

Induced Abortion Guidelines

These guidelines were reviewed by the Clinical Practice–Gynaecology Committee and the Social and Sexual Issues Committee and approved by the Executive and Council of the Society of Obstetricians and Gynaecologists of Canada.

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Abstract

Objective: To provide an updated guideline for the surgical and medical termination of pregnancy.

Options: This guideline discusses and compares the safety and effectiveness of currently available pregnancy termination procedures.

Outcomes: To provide safe and effective methods for the termination of pregnancy.

Evidence: The Medline, EMBASE, and Cochrane databases were searched for relevant articles published between January 1999 and July 2005 related to medical or surgical termination of pregnancy. In addition, specialist gynaecologists and physicians providing termination services were surveyed to determine current practices and opinions.

Values: The results of the survey and evidence collected from the literature search were reviewed by members of the Clinical Practice–Gynaecology Committee and the Social and Sexual Issues Committee. Recommendations were quantified using the Evaluation of Evidence criteria developed by the Canadian Task Force on the Periodic Health Examination (Table).⁸⁶

Summary Statements

1. Women choosing pregnancy termination are entitled to quality care by trained practitioners. (III)
2. Preoperative treatment with metronidazole decreases the risk of postoperative pelvic inflammatory disease in patients with bacterial vaginosis. (I)
3. Medical abortion and suction curettage are safe and effective alternatives up to 56 days' gestation. However, medical abortion is associated with a higher rate of persistent viable gestation. (II-1)
4. Preprocedural cervical dilatation facilitates vacuum aspiration and decreases the incidence of cervical laceration and uterine perforation. (II-2)
5. Prophylactic antibiotics administered perioperatively with surgical abortion reduce the risk of post-abort endometritis. (I)

Key Words: Termination of pregnancy, vacuum aspiration, misoprostol, methotrexate, oxytocin, dilatation and curettage

6. Pain management for suction curettage may involve premedication with non-steroidal anti-inflammatory medications, intravenous sedation, and paracervical block, alone or in combination. (III)
7. Intravenous oxytocin and intracervical vasopressin, alone or in combination, decrease blood loss in surgical abortions in gestations of 15 weeks or more. (I)
8. Both medical termination and dilatation and evacuation (D&E) are safe and effective methods of uterine evacuation in the second trimester. Hysterotomy is associated with increased morbidity. (II-3)
9. Several effective methods of medical termination are available for use in the second trimester. Available evidence does not support the use of one method over another. (III)
10. Mechanical dilatation of the cervix prior to medical termination in the second trimester reduces the risk of cervical laceration and uterine rupture. Cervical ripening with prostaglandin is more likely to result in unsupervised delivery. (II-2)

Summary of Recommendations

1. Manual vacuum aspiration can be performed safely and effectively in an office setting up to 10 weeks' gestation. (B)
2. A cannula size in mm equal to or greater than the gestational age in weeks should be used for manual vacuum aspiration. (B)
3. First and second trimester abortions should be performed by experienced personnel in hospitals or outpatient facilities. (B)
4. If bacterial vaginosis is suspected, the patient should be treated with metronidazole perioperatively. (A)
5. Pre-abortion screening should include Rh status, and cervical cultures for sexually transmitted infections and bacterial vaginosis. Cervical cytology and sickle cell testing should be done when appropriate. (A)
6. Medical abortion with misoprostol and methotrexate should be considered in carefully selected patients who will be compliant with follow-up. (A)
7. A follow-up system must be in place to provide for surgical evacuation of the uterus if medical abortion fails. (A)
8. Ultrasound or measurement of β hCG levels should be used in follow-up in order to determine whether or not the uterus has been evacuated after medical abortion. (B)
9. A paracervical block with 0.5% or 1% lidocaine should be placed before vacuum aspiration. (B)
10. Pre-procedural dilatation of the cervix may be considered. Synthetic or osmotic dilators, laminaria tents, or misoprostol may be used. (B)
11. Perioperative prophylaxis antibiotic coverage should be used routinely in order to reduce the incidence of post-abort infection. (A)

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Criteria for quality of evidence assessment and classification of recommendations

Level of evidence*	Classification of recommendations†
I: Evidence obtained from at least one properly designed randomized controlled trial.	A. There is good evidence to support the recommendation that the condition be specifically considered in a periodic health examination.
II-1: Evidence from well-designed controlled trials without randomization.	B. There is fair evidence to support the recommendation that the condition be specifically considered in a periodic health examination.
II-2: Evidence from well-designed cohort (prospective or retrospective) or case-control studies, preferably from more than one centre or research group.	C. There is poor evidence regarding the inclusion or exclusion of the condition in a periodic health examination.
II-3: Evidence from comparisons between times or places with or without the intervention. Dramatic results from uncontrolled experiments (such as the results of treatment with penicillin in the 1940s) could also be included in this category.	D. There is fair evidence to support the recommendation that the condition not be considered in a periodic health examination.
III: Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.	E. There is good evidence to support the recommendation that the condition be excluded from consideration in a periodic health examination.

*The quality of evidence reported in these guidelines has been adapted from the Evaluation of Evidence criteria described in the Canadian Task Force on the Periodic Health Exam.⁶⁶

†Recommendations included in these guidelines have been adapted from the Classification of Recommendations criteria described in the Canadian Task Force on the Periodic Health Exam.⁶⁶

12. Physicians using intravenous medications and local anaesthesia must be trained in resuscitation and management of complications arising from the use of these medications. (B)
13. Gross examination of the fresh tissue must be made after surgical abortion. (A)
14. Medical induction and D&E are both safe and effective methods of second trimester termination. However, D&E is considered superior between 14 and 18 weeks' gestation. The particular technique should be selected according to the expertise of the physician and wishes of the patient. (B)
15. Oral, rectal, or buccal misoprostol, oxytocin infusion (intraoperatively or postoperatively), and intracervical injection of vasopressin, alone or in combination, should be performed with D&E in gestations longer than 14 weeks. (B)
16. Further research is needed to determine optimal regimens for medical termination in the first and second trimester. (B)

Validation: This guideline has been reviewed by the Clinical Practice—Gynaecology Committee and the Social and Sexual Issues Committee and approved by the Executive Council of the Society of Obstetricians and Gynaecologists of Canada.

