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Clinical Guidelines

Cervical preparation for second-trimester surgical abortion prior to 20 weeks' gestation

SFP Guideline #2013-4

Abstract

For a dilation and evacuation (D&E) procedure, the cervix must be dilated sufficiently to allow passage of operative instruments and products of conception without injuring the uterus or cervical canal. Preoperative preparation of the cervix reduces the risk of cervical laceration and uterine perforation. The cervix may be prepared with osmotic dilators, pharmacologic agents or both. Dilapan-S™ and laminaria are the two osmotic dilators currently available in the United States. Laminaria tents, made from dehydrated seaweed, require 12–24 h to achieve maximum dilation. Dilapan-S™, made of synthetic hydrogel, achieves significant dilation within 4 h and is thus preferable for same-day procedures. A single set of one to several dilators is usually adequate for D&E before 20 weeks' gestation. Misoprostol, a prostaglandin E_1 analogue, is sometimes used instead of osmotic dilators. It is generally regarded as safe and effective; however, misoprostol achieves less dilation than overnight osmotic tents. The literature supports same-day cervical preparation with misoprostol or Dilapan-S™ up to 18 weeks' gestation. As the evidence regarding alternative regimens increases, highly experienced D&E providers may consider same-day regimens at later gestations utilizing serial doses of misoprostol or a combination of osmotic and pharmacologic agents. Misoprostol use as an adjunct to overnight osmotic dilation is not significantly beneficial before 19 weeks' gestation. Limited data demonstrate the safety of misoprostol before D&E in patients with a prior cesarean delivery. Mifepristone, a progesterone receptor antagonist, is also effective for cervical preparation prior to D&E, although data to support its use are limited. The Society of Family Planning recommends preoperative cervical preparation to decrease the risk of complications when performing a D&E. Since no single protocol has been found to be superior in all situations, clinical judgment is warranted when selecting a method of cervical preparation.
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Keywords: Dilation and evacuation; Cervical dilation; Dilator; Laminaria; Dilapan; Lamicel; Misoprostol; Mifepristone; Cervical priming

This document revises and replaces the previous version, originally published in #2007-2. Approaches to cervical preparation prior to dilation and evacuation (D&E) have changed over the past 6 years, with increased emphasis on regimens that avoid overnight placement of osmotic dilators. These practice recommendations have been updated to reflect increasing evidence demonstrating the safety of regimens that accomplish cervical preparation and D&E within a single day. The use of Dilapan-S™ and misoprostol for cervical preparation on the same day as D&E has increased. Medical evidence now supports the use of misoprostol and Dilapan-S™ for cervical preparation on the same day as D&E as safe alternatives to overnight osmotic dilation up to 18 weeks' gestation. More recent studies support the safety of same-day cervical preparation before D&E at later gestations; however, the literature is limited. In addition, mifepristone is being evaluated as an alternative to overnight osmotic dilatation early in the second trimester.

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Background

Roughly 11% of abortions performed in the United States occur in the second trimester [1]. Pregnancies may be terminated in the second trimester by labor induction, D&E, hysterotomy and hysterectomy. Because D&E is safe, cost effective and efficient, it is the most common means of second-trimester abortion in the United States [2].

During D&E, the cervix must be dilated sufficiently to allow passage of operative instruments and fetal parts without injuring the cervical canal. The minimum dilation required to pass most forceps used for D&E ranges from 14 to 19 mm, although wider dilation is often required to remove products of conception at advanced gestations [3]. The cervical dilation needed for D&E increases with gestational age. Neither the minimal nor the ideal degree of dilation required for D&E at each gestational age has been determined.

Though the cervix may be mechanically dilated at the time of D&E, the degree of dilation needed for later procedures may require additional force, potentially increasing risk of cervical trauma and other complications. During D&E, perforation of the uterus occurs in 0.2–0.3% and cervical laceration occurs in 0–1% [4–6]. Insufficient cervical dilation is a strong predictor of major complications of D&E [7]. The risk of uterine and cervical trauma can be minimized with preoperative preparation of the cervix to achieve baseline dilation and softening [4–8].

