Hysteroscopy and laparoscopy in women with menorrhagia

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Menstrual blood loss was measured in 139 of 182 women who had hysteroscopy after a complaint of menorrhagia, and a preliminary diagnosis of dysfunctional uterine bleeding. Laparoscopy was also performed in 117 of these women; only 51% did not have evidence of organic pelvic disease. In those with menstrual blood loss of less than 60 ml, 75% had no abnormality, compared with only 44% and 36%, respectively, in the moderately heavy and excessively heavy groups. All those with polypoidal or submucous leiomyomas exhibited moderately heavy or excessively heavy bleeding, and so did many of those with superficial intramural or subserous myomas. The highest rate of detection of endometriosis was in women with moderately heavy blood loss, rather than excessive or normal (54% compared with 29% and 23%, respectively), and such women were more likely to have mild stage disease than severe. Other pelvic abnormalities such as adenomyosis, endometrial polyps, pelvic inflammatory disease, and some rarities were also characterized. It is contended that the era of routine, blind diagnostic curettage is now passed, and should be replaced by outpatient or office hysteroscopy accompanied by directed biopsy or curettage. (AM J OBSTET GYNECOL 1992,162:1264-9.)

Key words: Laparoscopy, hysteroscopy, menorrhagia

Menorrhagia is a common gynecologic complaint, but assessment, diagnosis, and management may sometimes be difficult. Many women have difficulty determining whether their "heavy" periods are abnormal[1, 2] or if they have really experienced a change in blood loss from one cycle to the next or even from one day to the next.[3] Nevertheless, groups of women with similar blood loss are broadly correct in their assessments. When menstrual blood loss is measured objectively in research studies, the upper limit of normal appears to lie between 60 and 80 ml per period, based on changes in hematologic parameters.[1]

In those women with objectively verifiable menorrhagia, determination of cause may be difficult, particularly in confirming whether mild to moderate degrees of certain pelvic conditions, such as leiomyomas, adenomyosis, or endometriosis, may be present. Obvious pathologic conditions may be diagnosed with some degree of confidence on the basis of history and clinical examination, but frequently specific means of pelvic imaging (in particular, hysterscopy) may be valuable. Blind curettage is associated with such a large error in diagnosis that it should no longer be used on its own as a routine diagnostic technique.[4, 5] Imaging techniques, such as laparoscopy, ultrasonography, hysterosalpinography, computed tomographic scanning, and, in a few centers, magnetic resonance imaging, may have

some place in aiding diagnosis in certain cases. In a small proportion of cases clinical suspicion may suggest the need for laboratory investigations to define possible medical causes, such as coagulation disorders, lupus erythematosus, or hypothyroidism.[6]

This article reports the use of hysteroscopy and laparoscopy in a personal series of patients who were initially seen with a convincing clinical history of menorrhagia but no definite underlying cause based on history or pelvic exmaination. These women were therefore given a working diagnosis of "dysfunctional uterine bleeding."[6]

Material and methods

A total of 316 women with complaints of menorrhagia were seen over a period of 12 years. They were referred and recruited from a number of sources including general practitioners, other specialists, hospital clinics, through participating in clinical trials, and by word of mouth from other patients. There was a high tertiary referral rate of patients who had already seen a specialist at some stage, and almost all had undergone diagnostic curettage at some time in the recent past. Many women had been advised to have a hysterectomy and wished to avoid this if possible; hence this group has some bias compared with patients who would normally be seen by most gynecologists in routine practice.

A detailed menstrual history and a general medical and social history were taken from all women. General physical and pelvic examinations were done. All women had a complete blood count if this had not recently been performed elsewhere. Other investigations were only done if indicated. These included a multiple serum biochemical analysis, partial coagulation screen, serum

thyroid-stimulating hormone and thyroid function tests, and tests for systemic lupus erythematosus (including antinuclear antibody, lupus inhibitor, and deoxyribonucleic acid binding). Diagnostic hysteroscopy and curettage were done with the patient under general anesthesia in hospital on a day-stay basis. Laparoscopy also was performed in many cases. Laparoscopy was not performed as a routine investigation for menorrhagia but only when other symptoms or signs indicated.