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INTRODUCTION

Induced abortion is a controversial topic that ignites complex and emotional debate. Unintended pregnancy is a problem that may never be fully resolved, and women who do not wish to continue a pregnancy will often seek out termination by any means, regardless of safety.¹ This document is not meant to support either side of the abortion debate. Rather, it is intended to assist physicians to present their patients with available options appropriate to their circumstances, to develop a quality management program, based on available evidence, of the current methods for

pregnancy termination, and to provide this service safely and effectively.

All patients choosing abortion are entitled to quality care by practitioners who are qualified to perform procedures and to identify and manage complications.

These clinical guidelines were prepared with the best available evidence and professional consensus on induced abortions.

COUNSELLING

Every woman seeking abortion should receive supportive and compassionate counselling on all the options available, including continuing the pregnancy and having the child adopted or seeking assistance should she wish to parent. Counselling should take place early enough to avoid any delays in the event the woman chooses to terminate the pregnancy. The counsellor should be free of personal bias and responsive to the woman's circumstances.

If the woman chooses to terminate the pregnancy she must have the opportunity to fully understand the nature of the proposed procedure including the type of anaesthesia, safety, potential immediate and long-term complications, and side effects.

The patient needs to know that her care is completely confidential unless she is below the age of consent (see Informed Consent).

Contraceptive counselling, including risk behaviour and risk reduction strategies (including those to prevent sexually transmitted infections), before and after the termination is

imperative to reduce the risk of recurrent unintended pregnancy. The advantages and disadvantages of available contraceptive methods that fit the individual woman's needs, as well as when and how the method of choice will be initiated, should be explained. The physician must assure the patient of the availability of post-abortion counselling.

ABORTION FACILITY

Experience has shown that first trimester and second trimester terminations, up to a gestational age of 16 weeks, can be safely performed by experienced personnel in clinics or physicians' offices.²⁻⁴ (II-2A) In Canada, the proportion of terminations performed in hospitals has declined since the early 1990s, and the proportion of clinic terminations has increased.⁵ A hospital where access to emergency facilities is immediately available is safer for patients with certain health problems (bleeding disorders, major cardiac conditions, etc.) or for those who require a late second trimester termination.

INFORMED CONSENT

It is essential to obtain the patient's written consent for both medical and surgical methods of pregnancy termination. The physician must make sure that the woman understands the nature and the potential complications of the procedure and that she has the necessary information to make an informed decision.

If a minor presents for abortion accompanied by a parent, it is important to ensure the youth was not coerced and the decision is voluntary. In Canadian common law and in some provinces "age of consent" follows the "mature minor" rule: the legal right to make health care decisions depends on decision-making ability rather than age; in other provinces the age of consent is consistent with the age of majority.⁶ The key element is the minor's competence and capacity to understand the consequences of the procedure and the potential for complications, not her chronological age. In provinces that have not adopted the mature minor rule, health care providers can treat minors when appropriate without parental involvement, as common law invariably overrides local legislation. However, there should be documentation that the health care provider discussed the importance of involving parents in health decisions, and there must also be a reasonable impression that the intervention is in the best interests of the minor. It is imperative that health care providers be aware of the laws of the province in which they work.

EVALUATION

Pregnancy diagnosis and accurate estimation of gestational age (GA) are integral aspects of abortion care. Only with

this knowledge can appropriate options be discussed and abortion-related complications minimized. Accurate gestational dating will also assist in the diagnosis and management of abnormal pregnancies.

Preprocedural History and Physical Examination

1. Confirm the diagnosis of pregnancy by urinary or serum β hCG assay.
2. Determine gestational age by:
 - (a) bimanual pelvic examination to ensure the uterine size is consistent with dates; and
 - (b) ultrasound when the GA is questionable or an intra-uterine gestation is uncertain, and in all cases of second trimester procedures.
3. Identify all pre-existing conditions, e.g., malignant hyperthermia, coagulation disorder, cardiorespiratory disease.
4. Determine any factors that could influence the choice of procedure, anaesthesia, or preoperative or postoperative management.

Investigations

Preprocedural tests of hemoglobin and Rh factor are recommended. All unsensitized Rh-negative women require Rh immune globulin following termination. The hemoglobin serves as a baseline for comparison in the event of hemorrhage during or after the procedure.

Investigations should also be performed for rubella immunity (with immunization if susceptible), sexually transmitted infections, cervical cytology (if necessary), and sickle cell disease.

If bacterial vaginosis (BV) is suspected, screening may be prudent. In a randomized study of 231 abortion patients with BV, women treated with metronidazole before the abortion had a significantly lower rate of postoperative pelvic inflammatory disease than those given placebo.⁷(IA)

FIRST TRIMESTER TERMINATION: PROCEDURE SELECTION

Determine the methods of early abortion for which a woman is eligible based on medical and other factors. Then after the options, with pros and cons, have been objectively and thoroughly explained, help the patient select a method. If the woman has had sufficient counselling to make an informed choice, either surgical or medical abortion can be offered.

