who underwent intact D&X caused by PPRM at 23 weeks' gestation, subsequently delivered at 32 weeks, and the other underwent intact D&X at 23 weeks' gestation because of cervical incompetence with advanced cervical dilation, and subsequently delivered at 35 weeks.

Comment

On the basis of this series of 383 patients, surgical abortion late in the second trimester is a safe procedure. There were low rates of complications in procedures performed with either technique. As described in a prior publication,⁸ we did not see a high rate of spontaneous preterm birth in subsequent pregnancies in those who received obstetric care at our medical center.

Because this study was retrospective, we cannot state that one technique is superior to the other. Procedures performed with intact D&X occurred at later gestational ages and with more preoperative cervical dilation. Although more advanced gestation might be expected to increase complication rates, more preoperative cervical dilation might be expected to facilitate these procedures.

Differences between maternal age, gestational age, and indication for surgical abortion were noted between the 2 groups. The difference in gestational age may be due to changes in the cervix that occur as pregnancy progresses. With advancing gestation, the cervix may be more likely to respond to laminaria placement with greater dilation. Intact D&X requires more dilation, as the intact fetus cannot pass through a minimally dilated cervix. In addition, more women in the intact D&X group underwent abortion caused by premature cervical dilation or PPRM. The incidence of these conditions increases with advancing gestation, and the spontaneous cervical dilation occurring in these cases probably facilitated intact D&X.

The difference in maternal age is likely because of the higher rate of fetal aneuploidy in the dilation and evacuation group. Amniocentesis is typically performed at 16 to 18 weeks, and advanced maternal age is the most common indication. Most cases of fetal aneuploidy are identified by 20 weeks. This could explain why those in the dilation and evacuation group were older, and underwent abortion at earlier gestational ages.

Our approach of performing intact D&X when possible is intended to minimize the use of forceps in extracting the fetus. We believe that the use of forceps to grasp the fetus can cause inadvertent trauma to the uterine wall. At these gestational ages, evacuation of a fetus can require multiple insertions of forceps, and intact D&X avoids this. Though we believe our low complication rate validates our approach, we acknowledge that the retrospective nature of this study precludes us from concluding with certainty that intact D&X prevented adverse outcomes.

Another important limitation is the relatively small number of patients receiving prenatal care at our hospital in subsequent pregnancies. Most patients returned to their referring obstetrician for future obstetric care, and we were unable to assess subsequent pregnancy outcomes of patients delivered at other institutions. We believe that significant bias as a result would be unlikely, though we cannot be certain that outcomes in pregnancies followed at our hospital are representative of outcomes in all subsequent pregnancies. Though we are reassured by the low number of complications in subsequent pregnancies in both groups, we acknowledge our lack of power to conclude that subsequent pregnancy outcomes are not different.

Some have stated that intact dilation and extraction poses serious risks to the health of a woman beyond the risks associated with dilation and evacuation. Such putative risks include higher rates of cervical incompetence, uterine rupture, abruption, amniotic fluid embolism, and trauma to the uterus.^{6,7} We are not aware of any published data supporting these statements. In our patients, the overall rate of complications was comparable between those undergoing dilation and evacuation and intact D&X. No patient undergoing intact D&X experienced uterine rupture, amniotic fluid embolism, or required blood transfusion. Because our approach is to perform intact D&X when possible on the basis of cervical dilation and fetal position, it is unlikely that intact D&X could have been performed in these patients undergoing dilation and evacuation who experienced severe complications.

In conclusion, our data affirm that abortion after 20 weeks' gestation with intact D&X appears to have similar complication rates as dilation and evacuation when performed by experienced physicians. The observed complication rates and subsequent obstetric outcomes appear comparable between the 2 techniques. In accordance with the American College of Obstetricians and Gynecologists statement of policy,⁹ our data supports that the most appropriate technique for surgical evacuation of pregnancy after 20 weeks' gestation should be based on intraoperative factors. Attempts to regulate intact D&X on the basis of concern for maternal well-being cannot be supported by available evidence.

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