Instrumentation. Hysteroscopy was done with a standard rigid Storz hysteroscope (Karl Storz Instruments, Tuttlingen, West Germany; 7 mm diameter, with two side channels and an operating channel for fine scissors or a biopsy probe) or a Hamou microcolpohysteroscope (Karl Storz; 4 mm diameter, with one side channel but no operating channel, with a magnification capacity up to ×60). With the Storz scope the cervix was dilated to 8 mm and the cavity was distended through a side channel with a handheld 20 ml syringe containing 32% dextran (Hyskon; Pharmacia South Seas). With the Hamou scope cervical dilatation usually was not necessary and dextran was again used for distension. On occasion the Hamou scope was used in contact mode and sometimes with magnification. The cavity was inspected systematically at both moderate and low distention pressures with attention to cavity size and shape, appearance of tubal ostia, endometrial surface appearance, and endocervical appearance. Hysteroscopy was almost always followed by curettage or directed biopsy.

Laparoscopy was performed through a subumbilical incision by means of a Storz 8 mm direct vision tele scope (Karl Storz), with insufflation of carbon dioxide through the single side channel on the sheath, controlled by a standard Storz laparoscopy insufflator with automatic pressure control facility. A double-puncture technique was always used with a probe inserted through a low midline incision; on some occasions a third puncture was made for insertion of additional surgical or manipulative instruments. The peritoneal cavity was inspected systematically with special attention to all accessible surfaces of the pelvic organs, including close-up assessment of suspicious areas of peritoneum for early endometriosis. Biopsy specimens were obtained when indicated. Peritoneal fluid was aspirated when inspection of the pouch of Douglas was obscured. Hydrotubation with methylene blue was performed in cases with coincidental infertility, or if indicated by abnormal tubal appearance. In most cases, a general inspection of the abdominal cavity, including the appendix, paracolic gutters, and liver, was also performed.

Menstrual blood loss measurements were done in at least one cycle in 139 women with a semiautomated modification of the alkaline hematin method of Hallberg and Nilsson[7] as described previously.[2, 8] This method involves careful instruction in the collection of all sanitary pads in thick, opaque polythene bags. The bags were returned to the laboratory within a few days of the end of the menstrual period, and assays were done with 5% sodium hydroxide extraction in a semiautomated extractor. This was converted to milliliters of whole blood after measurement of the hemoglobin concentration of a cubital vein blood sample collected a few days previously.

Clinical material. Of a total of 316 patients who had complaints of menorrhagia, 182 had hysteroscopy; 117 also had laparoscopy. A history of infertility was also present in 67 cases. Ages of the patients ranged from 13 to 52 years (mean ± SD, 34.2 ± 6.6 years). Seventy-one of the women who had hysteroscopy were nulliparous. The findings in some of these women have been reported in part previously.[2, 9-11]

Statistical methods. The data were analyzed with two-way frequency tables of counts. Measured blood loss, subdivided into three levels, was a classification factor in each table. In the various analyses the second factor was a particular classification of abnormality. The fitting of log-linear models[12] method of analysis was used, and the analyses were performed with the GLIM computer package (Generalized Linear Interactive Modelling System, Numerical Algorithms Groups Ltd, Oxford). When two factors were independent the observed counts would be adequately represented by a model containing parameters for just the two main effects with no interaction effect. The simplest possible model was fitted, and the adequacy of the model was assessed in terms of the scaled deviance of observed from fitted counts.

Results

The endoscopic findings in 182 women are summarized in Table I. It was possible to obtain menstrual blood loss measurements in at least one untreated cycle in 139 of the 182 women who had hysterscopy. These cases have been divided into three separate categories according to measured loss: <60 ml (normal); 60 to 120 ml (moderately heavy); and >120 ml (excessively heavy). They have been further categorized according to the numbers of women who had hysteroscopy and laparoscopy, and according to the endoscopic findings in each group.

No abnormality found. A total of 92 women had no abnormal findings (51%). The highest proportion of normal women (75%) was found in the group with measured blood loss of <60 ml. In the moderately heavy and excessively heavy groups, the proportion of normal women was significantly lower (44% and 36%, respectively). When the main effect model (with no interaction term) was fitted to the counts, the scaled deviance was unacceptably high (14.7, 2 df, $p < 0.01$).