A. MEDICAL ABORTION (\leq 8WKS)

Research from Canada, United Kingdom, and France indicates that more than one half of eligible women opt for medical methods if given the choice.⁸⁻¹⁰ (II-1A) There is no medication indicated for pregnancy termination in Canada, so this method is managed with the off-label use of methotrexate followed by misoprostol or with misoprostol alone. The reported success of methotrexate in the treatment of ectopic pregnancies led Creinin and Darney, in 1993, to use methotrexate (50 mg/m²) and misoprostol (800 µg) to induce abortion in early intrauterine gestation.¹¹ Numerous trials have demonstrated the safety and efficacy of this method, although it is less efficacious than surgical means. Unconditional follow-up is required to ensure success, and an alternative method must be available in the event of failure. The complete abortion rate is approximately 90% or more in gestations up to 49 days. For gestations of greater duration, the success rate appears to decline.¹²⁻¹⁴ (II-1A) Within 24 hours of the first or second dose of misoprostol, 78 percent of patients pass the products of conception (POC).¹² (IA) The remainder of patients who ultimately have a successful medical termination have a delayed termination that may extend over several days. When medical termination fails, it is mainly due to the incomplete expulsion of POC. Approximately 1% of patients will have an ongoing viable gestation that will require surgical evacuation because of the potentially teratogenic effects of misoprostol.^{8,15,16} (II-2A) There is no clear evidence that non-chemotherapeutic doses of methotrexate cause congenital anomalies.¹⁷

Misoprostol alone can induce abortion in the early first trimester, although repeated doses may be required. In one study, misoprostol 800 µg placed vaginally every 48 hours up to three doses, had a complete abortion rate of 93%.¹⁸

Patient Selection

Candidates for the medical termination of pregnancy need a comprehensive screening to ensure a commitment to follow-up. The patient must be able to participate in the process, tolerate a potential delay in the termination, comprehend the instructions, and be emotionally stable. In addition, the patient must be willing to have a surgical procedure if the medical termination fails. Evidence suggests that the efficacy of medical abortion decreases with increasing gestational age; however, this method may be offered up to 56 days of gestation.^{12,22} (IA)

Contraindications

1. Sensitivity to the medications
2. Known coagulopathy
3. Active liver or renal disease

4. Severe anemia
5. Acute inflammatory bowel disease

Protocol

Investigation as described earlier with the addition of a quantitative βhCG.

(i) Methotrexate and Misoprostol

1. Administer methotrexate 50mg/m² IM (deltoid administration ensures muscular placement) or 50 mg oral (20, 2.5 mg tablets),¹⁴ (IA) and Rh immune globulin if the patient is Rh negative. Prescribe analgesics (not NSAIDs), an antiemetic, and eight misoprostol tablets 200 µg. Ask patient to abstain from intercourse and avoid foods containing folic acid, e.g., green vegetables, legumes, and oranges.
2. On the fifth, sixth, or seventh day after methotrexate, the woman places four misoprostol high in the vagina.¹² If there is no bleeding or passage of tissue after 24 hours, four more tablets should be inserted.
3. On the third day after the first application of misoprostol, a quantitative βhCG serum level should be taken.
4. After seven days, another quantitative βhCG serum level should be taken, followed by an office visit. If the βhCG level has fallen by more than 80% over the seven days, the procedure was a success. If the βhCG level has decreased by less than this amount, a weekly quantitative βhCG serum level should be taken until the level approaches zero or the interval decrease is greater than 80%. If the βhCG level plateaus or increases, this indicates an incomplete abortion or ongoing viable gestation, and a vacuum aspiration should be arranged immediately.
5. Once termination is complete, confirm a non-pregnant, non-tender uterus by bimanual examination and initiate contraception.

(ii) Misoprostol Alone

1. Following a quantitative βhCG, misoprostol 800 µg is placed high in vagina by the woman every 24 or 48 hours (days 1–5) until abortion occurs, or a total of three applications is reached (2400 µg).^{19,20,21} (IA)
2. Rh immune globulin is given days one to seven inclusive if the patient is Rh negative.
3. On day six or seven, a quantitative βhCG serum level should be taken, to be followed by an office visit. If the βhCG has fallen by more than 80% over the seven days, the procedure was a success; however, taking an additional quantitative βhCG serum level

after a further seven days is recommended to ensure continued decline. If the β hCG has decreased by less than this amount, a weekly quantitative β hCG serum level should be taken until the level approaches zero or the interval decrease is greater than 80%. If the β hCG plateaus or increases, this indicates an incomplete abortion or ongoing viable gestation, and a vacuum aspiration should be arranged immediately.

4. Once termination is complete, confirm a non-pregnant, non-tender uterus by bimanual examination, and initiate contraception.

Ultrasound may be used instead of a quantitative β hCG serum assay in sites with rapid on-site access to determine whether the uterus is evacuated and the termination complete.¹² (II-2A) In the many areas in Canada that have a long waiting list for ultrasound, it is preferable to use a quantitative β hCG serum assay to determine the outcome of medical termination of pregnancy.

Advantages Compared With Surgical Termination

1. Non-invasive
2. Patient autonomy: the patient feels more in control, and the process is less frightening²³
3. Private
4. Inexpensive
5. Technically simple
6. Office procedure
7. Immediate application possible
8. Alternative for failed surgical abortion, particularly if the problem involved difficulty accessing the uterus because of uterine leiomyoma or a congenital anomaly²⁴ (II-3A)

Disadvantages Compared With Surgical Termination

1. Commitment to follow-up by patient and physician
2. Longer interval from start to finish
3. Gastrointestinal (GI) upset associated with the medications
4. Up to 10% may have a delayed evacuation of POC for several days to weeks
5. Heavy bleeding and cramps can occur when POC are passed, and the woman should be aware that she would experience this at home
6. Failed termination, defined as the need for a surgical evacuation, can occur in up to 5% of patients

Success of medical termination of pregnancy can be increased if the patient is well informed and given realistic expectations of the process. The well-informed woman will

have a higher threshold for surgical intervention in the event of a delayed reaction.²⁵

