

Multiple laminaria treatment in early midtrimester outpatient suction abortion: a preliminary report*

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Abstract

Evidence is accumulating from various sources that midtrimester abortion may be more safely performed by dilatation and evacuation than by amnioinfusion techniques. Using a technique developed in Japan, 150 patients whose pregnancies ranged from 13 to 19 weeks from the last menstrual period were aborted by dilatation and evacuation. In 110 patients, a multiple laminaria technique was used for dilatation. This technique proved to be highly satisfactory for the more advanced pregnancies, producing a median blood loss of 80 cc and procedure times that averaged eight minutes. There was a 2% retained tissue rate, a 2% infection rate, and one minor cervical laceration among all 150 patients. Of the patients, 95% had follow-up contact, and none experienced a major operative or postoperative complication. We have concluded that multiple laminaria technique for cervical dilatation produces consistently superior results in outpatient termination of early midtrimester pregnancies.

Desde varias fuentes se están acumulando evidencias que parecen indicar que los abortos del segundo trimestre se efectúan con más seguridad mediante dilatación y evacuación que por técnicas de amnioinfusión. Ciento cincuenta pacientes con embarazos entre las 13 y las 19 semanas desde la fecha de la última menstruación fueron abortadas mediante dilatación y evacuación utilizando técnicas desarrolladas en el Japón. En 110 pacientes se utilizó una técnica de múltiples laminarias para la dilatación. Esta técnica resultó muy satisfactoria para los embarazos más adelantados, produciendo una pérdida de sangre media de 80 cc y un tiempo de evacuación que duró un promedio de 8 minutos. Entre las 150 pacientes se comprobó una incidencia del 2% de retención de tejidos, 2% de infección y un caso menor de laceración cervical. En el 95% de los casos, las pacientes fueron seguidas post-aborto y en ningún caso se comprobó complicación mayor, ya sea operatoria o postoperatoria. Concluimos que la técnica de las laminarias múltiples para la dilatación cervical produce resultados constantemente superiores en la terminación ambulatoria de los embarazos a principio del segundo trimestre.

In an intriguing final chapter in Neubart and Schulman's *Techniques of Abortion*, Selig Neubart described the Japanese experience

with laminaria (1). In particular, he discussed the Japanese technique of multiple laminaria treatments over several days to induce

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labor in midtrimester pregnancies. The material was anecdotal but provocative. The management of early midtrimester abortion has been a subject of great controversy. The conventional approach for early abortion is to do manual or laminaria dilatation, followed by vacuum aspiration and curettage up to 12 weeks from the last menstrual period (2). If the patient presents after this time, she is usually required to wait until 16 weeks from her last menstrual period for an amnio-infusion technique utilizing saline, urea, or prostaglandin. The complications experienced by these techniques are impressive, ranging from retained placenta and hemorrhage to disseminated intravascular coagulation syndrome (3). Another serious problem has been the reaction of nursing staff to the procedure and its aftermath (4). Yet another is the relative unpredictability of the time of delivery, which may occur up to 7 days after the injection (5).

One of the surprising findings of the early Joint Program for the Study of Abortion study was the increased safety of vacuum curettage at any stage of pregnancy over 13 weeks (6,7). This has been confirmed by the continuing study of the Center for Disease Control (8).

The advantages offered by combining the 2 techniques of vacuum aspiration with the multiple laminaria method of dilatation were suggested when 1 patient was misdiagnosed on the initial visit and laminaria placement. The following day, as she was prepared for her abortion, it was evident that gestation was several weeks longer than the previously estimated 11. Overnight dilatation accomplished by 1 laminaria permitted placement of 4 new laminaria. The patient was asked to return that afternoon, and the termination of a 15-week pregnancy was accomplished without difficulty. A decision was made to offer this procedure to patients requesting abortion in the early midtrimester. Each patient was instructed on its possible risks and the fact that its safety was not clearly established. Patients were also advised of alternatives.

Materials and methods

Initially, patients with pregnancies of 13 to 15 weeks' duration from last menstrual period (11-13 weeks' gestation) were selected to participate. One thick laminaria was placed in the afternoon and replaced the

following morning with several new laminaria. The procedure, using the standard vacuum aspiration technique, was accomplished in the afternoon. An intravenous infusion of Ringer's lactate was in place prior to the beginning of the actual aspiration. Oxytocin was delivered at a rate of 1,325 milliunits/minute via this route, usually starting after the uterus was emptied. It was accompanied by 0.2 mg of intramuscular methylergonovine maleate. A light sharp curettage was performed at the conclusion of the evacuation of the uterus.