Table I. Pelvic findings and menstrual blood loss measurements in 182 women with complaints of menorrhagia provisionally diagnosed as dysfunctional uterine bleeding*

Menstrual blood loss (ml)	No. with hysteroscopy	No. with laparoscopy	No abnormality found	Leiomyomas			Endometriosis		
				SS/IM	SM	P	Mild	Moderate	Severe
<60	47	26	35 (75%)	3	0	0	3	2	1
60-120	59	35	26 (44%)	10	2	0	12	4	3
>120	33	24	12 (36%)	2	5	5	5	1	1
Not measured	43	32	21 (49%)	6	3	1	8	3	2
Total	182	117	94 (51%)	21	10	6	28	10	7

SS/IM, Subserous or superficial intramural; SM, submucous; P, polypoidal; L + E, coincidental leiomyomas and endometriosis.
*All women had hysteroscopy and 117 also had laparoscopy.
†Women with minor polypoidal endometrium have not been counted as having significant pathologic conditions.

Inclusion of a term for the interaction of abnormality with measured loss less than or greater than 60 ml resulted in an acceptable model (effecting a reduction in scaled deviance of 14.2, 1 df, $p < 0.001$). Therefore this significant association of abnormality with increasing menstrual blood loss can be explained almost entirely by the increased proportion of abnormalities above 60 ml blood loss; there was no further significant increase in the group with blood loss ≥120 ml. There may have been some bias in selection of women for laparoscopy, although this was not done on the basis of predicted menstrual blood loss. A slightly higher proportion of women in the excessive loss group (72%) had laparoscopies than in the moderately heavy (59%) and normal (55%) groups. This was not statistically significant but may have made a small contribution to the likelihood of finding an abnormality in the group with the highest blood loss.

Leiomyomas. Thirty-seven women were found to have leiomyomas. The types of myomas have been categorized in Table I, and no patient appears in more than one column (polyps and then submucous myomas took precedence in the classification; no patient in the subserous-intramural column had a submucous myoma or intrauterine myomatous polyp). It is noteworthy that only three of 47 women with normal blood loss had any myomas (all subserous or superficial intramural), compared with 12 of 59 women with moderately heavy loss who had subserous, intramural, or submucous myomas and 12 of 33 with excessive blood loss who had myomas that were mainly submucous or polypoidal. For the main effect model the deviance was unacceptably high (11.69, 2 df, $p < 0.01$). Inclusion of an interaction term of leiomyomas with measured loss < or >60 ml achieved a satisfactory fit (effecting a reduction in scaled deviance of 8.94, 1 df, $p < 0.01$). Clinically this indicates that all types of leiomyomas were likely to be associated with an increase in measured blood loss above 60 ml.

There were also trends in the type of leiomyoma

likely to be associated with different levels of blood loss. Six women had pedunculated intrauterine fibroid polyps arising from, or close to, the uterine fundus. All five of these women who had blood loss measured had losses in the excessive range (two were above 400 ml). An additional 10 women had submucous myomas, and those seven with measured loss were in the moderately heavy or excessive range. Twenty-one women had subserous or superficial intramural myomas alone, and many of these lesions were relatively small (<1 cm). Twelve of 15 of these women also had moderately heavy or excessive blood losses. As expected from the first analysis, there was excessive deviance from the main effect model (29.6; 6 df, $p < 0.001$). In this case the interaction term that achieved a satisfactory model was of leiomyoma classification with measured loss > or <120 ml (reduction in deviance 24.1; 3 df; $p < 0.001$). Thus, although findings of leiomyomas were more common among women with measured loss >60 ml, the finding of submucous or polypoidal myomas was more common in women with measured losses exceeding 120 ml.

Endometriosis. A total of 45 women were found to have endometriosis, of whom 28 had mild disease (American Fertility Society revised classification[13]; stage 1 disease; score < 15). Many of these 28 women had early endometriosis of the type described by Jansen and Russell,[14] usually confirmed by peritoneal biopsy. Six of 26 women (23%) in the normal blood loss group who had laparoscopy had confirmed endometriosis, compared with a significantly higher proportion of 54% in the moderately heavy group and 29% in the excessive group. For the main effect model the lack of fit was not extreme (7.26; 2 df; $p < 0.05$). However, it was almost all attributable to the interaction of endometriosis with measured loss in the 60 to 120 ml range (reduction in scaled deviance 7.02; 1 df; $p < 0.01$). This suggests that endometriosis may sometimes be responsible for an increase in menstrual blood loss into the moderately heavy, but not excessive, range.