B. MANUAL VACUUM ASPIRATION (≤ 10 WKS)

Evacuation of early gestations, within one week of a missed period, with a small-bore vacuum cannula can be performed in an office setting by a properly trained physician. The instruments required are a speculum, a tenaculum, a Karman cannula, and a modified 50 mL syringe (IPAS or Milex). Some women, especially multiparous women, do not require dilatation. All women should have a paracervical block with 10 to 20 mL of 1% lidocaine.²⁶ (II-3A) After the procedure the tissue should be examined, by floating it in a clear plastic dish over a light source, to confirm the presence of chorionic villi or gestational sac. In experienced hands and with the use of a cannula of a size in mm equal to the gestational age in weeks, the failure rate (need for reaspiration) is 0.25%.²⁷ (II-1A) If a cannula smaller than the gestational age is used, the failure rate increases to 1.5%.²⁸ As complication and failure rates are similar for manual vacuum aspiration and early vacuum aspiration up to 10 weeks' gestation, there is no need to delay the procedure for those women who present early.²⁹ (II-1A)

Advantages

1. Office procedure
2. Can be performed without delay, with early relief from undesirable symptoms of pregnancy
3. Only local anaesthetic needed in most cases
4. Private
5. Early detection of ectopic pregnancy²⁹
6. Cost effective
7. Safe²⁸

Exceptions

1. Definite known allergic response to local anaesthetic
2. Contraindication to local anaesthetic or drugs used for premedication
3. Non-compliant or difficult patient
4. Very young nulliparous women who are difficult to examine
5. Any patient who is psychologically or physically unable to cope with the procedure under local anaesthesia will require conscious sedation, e.g., fentanyl (50–100 μ g) with midazolam (1–3mg).

C. VACUUM ASPIRATION (≤ 13 WKS)

Vacuum aspiration can be performed easily and safely with little discomfort in the first trimester under local anaesthetic and premedication with narcotics or sedation if necessary.

Advantages

1. Decreased risk from complications of general anaesthesia³⁰
2. Decreased incidence of blood loss, perforation, cervical laceration³¹
3. Quicker recovery from anaesthesia with less disorientation
4. Faster turnover in the recovery room
5. Quicker discharge and resumption of normal activity³⁰
6. Patient acceptance
7. Greater economy

Exceptions

The same as for manual vacuum aspiration.

Preprocedural Cervical Dilatation

The advantage of preprocedural cervical dilatation is the gradual, safe dilatation of the cervix compared with the forcible and instrumental dilatation during the procedure. Thus preprocedural cervical dilatation facilitates vacuum aspiration and significantly decreases the incidence of cervical lacerations and uterine perforation by up to 80%.^{32,33} (II-2A)

a) Chemical Dilators

The administration of 400 µg of misoprostol, orally or vaginally, 4 to 12 hours prior to first trimester surgical abortion will effectively provide cervical dilatation and softening similar to osmotic dilators.³⁴⁻³⁶

Advantages

1. Convenience: the patient can insert the tablets at home
2. Minimal pain on application
3. Highly cost effective

Potential Disadvantages

1. Cramping
2. Bleeding
3. Incomplete abortion before the surgical procedure

If these occur, the patient must be encouraged to continue with the surgical procedure.

b) Osmotic Dilators

There are two types of osmotic dilators available in Canada: laminaria osmotic dilators and a synthetic polyacrylonitrile osmotic dilator (Dilapan). A potential disadvantage to

osmotic dilators is that if they are wrongly placed, a false passage may be dilated and make access to the endocervical canal difficult. Osmotic dilators can be challenging to place in women who have difficulty with vaginal examinations or who are primigravid. There is also pain associated with the placement of the tenaculum and the insertion into the cervical canal. Laminaria osmotic dilators require six to eight hours to achieve dilatation; the polyacrylonitrile osmotic dilators take only four hours and also soften the cervix.^{37,38} After insertion of laminaria tents there is the possibility of cramps, bleeding, and in less than 5% of patients, abortion.³⁷

Insertion of Osmotic Dilators

1. Visualize the cervix using a speculum and wash with antiseptic solution.
2. Grasp the anterior lip of the cervix with a single-toothed tenaculum or other appropriate instrument.
3. Straighten the cervical canal by gentle traction on the tenaculum, followed by the use of a uterine sound to probe the canal to determine the position, length, and diameter of the internal os. This will aid in determining the size and number of osmotic dilators to be used.
4. Determine the size and number of laminaria osmotic dilators needed.
5. Grasp the osmotic dilator longitudinally at its distal end by uterine forceps and insert it into the cervical canal just through the internal os while applying counter traction to the cervix. The osmotic dilator should traverse both the internal and external os.
6. The osmotic dilator should be held in place for several seconds to reduce expulsion.
7. Place gauze (4 x 4) sponges against the cervix and leave in place until removal of the osmotic dilator.

Preoperative Medications

The American Heart Association, in its most recent recommendations, states that prophylaxis for bacterial endocarditis is not required for abortion or dilatation and curettage "in the absence of infection."³⁹

A meta-analysis of a large number of studies demonstrates that routine antibiotic prophylaxis is safe and effective in preventing post-abortion infection.⁴⁰ (I-1A) Almost all studies have found that prophylactic antibiotics have a beneficial effect, are inexpensive, and rarely cause serious allergic reactions.^{41,42} Prophylactic regimens include (1) doxycycline 200 mg orally 30 to 60 minutes preoperatively or postoperatively and (2) metronidazole 1 g orally preoperatively

followed by 500 mg every six hours for three doses. Risk factors for post-abortion infection include a history of pelvic inflammatory disease or previous post-abortion endometritis, chlamydial or gonococcal infection in the past year, intrauterine device removed at or prior to the abortion, and immunocompromise (HIV, lupus, steroids, insulin-dependent diabetes).⁴¹