It became apparent that this protocol did not produce adequate dilatation for the more advanced cases, and another step was added. Patients received a thick laminaria in the afternoon of day 1, several new laminaria the following morning, and a third replacement with a larger number of new laminaria that same afternoon. This was followed by an operative procedure the morning or early afternoon of the third day. The latter regimen produced the most consistent good results, as indicated by reduced blood loss and procedure time.

The first laminaria interval averaged 17 hours, the second 8 hours, and the third 17 hours. Four to 5 laminaria were placed at the time of the second (morning) treatment, and 6 to 7 were placed at the time of the third (afternoon) treatment. The median total laminaria time for patients having the full treatment was 42 hours, with a maximum of 49 hours. The median laminaria time for all 150 patients was 41 hours. *Laminaria japonicum* were used in all instances.

Patient discomfort during the procedure was minimized by the application of a paracervical block in all cases and by the use of Bierhoff knee crutches instead of heel stirrups.

Instruments which proved to be extremely helpful were oversized Pratt dilators (up to 59 French size) and various serrated and smooth ovum forceps. The dilators supplement an already soft and widely dilated cervix and permit passage of a Bierer forceps with a 19 mm blade. An atraumatic side-curve Kelly cervical tenaculum is used for countertraction.

Vacuum is used sparingly due to the thinness of the uterine wall; it is used primarily to empty the amniotic fluid. Adequate dilatation allows more satisfactory delivery of the uterine contents by various forceps.

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All tissue was weighed and inspected carefully for completeness. Parameters established by Streeter (9) were used to determine fetal age.

All patients were observed for a minimum of 2 hours in an adjacent recovery room. All patients were given methylergonovine maleate orally for 3 days post-abortion and most were placed on 500 mg of tetracycline four times a day for 5 days post-abortion. Follow-up exams were performed routinely at 1 week and 4 weeks. Patients were instructed to call immediately if they experienced any unusual cramping, bleeding, or fever.

All procedures were performed on an outpatient basis in an ambulatory clinic located across the street from a community hospital.

Results

Of the 150 patients having abortions performed in the thirteenth week from the last menstrual period (11 weeks' gestation) or later, 110 experienced a multiple laminaria procedure. Only 5% of all patients resided in the local community, while 76% were from elsewhere in Colorado and 19% were from out-of-state. The median age of all patients was 19; 42% were 18 or younger. Of the total 37.6% had had previous pregnancies, and 14% had had 1 or more previous abortions. Some form of contraception was being used by 15.4% when they became pregnant. Over two-thirds of the patients were referred by either a private physician or referral agency. Many were unaware of the legality or availability of abortion.

Supplemental manual dilatation was performed on 52.3% of the patients, although little or no force was required on patients receiving the full multiple laminaria treatment.

The median blood loss experienced was 75 cc with a mean of 117 cc. The range was from 5 cc to 750 cc. The median procedure time was 8 minutes with a mean of 10 minutes.

Three patients left the clinic with retained tissue, 1 of whose problem was known at the time; the fetal skull could not be removed, and she was advised to come back daily for evaluation. She passed it spontaneously the

day after the abortion and experienced no further complications. Another patient similarly passed retained tissue the day following her procedure and experienced no other complications.*

Eleven patients required reaspiration within 6 hours after the initial attempt, due either to known incomplete procedure or to continued bleeding. Eight of these patients experienced difficulty in delivering the fetal skull. It was found that allowing the patient to wait for several hours resulted in presentation of the part at the internal os and relatively easy extraction upon the second attempt. This problem appears to have been eased by use of adequate laminaria dilatation, oversize dilators, and the Bierer forceps. The rate of retained fetal skull was 8% in the first 64 cases and 3% thereafter, reflecting both improved technique on the part of the operator and improved instrumentation.

One patient was hospitalized overnight for observation because of a suspected uterine perforation. Her hospital course was uneventful and she experienced minimal bleeding. She was discharged the following day and experienced no further complications. None of the patients required a transfusion. Follow-up contact was made with 95% of all patients; 62.5% have had clinic follow-up by the operating physician. All but 2 of the patients who experienced the multiple laminaria treatment have had follow-up contact. Four patients had abnormal pelvic examinations as evidenced by uterine tenderness and fever. All were treated with broad-spectrum antibiotics and experienced no further symptoms. Nine patients (6%) reported transitory fevers of between 100.0° and 100.4° F. following the abortion but before the follow-up examination. Four of these (already described) were diagnosed as having endometritis and were treated. No patients reported fevers in excess of 100.4°, and none of these lasted more than a few hours. Most fevers occurred 1-3 days post-abortion.

One patient who was 13 weeks from her last menstrual period and who did not have the multiple laminaria treatment experienced a small cervical laceration at the tenaculum site during supplemental dilatation. It was sutured primarily with 3-0 chromic and

* A third patient appeared for her second routine (one month) follow-up complaining of heavy bleeding, which occurred that day. Vacuum aspiration and curettage produced 10 g of adherent residual tissue.

healed without incident.