L + E	Adenomyosis	Endometrial polyps		Other
		Minor	Major	
1	1	6	1	2
5	2	5	2	3
2	0	8	0	4
6	2	5	2	2
14	5	24	5	11

There were too few patients who had laparoscopy for a satisfactory analysis of the severity of endometriosis according to measured blood loss group. However, examination of Table I gives no indication that increased blood loss is associated with "severe" endometriosis. On the contrary, in the heavier blood loss groups higher proportions of endometriosis cases are classified as "mild" than in the normal blood loss group; conversely, the proportions classified as having "moderate" or "severe" endometriosis are lower in the heavier blood loss groups.

Fourteen women were found to have coincidental endometriosis and leiomyomas (10 subserous and superficial intramural), with no clear differences between the blood loss groups for the eight in whom blood loss was measured. Thus there may be some confounding between the blood loss effects of endometriosis and subserous-intramural leiomyomas, each of which was found to be associated with increased likelihood of losses in the 60 to 120 ml range. As far as can be ascertained, after adjustment for the expected number of leiomyomas, the rate of endometriosis in the moderately heavy blood loss group remains about double that in the other two blood loss groups.

Adenomyosis. Five women had adenomyosis proved by biopsy, with two in the moderately heavy blood loss group and one in the normal group.

Endometrial polyps. Twenty-four of 182 women were seen to have minor endometrial polyps that were not confirmed by the pathologist who examined the curettings. Only four of these patients did not have additional findings described above. Five women had moderate-size endometrial polyps confirmed on pathologic study; two of these had blood loss in the moderately heavy group.

Other pathologic findings. Ten women had evidence of previous infective tubal disease but only four had no additional pathologic findings. Of these four, one case was in each blood loss category (including the "not measured" group). Of those with coincidental disease, two had endometriosis, two had leiomyomas, one had adenomyosis, and one had an endometrial polyp.

Other conditions included anovulation with endo-

metrial cystic glandular hyperplasia (three cases; one moderately heavy and one with excessive loss); five cases of bicornuate or septate uterus (one with moderately heavy and one with normal loss; three patients had myomas or endometriosis); one each of excessive loss with previous cervical artery damage[10] and myometrial hypertrophy.[11]

No cases of endometrial carcinoma were found. Cycle regularity and timing of curettage suggested ovulation in the majority of patients, but persistent proliferative endometrium was found in 29 cases and hyperplasia in three. Persistent proliferative endometrium was recorded in 22 of the women with otherwise normal finding (four normal loss; eight moderately heavy loss; three excessively heavy loss; seven not measured).

Comment

This study confirms a remarkably high incidence of pelvic pathologic conditions in women with a clinical working diagnosis of dysfunctional uterine bleeding. Beazley[15] has previously reported a group of 287 women who underwent hysterectomy for dysfunctional uterine bleeding, and on pathologic examination 40% were found to have a significant organic lesion thought to be sufficient to account for their abnormal bleeding. The patients investigated in this study probably represent a biased group of referrals, but they nevertheless demonstrate that a high number of pelvic pathologic conditions may be present in women who do not have definite findings in initial history, clinical examination, and initial investigations. The group bias is primarily explained by the fact that most of the older patients and those with obvious clinical findings would have undergone hysterectomy elsewhere. A high proportion of women in this study did not want a hysterectomy. It seems improbable that this would have made them more or less likely to have subclinical abnormalities. Simple correlations with pathologic finding were complicated by the fact that many, but not all, women had laparoscopy. Those women who did not have laparoscopy may also have had otherwise undetectable pathologic conditions, but this possibility has been considered

in the conclusions. There is not yet sufficient experience to recommend liberal use of diagnostic laparoscopy in women with a provisional diagnosis of dysfunctional uterine bleeding, but it should be considered in women who do not respond to initial medical therapy or have additional indications in their history.

It is part of the basic dogma of gynecology that leiomyomas are a very common cause of excessive menstrual loss, with submucous and intraluminal polypoidal lesions associated with the highest loss; however, there is little objective information.[9, 16] In this series all the polypoidal myomas were associated with blood losses >120 ml. Surgical removal of these polyps can be followed by an 80% reduction in menstrual blood loss.[9] Submucous myomas were all associated with blood loss >60 ml, and most were >120 ml. There was an indication that superficial intramural and subserous myomas might sometimes cause an increase in blood loss into the moderately heavy range. These superficial myomas may be underrepresented in this study because 36% of the women did not have laparoscopy.