Pain Management

Several analgesic/conscious sedation regimens exist using various doses and routes of administration. The choice of anaesthetic depends on the wishes of the patient, the provider's preferences, and the risk assessment.⁴³ It must be kept in mind that 34% of women having first trimester vacuum aspiration under paracervical block report "severe" or "very severe" pain.⁴⁴ Preprocedural non-steroidal anti-inflammatory medication can help to reduce the pain.⁴⁵ Although often used, conscious sedation with midazolam and fentanyl is only slightly more effective than paracervical block for pain relief.⁴⁶⁻⁴⁸ Therefore, current practices for pain relief with first trimester abortion are not optimal. If an anaesthetist is not present during the procedure, the attending physician must be prepared to initiate management should complications arise. All physicians using intravenous medications and local anaesthesia must be trained in resuscitation and stabilization techniques and equipment.

Patients receiving analgesics or sedation should have their blood pressure monitored and be attached to a pulse oxymeter to measure blood oxygen saturation.

Operative Procedures

As with all operative procedures, sound principles of surgical technique and the prevention of complications should include

- accurate preoperative diagnosis and evaluation;
- high level of operator skill;
- sound sterile technique;
- atraumatic surgical technique;
- thorough removal and identification of tissue; and
- careful postoperative supervision and follow-up.

An intravenous infusion should be started prior to the procedure. Prophylactic intraoperative oxytocin administration has not been shown to reduce blood loss in gestations less than 15 weeks.⁴⁹ The awake patient should be informed prior to every action so that she has realistic expectations, especially with painful events (injections, grasping of the cervix, dilatation, and vacuum aspiration).

Procedures

1. Induction of conscious sedation or general anaesthetic.

2. The patient is prepared and draped in the lithotomy position. The gauze and osmotic dilator are removed.
3. A bimanual examination is performed to assess uterine position and size.
4. A speculum is inserted and the cervix visualized.
5. When conscious sedation is used, the anterior lip of the cervix is injected with 2 mL of local anaesthetic solution.
6. The anterior lip of the cervix is grasped with atraumatic forceps or a tenaculum.
7. A paracervical block is performed using 10 mL of 1% lidocaine injected deep into the lower uterine segment where each uterosacral ligament attaches (between 4 and 5 o'clock on one side, and 7 and 8 on the other side), followed by deep injection around the cervix at 2, 3, 9, and 10 o'clock up to a total of 20 mL (up to 4.5 mg/kg) of anaesthetic solution for the entire procedure.⁵⁰
8. There should be a delay of three to four minutes prior to dilatation.
9. To decrease pain, the cervix should be slowly and gently dilated with tapered dilators, e.g., Pratt's dilators.⁵¹ It is suggested the cervix be dilated to a number 27 Pratt dilator up to 8 weeks' gestation, number 31 to 33 up to 10 weeks' gestation, and 37 to 39 up to 12 weeks' gestation. These recommendations are dependent on the size and firmness of the cervix as well as the prior use of misoprostol or osmotic dilators. A survey of providers found that 50% dilate the cervix to a diameter in millimetres corresponding to the GA, and an additional 36% dilate one to two millimetres above the GA.⁴³ (II-3A)
10. During dilatation, the awake patient is informed that she will experience menstrual type cramps. Working slowly will decrease the patient's discomfort.
11. Vacuum aspiration is then performed. Repeated trauma and suction within the internal os should be avoided. The greatest discomfort occurs when the suction curette is pulled through the internal os.
12. Once the uterus is deemed empty, the uterine cavity can be gently explored with a sharp curette.

Intracervical dilute vasopressin (5 units in 20 cc of local anaesthetic) injected into the paracervical area significantly reduces blood loss, and intravenous oxytocin has greatest benefit in reducing blood loss in gestations of 15 weeks or more.^{49,52} (II-2A)

Examination of the Tissue

Gross examination of all tissue should be made during or at the end of the procedure. If there are no recognizable fetal parts or placenta, the tissue should be floated in a clear dish over a light source.⁵³ If chorionic villi cannot be identified, the possibility of an ectopic pregnancy or an incomplete or failed abortion must be considered. The tissue should then be examined in the pathology laboratory.

When the tissue is deemed satisfactory by the physician, it should be disposed of as per institutional guidelines.

Postoperative Care

A physician should be available to treat the patient if significant complications arise. Prior to discharge, postoperative care should ensure that the patient is at minimal risk for serious complications. Periodically, the patient's pulse rate, blood pressure, external bleeding, and general physical condition should be assessed. If systemic drugs have been administered, for analgesia or sedation, the patient may be discharged after a reasonable time of observation, but should be accompanied and not allowed to drive a vehicle. The patient should receive written instructions describing realistic expectations about pain and bleeding, as well as advice about when to seek medical advice and where to access emergency care. Arrangements should be made two to four weeks after the procedure for an examination and for ongoing contraception and prevention of sexually transmitted infections.

Complications

Cervical Shock. This is a vasovagal reaction that usually occurs when the paracervical block is being performed but may also occur after this. A tonic-clonic reaction may be confused with a seizure but is distinguished by the presence of bradycardia, rapid patient recovery, and the absence of a postictal state. The reaction is usually limited to a few minutes. Preoperative cervical dilatation with osmotic dilators or misoprostol, or the routine use of atropine with cervical anaesthesia, can prevent cervical shock.²⁹

Perforation. The clinical presentation of perforation depends on the location of the injury. Perforation at the isthmic portion of the uterus can lacerate the ascending branch of the uterine artery in the broad ligament, leading to a hematoma or intra-abdominal bleeding and severe pain.⁵⁴ Immediate management is laparotomy and ligation of the severed vessel(s) as well as repair of the uterine injury.⁵⁵ Rarely, hysterectomy may be required to manage the bleeding.