Twenty-three patients with a final gestational estimate of 13 weeks since the last menstrual period had only 1 overnight laminaria treatment. The difference in blood-loss between these patients and the 22 who had multiple laminaria treatment was negligible, and a decision was made to abandon the extended treatment for those patients clearly in this category. Median blood loss and actual procedure times are shown for each week of gestation in Table I.

For overall comparison, all patients having a multiple laminaria treatment (N = 110) were grouped (Table II). Table II also shows median blood-loss and procedure times for patients having a full 3-day laminaria treatment protocol, which has become standard operating procedure. As can be seen, the results are internally consistent. The median blood-loss for all 150 patients was somewhat lower due to the inclusion of earlier cases.

Blood-loss was measured as precisely as possible by separating the fraction of fluid obtained in the suction bottle from the portion in the basin on the operating field. Usually, the portion in the bottle was almost

entirely amniotic fluid, while that in the basin was blood with little amniotic fluid. Occasionally, membranes could be ruptured just prior to initiation of the vacuum curettage which allowed collection and measurement of the amniotic fluid in a separate basin.

Discussion

One concern which we experienced with this series of patients was the possibility of bleeding occurring prior to the scheduled procedure time. It seemed possible that heavy bleeding would require immediate evacuation of the uterus without adequate dilation. In fact, 1 patient experienced bleeding during a laminaria change but the laminaria were reinserted anyway, the gauze packing was replaced, and the patient experienced no further difficulties.

Another concern was that of underestimating the length of gestation. The number of weeks from true last menstrual period was often unreliable in this group, ranging from 3 to 26 with many obviously unrelated to the actual length of gestation. Recently, the

TABLE I
Blood-loss and procedure time by week of gestation

Weeks from last menstrual period	Number	Median blood-loss (cc)	Median procedure time (minutes)
13	45	50	5
14	35	85	8
15	44	100	9
16	16	125	8
17	5	200	12
18	4	150	14.5
19	1	150	12

TABLE II
Blood-loss and procedure time by technique, laminaria time, and all cases

	Number	Median blood-loss (cc)	Median procedure time (minutes)
Multiple laminaria treatment	110	80	7.5
Laminaria time = 42 hours	80	100	8
All patients	150	75	8

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community hospital acquired the capability of determining fetal age by sonography. Only 28% of all cases reported here occurred when sonography could be utilized for determination of fetal age, and no firm conclusions can be presented. However, this appears to be an invaluable study for determining the appropriate procedure. Since the procedure described here frequently allows delivery of the fetal skull in a relatively intact condition, comparisons can be made between the sonographic study report and clinical findings. So far, the largest fetus delivered had a sonographic biparietal diameter of 42 mm. The clinical finding was 44 mm, corresponding with a gestational age of 17 weeks or 19 weeks from the last menstrual period. The procedure took 12 minutes and the patient experienced a blood-loss of 150 cc.

There are several observations possible at this point which may serve as cautions to those attempting this procedure. First, the patient must understand the procedure, why it is being done, and why it is important to present at the appropriate times for laminaria treatments. The presence of a trained abortion counselor who conducts the patient through this experience is, in our opinion, essential.

Second, there must be adequate time reserved for careful placement of the laminaria in sufficient numbers to produce the necessary dilatation. The laminaria must be of high quality and properly sterilized.

Third, the operative procedure should be done with adequate dilatation. In our opinion, the total length of time of laminaria treatment and the number of changes of

laminaria is important in producing both dilatation and uterine irritability. In our experience, shortened treatment times tended to result in long, difficult procedures with relatively heavier blood-loss and greater risk of retained products of conception.

Fourth, the operative procedure must be done with appropriate instruments and with great caution to avoid a uterine perforation.

Fifth, oxytocin should not be applied until the uterus has been evacuated of the fetal skull; methylergonovine maleate should not be applied until the uterus is almost entirely empty. Premature application of these drugs results in contraction which prevents delivery of the uterine contents.

Sixth, patients should be observed for a minimum of 2 hours in a supervised recovery room for signs of excessive bleeding, perforation, or hypovolemia.

Seventh, we recommend the routine use of prophylactic antibiotics due to the number of manipulations involved.

A final note concerns the reactions of medical personnel assisting with this procedure. Operative performance of an abortion at this stage of gestation is sometimes disturbing to those assisting. It is important to recognize that the patient's alternative at this point in pregnancy is not better, and that the emotional trauma of the abortion is transferred to some extent to those who are performing it. We have found that discussion of this aspect is essential to staff morale and understanding of the medical objective. It is our opinion that this procedure offers a lower medical risk and less emotional trauma for the patient than a later amnioinfusion technique.

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