Endometriosis is a controversial cause of menorrhagia,[9] and many gynecologists do not believe that it is a cause of excessive bleeding. Endometriosis is also a very variable condition, and there is no doubt that some cases are accompanied by entirely normal bleeding. Conversely, there is clinical evidence to suggest that some women with endometriosis may have menorrhagia that improves with treatment of the endometriosis.[17] It is also possible that some of the "earlier," or visually less obvious, lesions are the most active in producing symptoms.[14] This study found a fairly high incidence of endometriosis in women with dysfunctional uterine bleeding and a suggestion that "early-mild" lesions may be more likely to be associated with a moderate increase in blood loss. If this association is causal, it is not clear which mechanism is responsible for the increase in blood loss, although an alteration in arachidonic acid metabolism would seem possible. Adenomyosis sometimes causes menorrhagia, and although this is pathologically a different condition from endometriosis, it may also cause disturbances of bleeding through a prostaglandin-related mechanism. Minor degrees of adenomyosis are often found on careful examination of hysterectomy specimens, but it is not clear whether these minor degrees are symptomatically important.

Endometrial polyps are somewhat mysterious lesions with causes and natural history that are little understood. They frequently cause intermenstrual bleeding, but the frequency with which they cause menorrhagia is not known. In this series two patients with moderate-size polyps also had menorrhagia, whereas one did not. Twenty-four cases were seen to have minor degrees of polypoidal endometrium on hysteroscopy, but these were not recognized in histologic examination. It is

thought unlikely that these contributed to the menorrhagia.

Other conditions, such as anovulation with persistent proliferative or hyperplastic endometrium (sometimes caused by polycystic ovarian disease), may cause menorrhagia,[18, 19] but objective measurements are limited. These conditions are more likely to be found toward the beginning or end of the reproductive years, and were probably underrepresented in this series. Pelvic inflammatory disease is thought to be able to cause menorrhagia, but there is little objective evidence to confirm this. This study does not include large enough numbers to draw any conclusions. The clinical association that is sometimes recorded between bicornuate uterus and menorrhagia (including this study) may be coincidental rather than causal.

It now appears that the end of the era of routine blind diagnostic curettage is in sight, and that it should be replaced by the greater precision of hysteroscopy with directed biopsy or curettage.[4, 5] The advent of new, narrow-gauge and flexible hysteroscopes should allow more widespread use of outpatient and office hysteroscopy as a basic investigation in gynecology.

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A new method for gaining entry into the scarred anterior cul-de-sac during transvaginal hysterectomy

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This report describes vaginal hysterectomy in nine patients who had a history of multiple prior cesarean sections. In seven of the nine patients, safe entry into the anterior cul-de-sac was facilitated by the use of a bent uterine sound. (AM J OBSTET GYNECOL 1990;162:1269-70.)

Key words: Vaginal hysterectomy, prior cesarean section

The safety of vaginal hysterectomy after multiple prior cesarean sections has not been well addressed in the literature.[1, 2] The chief concern in such patients has centered around the potential for bladder injury and difficulty in gaining entry into the scarred anterior cul-de-sac.[1] This study reports our experience with a new procedure designed to facilitate safe entry into the scarred anterior cul-de-sac.

Material and methods

From July 15, 1988, to April 14, 1989, 14 patients with a history of multiple prior cesarean sections underwent hysterectomy. Nine of the 14 patients were otherwise deemed appropriate for a vaginal approach and underwent successful vaginal hysterectomy. Five of these nine patients had undergone three and four

had undergone two prior cesarean sections. Two of the nine patients had undergone one prior classic cesarean section. The mean age of the nine patients was 34 years (range, 23 to 50 years). The mean parity was 3 (range, 2 to 4). One of the patients had undergone one and two patients had undergone two prior vaginal deliveries. Indications for hysterectomy were grade 3 cervical intraepithelial neoplasia in four patients, stress urinary incontinence with pelvic relaxation in one patient, persistent menorrhagia in two patients, and leiomyomas in two patients.

All nine vaginal hysterectomies were performed in a standard manner. If visualization of the vesicouterine peritoneum was not clear, an attempt was made to place the index finger around the uterine fundus and into the anterior cul-de-sac as described elsewhere. When this maneuver was unsuccessful, a bent uterine sound was placed through the posterior cul-de-sac and brought around the uterine fundus into the anterior cul-de-sac. Sharp dissection was then carried beneath the tip of the sound until the tip could be seen through the tissue fold, and then the clear area was incised. A finger was then placed through the opening to confirm peritoneal entry. The anterior culdotomy was then widened sharply, and the vaginal hysterectomy was com-