Low cervical perforation may injure the descending branch of the uterine artery in the cardinal ligament. This injury is usually the result of forceful dilatation of the cervix. Preoperative cervical dilatation reduces this complication.³² (II-2A) The bleeding is usually external in this situation

rather than intra-abdominal. The bleeding can temporarily subside as the arteries go into spasm. Deaths due to bleeding have occurred several hours or even days after an unrecognized low cervical perforation. Arteriography and selective embolization of the hypogastric arteries should be considered prior to hysterectomy.⁵⁶

If a fundal perforation occurs at the end of the procedure, expectant management is usually all that is necessary.

If perforation occurs before or during evacuation of the uterus, the procedure should be completed under direct laparoscopic observation or using ultrasonic guidance.⁵⁷ It is important to turn the suction off once perforation is recognized to reduce the risk of pulling bowel or omentum into the uterine cavity. If the bowel or omentum is brought into the uterine cavity or through the cervix, laparoscopy or laparotomy will be necessary to complete the procedure and examine the intra-abdominal contents for injury. The omentum or bowel should be left within the uterine fenestration to facilitate the identification and repair of lesions in these structures as well as the uterus.

Hemorrhage. Excess bleeding may indicate uterine atony, a low-lying implantation, a more advanced gestational age, or perforation. Misoprostol (1000 µg rectally or buccally) or intravenous oxytocin, alone or in combination, should be administered, and the abortion completed.⁵⁷ The uterus is then massaged bimanually to ensure contraction. If this is unsuccessful, the administration of intramuscular/intramyometrial 15-methylated prostaglandin F2α may be effective.⁵⁶ Persistent post-abortion bleeding suggests retained tissue, hematometra, or perforation. Prompt surgical intervention by repeat curettage and possibly laparoscopy should be performed. Uterine artery embolization and, rarely, hysterectomy may be necessary.⁵⁷

Hematometra (Post-Abortal Syndrome). Increasing lower abdominal pain within a half-hour of the procedure suggests the formation of a hematometra (accumulation of blood and clots in the uterine cavity). The uterus is large, globular, and tense with associated hypotension or vasovagal response. This condition could be mistaken for a broad ligament hematoma, but the mass is midline and arises from the cervix. The uterus needs to be re-evacuated immediately.⁵⁷

SECOND TRIMESTER TERMINATION (> 13 WEEKS' GESTATION)

There has been considerable controversy over which method of second trimester abortion is safest, least stressful to patient and provider, and most cost effective. However, evidence demonstrates that dilatation and evacuation (D&E) performed by a physician experienced in gestations

up to 16 weeks is safer than instillation abortion, and that both are safer than hysterotomy and hysterectomy.^{58,59}

Surgical Abortion: Dilatation and Evacuation

For gestations of less than 18 weeks, several osmotic dilators should be placed on the day before the procedure. Beyond 18 weeks, serial sets of dilators (10 to 13) should be inserted over two days.⁶⁰ A uterosacral block or paracervical block can be used at the time of insertion to decrease pain and facilitate the insertion of more dilators. Misoprostol is an attractive agent because it is inexpensive, stable at room temperature, and easily applied either orally or vaginally. At 14 to 16 weeks' gestation, buccal misoprostol (600 µg) two to four hours prior to D&E can provide dilatation and softening for vacuum aspiration with a 14 mm curette or further dilatation.⁶¹ If misoprostol is administered vaginally more than four hours before the procedure, there is potential for unexpected delivery (greater than with osmotic dilators).

Procedure

D&E can be performed safely under local anaesthesia (paracervical block) with intravenous conscious sedation and analgesia; however, a full range of anaesthetic options should be available. An outpatient setting may be preferable as this adds more individualized care, greater confidentiality, and fewer bureaucratic issues. The most important requirements for safe D&E are the speciality training, skill, and experience of the surgeon.⁵⁹ If multiple or serial osmotic dilators are used it is usually unnecessary to dilate the cervix further. Up to 17 weeks' gestation, the uterus can generally be evacuated with a number 16 curette or extraction forceps. After 17 weeks' gestation, the amniotic fluid should be carefully and slowly emptied with a suction curette following which the POC should be removed with extraction forceps.⁵⁹

Various forceps have been designed to extract POC at late gestations. The type of forceps depends on the length of the gestation and the degree of cervical dilatation obtained. It is suggested that during forceps extraction the physician keep one hand on the fundus as a splint to reduce the risk of perforation. The procedure may also be performed under ultrasound guidance in an attempt to minimize the incidence of perforation.

The fetal tissue should not be removed forcibly through the cervix, as bone spicules may lacerate the cervix. Crushing and rotating techniques lessen cervical trauma.⁵⁴

After forceps extraction, the uterine cavity should be gently explored with a large curette to ensure complete evacuation. The products of conception need to be examined for completeness.

Intravenous oxytocin (≥ 40 units/L) during the procedure or after uterine evacuation, as well as intracervical injection of vasopressin prior to the procedure (2–4 units mixed with local anaesthetic or diluted with 10–12 ml of saline), can reduce bleeding.⁵⁹ (II-2A)

If bleeding seems to be heavier than expected, bolus oxytocin (intravenously) or intra-cervical vasopressin should be given alone or in combination.