The cervix may be prepared with osmotic cervical dilators (e.g., laminaria tents) or pharmacologic agents (e.g., misoprostol). Osmotic dilators are dehydrated rods placed in the cervical canal that absorb fluid within the cervix and slowly expand in situ to cause dilation. This expansion exerts radial pressure on the cervical canal, which, in addition to physical dilation, may induce prostaglandin synthesis that softens the cervix and makes subsequent mechanical dilation easier [9–12]. Two types of osmotic dilators are currently available in the United States: laminaria and Dilapan-S™. Table 1 compares the features of these products. In addition, the drugs misoprostol and mifepristone may be used as cervical priming agents prior to second-trimester surgical abortion.

Osmotic dilators: Laminaria, Dilapan-S™ and Lamicel®

Laminaria

The stems of the seaweed *Laminaria japonica* and *Laminaria digitata* are dehydrated and made into cervical tents that are then sterilized. Several suppliers currently manufacture laminaria tents in a range of sizes (Table 1). When placed, they may swell to 3–4 times their initial diameter. For example, a 3-mm laminaria tent achieves approximately 1 cm dilation in situ overnight [13–15]. Most of this dilation occurs in the first 6 h, although the maximum effect is not achieved for 12–24 h [9,16,17].

Since laminaria tents are made from natural resources, drawbacks include variability in the product, potential allergy and theoretical transmission of infection. There are no modern reports of laminaria tents transmitting infection, and numerous studies demonstrate that infectious morbidity is not increased by their use [18–21]. The greatest limitation of laminaria use for cervical preparation is the time required to achieve dilation, usually necessitating a 2-day abortion procedure. Faster acting synthetic dilators were developed to enable D&E to be performed in 1 day.

Table 1
Characteristics of currently available osmotic dilator tents: Laminaria [13] and Dilapan-S™ [22,23]

	Laminaria	Dilapan-S™
Diameter	2–10 mm	3 and 4 mm
Length	60–85 mm	55 and 65 mm
Time to minimal effect	6 h	2 h
Time to maximum effect	12–24 h	4–6 h
Maximum dilation achieved	3 times dehydrated diameter	4 times dehydrated diameter

Dilapan-S™

Dilapan-S™ is a synthetic osmotic dilator made of a polyacrylate-based proprietary hydrogel (Aquacryl) [22]. Tents come in two diameters and two lengths (Table 1). Compared to laminaria, Dilapan-S™ achieves cervical dilation in a shorter timeframe and rapidly swells to 3–4 times its initial diameter in situ. One 4-mm dilator can result in 7.8–10 mm or 10–11.2 mm of cervical dilation within 2 or 4 h, respectively. After 24 h, one 4-mm Dilapan-S™ expands to 12.7–14.6 mm [22,23]. Unlike laminaria, Dilapan-S™ shortens as it swells; thus, the longer 65-mm tent is recommended for most patients to ensure that the internal cervical os is adequately dilated [22–24].

Dilapan-S™ was designed with a stronger core than its predecessor (original Dilapan™) to decrease risk of tent fragmentation during removal. Although no published studies have addressed rates of fragmentation and other complications in the reformulated product, anecdotal reports suggest that dilator entrapment or fracture occur rarely.

Lamicel®

Lamicel®, another effective synthetic osmotic dilator, has not been manufactured since 2008.

Medications for cervical priming: Mifepristone and misoprostol

Over the past decade, there has been increased interest in preparing the cervix for D&E without overnight osmotic dilation. Many women find dilator insertion painful and anxiety producing. Patients, especially those traveling long distances for care, may prefer completing an abortion in a single day. In a randomized trial of same-day priming with misoprostol vs. overnight laminaria, women stated a strong preference for having their procedure completed in a single day [25]. Same-day regimens also have the potential to improve convenience and decrease expenses for both the patient and the provider. However, medical regimens may be more unpredictable in terms of the dilation achieved, the time needed to achieve adequate preparation and the risk of spontaneous delivery before D&E; thus, they may not be feasible or appropriate in some clinical settings.

Misoprostol

Misoprostol, an inexpensive prostaglandin E_1 analogue, is commonly used as an *off-label* alternative or adjunct to osmotic dilators prior to D&E. Side effects include cramping, nausea, vomiting, diarrhea, fever and chills. Doses range from 200 to 800 mcg, with 400 mcg being used most commonly. In the United States, misoprostol is labeled only for oral administration and approved solely for treatment of gastrointestinal disorders; however, when used *off-label* for cervical priming prior to D&E, misoprostol may be administered po, buccally, sublingually or vaginally [26].

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