Abortion by Labour Induction

Preinsertion of multiple osmotic dilators 6 to 24 hours prior to amnio-infusion may reduce the time from induction to completion, reduce the risk of cervical laceration, and almost eliminate posterior wall rupture.⁶² (II-2A) Prostaglandins (PGF_{2α}, PGE₁, PGE₂) can be used for cervical ripening but may cause unsupervised delivery. Another form of cervical preparation is the insertion of an Atad double balloon catheter; this method may also be used as a mechanical method of labour induction with similar end points (induction interval and complete abortion rates) to techniques with prostaglandins.⁶³ (I-A)

Techniques for Amniocentesis

The optimal site for amniocentesis is approximately 2.5 cm below the most prominent part of the uterus as palpated through the abdominal wall. The amniocentesis can be performed with a number 16 teflon extracath. Once the amniotic cavity is entered and the amniotic fluid is identified, the rigid central needle should be removed and drainage of amniotic fluid should continue. A pH test on the fluid will confirm its amniotic origin. The induction agent is then injected into the amniotic cavity.⁵⁹ Ultrasound guidance may be necessary under some circumstances (e.g., if the patient is obese).

(a) Prostaglandin F_{2α} (PGF_{2α}) Amnio-Infusion

Intra-amniotic installation of PGF_{2α} is an effective technique but may be associated with the need for a second injection, transient fetal survival, failure, and significant GI side effects.⁶⁴ Pretreatment with laminaria tents can decrease the need for repeat injection, and pretreatment with prochlorperazine 10 mg IM or IV, or another antiemetic with loperamide (4 mg) orally one hour prior to amnio-infusion, will reduce the GI side effects.⁶² (II-3)

A test dose of 5 mg of PGF_{2α} is given over one minute to detect sensitivity to the drug or accidental intravascular placement of the needle. Then a total of 40 to 50 mg is given over a few minutes.⁶⁵ Constant confirmation of the catheter's position in the amniotic cavity must be assured. An additional 20 to 40 mg may be required if the membranes are intact or if there is poor cervical effacement or inadequate uterine activity.

The absence or a decrease in the amniotic fluid volume as a result of ruptured membranes or genetic abnormalities may require an alternative route of prostaglandin administration (see (d) IM Carboprost).

(b) Hyperosmolar Urea Amnio-Infusion

Intra-amniotic hyperosmolar urea (80–90 gms/100 mL 5% dextrose in water for a 59.7% concentration) is effective for labour induction, but injection to abortion times are prolonged.⁶⁶ Augmentation with PGF_{2α} (5, 10, or 20 mg) administered with or immediately after the urea infusion decreases the interval from induction to abortion.³¹

Following successful amniocentesis and the removal of 200 mL of amniotic fluid, the solution is slowly infused by gravity feeding.

Advantages of hyperosmolar urea and PGF_{2α}^{31,66,67}

1. Low failure rates
2. Need for additional doses of PGF_{2α} is almost eliminated
3. Expulsion of live fetuses is significantly reduced

Post Amnio-Infusion Care

Intravenous oxytocin should not be used before the delivery of the fetus unless the membranes are ruptured and there is no uterine activity. If there is no uterine activity, prostaglandin suppositories or intramuscular 15-methyl-prostaglandin are useful.

After the fetus is passed, the patient should be examined to determine if the placenta is in the uterus, the cervix, or the vagina. In the latter two circumstances the placenta should be removed. If the placenta remains within the uterus, the infusion of intravenous oxytocin, 80 to 100 U/L of lactated Ringer's solution is appropriate. Observation to allow for spontaneous evacuation of the uterus can extend to eight hours if the patient is afebrile and bleeding is minimal. The patient should be examined periodically to check for the placenta within the vagina. If the placenta is retained beyond this period, the uterus needs to be evacuated using ring forceps. It is rarely necessary to go to the operating room.

After all POC have been evacuated, the cervix should be examined for trauma.

(c) Extra-Amniotic Prostaglandin

Extra-amniotic PGF_{2α} and PGE₂ is safe and effective in the termination of second trimester pregnancies.^{68,69} (II-2) This method is useful in cases of late second trimester abortion or when access into the amniotic cavity is difficult. A small 12-gauge Foley catheter is passed through the cervical canal and the bulb inflated with 15 mL of saline solution. The bulb is within the uterus but extra-amniotic. The small size of the bulb limits trauma to the extra-amniotic space and

reduces the risk of intravascular infusion and hypertonic contractions. PGF_{2α}, 0.5 to 1.0 mg diluted in saline is given intermittently and titrated to the severity of contractions. There must be an interval between the cessation of prostaglandin infusion and the administration of oxytocin to decrease the risk of hypertonic contractions and the potential for uterine rupture.

(d) IM Carboprost (15-Methylprostaglandin F_{2α}, Prostin/15M, Hemabate)

Carboprost is a synthetic 15-methyl form of PGF_{2α} that is resistant to enzymatic degradation. As a result, carboprost is more potent, and has increased smooth muscle stimulation and longer duration of activity than PGF_{2α} and PGE₂. Thus it can be administered intramuscularly.

In patients not responding to conventional therapy, IM carboprost is successful in approximately 95% within 10 to 20 hours.⁷⁰ The recommended dose for failed late second trimester termination is 250 µg by deep intramuscular injection, with the dose repeated every two hours as needed. The total dose can range from 1250 to 2500 µg.^{70–72} The use of multiple osmotic dilators should decrease the injection to abortion time.⁶²

Oxytocin should not be used concurrently with carboprost and should not be started until at least four hours after the final dose, unless the fetus has been passed.

Indications

1. Failed second trimester abortion with conventional therapy (intra-amniotic PGF_{2α}, oxytocin).⁷⁰
2. Termination of pregnancy in late second trimester and third trimester in cases with minimal or no amniotic fluid.^{71,72}
3. Refractory postpartum or post-abortion bleeding.⁷³

Advantages of Carboprost Versus Other Prostaglandins and Oxytocin

1. Higher potency allows more individualized dosing compared with intra-amniotic methods.
2. IM administration is less painful, easier, and less invasive, which reduces the risk of infection.
3. Carboprost can be used with ruptured membranes or in other situations with reduced amniotic fluid volume.^{71,72} (II-3A)
4. Carboprost allows the patient to be ambulatory for a longer period of time.
5. The non-term uterus responds to carboprost; therefore, induction of labour with intra-uterine demise can occur prior to spontaneous labour.⁷¹

Disadvantages. These include significant vomiting and diarrhea.

(e) Concentrated Oxytocin Infusion

Oxytocin has not been commonly used for abortion induction because it was thought not to be efficacious in gestations less than 24 weeks. However, administered with increasing concentration, oxytocin has been efficacious in achieving second trimester termination.⁷⁴ Oxytocin 50 units in 500 mL 5% dextrose and normal saline is given over three hours, followed by one hour of rest. This is repeated, adding 50 additional units to the next 500 mL of infusion, and the pattern of infusion over three hours followed by one hour of rest is continued until the patient aborts or the maximum concentration of 300 units/500 mL is reached. The mean induction to delivery interval is 8.2 plus or minus 5.1 hours.

(f) Misoprostol

Misoprostol can be used either orally or vaginally for uterine evacuation for fetal demise or second trimester termination; however, oral administration is associated with more GI side effects, such as nausea and diarrhea.⁷⁵ In a study comparing misoprostol 200, 400, and 600 µg given vaginally every 12 hours, the abortion rates were 70.6%, 82%, and 96%, respectively.⁷⁶ (IA) Currently, vaginal misoprostol 200 µg every 12 hours up to 48 hours appears to be the optimal regimen because as the doses increase or the interval of administration decreases, the number and severity of side effects increase.^{77,78} The incidence of abortion within 48 hours of this regimen ranges from 70.6% to 87.2%.^{76–78} Further research is required to determine the optimal dose and frequency for second trimester termination.

Insertion of laminaria tents at the time of the first misoprostol dose did not alter efficacy.⁷⁹ The use of laminaria tents prior to misoprostol, which may improve efficacy, has not been reported. The success interval from initiation to abortion and the failure rate are both increased in viable gestation compared with fetal demise.⁷⁸

Uterine rupture in women with previous Caesarean section has been reported; however, these occurred in gestations greater than 20 weeks and with higher doses or decreased frequency of infusion (200–400 µg every 4–6 hours).⁷⁹

D&E Versus Induction

There are no prospective randomized studies comparing current methods for labour induction and D&E. Older studies that compare these methods and a more recent study indicate that D&E is associated with fewer complications than induction.^{80–82} The most frequent complication associated with induction was retained placenta. Of the induction methods, misoprostol was the most efficacious but still had more complications than D&E.⁸² One

consideration in Canada is the lack of physicians who have the experience to perform advanced gestation D&E.

Hysterotomy and Hysterectomy

Hysterotomy is essentially an early classical Caesarean section. With current pharmacologic agents for labour induction in pregnancy termination, the procedure is rarely indicated as a primary method of abortion. The morbidity and mortality associated with hysterotomy are far greater than for any other technique.⁵⁸ In most cases, failed abortions are managed with parenteral, oral, vaginal, or rectal prostaglandins even in the presence of a uterine anomaly. Only after failure of the prostaglandins should hysterotomy be performed.

If pregnancy co-exists with a separate indication for hysterectomy (cervical, uterine, or ovarian cancer) then gravid hysterectomy may be indicated. However, a simpler means of pregnancy evacuation followed by a definitive diagnosis and therapy is preferred and will reduce the associated morbidity and mortality associated with gravid hysterectomy.⁶⁵

REDUCING ABORTION COMPLICATIONS

Hemorrhage from Surgical Abortions

During operative pregnancy termination (vacuum aspiration or D&E) general anaesthetics (especially halothane or similar agents) appear to increase blood loss compared with local anaesthetics using intravenous narcotics and sedation.^{30,83}

Vasopressin, not epinephrine, can significantly reduce blood loss and reduce the risk of hemorrhage when injected into the paracervical area, especially in later gestations (≥ 15 weeks' gestation).^{49,52} The difference in blood loss appears to be related to gestational age, and is significant in gestations of 15 weeks or greater.

Perforation

Complete or partial perforation of the uterus is not uncommon. Risk factors beyond the control of the physician include gestational age, with a relative risk (RR) of 1.4 for each additional two weeks of gestation, and parity, with baseline RR 3.4 for the multiparous woman versus 1.0 for the nulliparous woman.³⁸

Factors that are within control of the physician are preprocedural cervical dilatation, type of anaesthetic, and experience.^{38,59} Use of osmotic dilators is associated with a RR of 0.2 of perforation, which is a significant decrease. General anaesthetic use increases the RR of perforation to 1.3. The most important factors for the risk of perforation are training and experience as demonstrated by the increased RR of perforation up to 5.5 in procedures performed by residents compared with experienced physicians.

Failed Attempted Abortion

This complication occurs in approximately 2 per 1000 abortions performed at less than 12 weeks' gestation.⁸⁴ Several factors increase this complication.

1. Previous pregnancy: RR 2.2 for gravida greater than one
2. Gestational age: RR 2.9 for gestations less than six weeks
3. Small cannula size: RR 11.1 if mm diameter is less than weeks of gestation for pregnancies less than six weeks
4. Uterine anomaly: RR 90.6
5. Physician training: RR 2.2 for residents

It is therefore necessary to inspect the tissue after every case to identify the products of conception and ensure that the abortion was successful.

POST-ABORTAL CONTRACEPTION

Refer to SOGC's Canadian Contraception Consensus.⁸⁵

CONCLUSION

All therapeutic abortion techniques require proper training. Operators must be skilled, not only for the initiation of abortion, but also in the management of incomplete and failed procedures, uterine perforation, and such complications as hemorrhage, infection, and cervical laceration. Adequate training and ongoing experience using modern techniques with new methods will lead to a significant decrease in complication rates.

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