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ORIGINAL ARTICLE

Medical debulking with gonadotrophin-releasing hormone agonists to facilitate vaginal hysterectomy

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Abstract Although the superiority of vaginal compared to abdominal hysterectomy is well established, most gynaecologists still prefer the abdominal route for removal of benign large uteri >14 weeks. Gonadotrophin-releasing hormone agonists such as goserelin can reduce uterine bulk by up to 60% and was initially used to convert a midline to Pfannenstiel incision in abdominal hysterectomy. The conversion of an abdominal to a potential vaginal hysterectomy by uterine size reduction would prove advantageous, and the authors present data from a case control study of 12 women with uteri >14 weeks who successfully underwent vaginal hysterectomy following preoperative treatment with goserelin. Women scheduled for hysterectomy for menorrhagia with non-prolapsing clinical uterine size of >14 weeks were offered an attempt at vaginal hysterectomy after pre-treatment with goserelin. A group of women with comparable uterine size who underwent abdominal hysterectomy for similar indication served as control. Pre- and postoperative data such as haemoglobin, myoma size, uterine weight, duration of procedure and complications were collected prospectively. Both groups had comparable preoperative haemoglobin, subjective preoperative uterine bulk (median 16 weeks) and body mass index. The vaginal hysterectomy group received a median of two goserelin injections prior to surgery, and the uterine weight at histology was similar in both groups (median 580 vs 609 g, $p<0.05$). The duration of surgery was twice as long in vaginal compared to abdominal hysterectomy (153.7 vs 85 min, $p<0.05$), but analgesia use and the length of inpatient stay were lower in the study group (2.62 vs 3.5 days, $p<0.05$). In women with >14 week-size uteri, treatment with gonadotrophin agonists reduces uterine size sufficiently to allow safe vaginal hysterectomy. Although duration of surgery was longer, women who underwent vaginal hysterectomy required less analgesia and had shorter inpatient stay.

Keywords Vaginal hysterectomy · Medical debulking · Gonadotrophin-releasing hormone agonist

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Background

Laparotomy is still the preferred route of surgical access in women requiring a hysterectomy for menorrhagia or fibroid, although it is well documented that intraoperative and postoperative morbidity, analgesia use and hospital stay are significantly lower with the vaginal route [1–4]. The abdominal route could be attributed to personal preference as well as lack of training and experience, and should vaginal hysterectomy (VH) become more widespread, the potential for cost saving and improved patient experience is significant: one study already demonstrated that the cost of abdominal and laparoscopic hysterectomy were 34.5% and 72% respectively higher than for vaginal hysterectomy [5].

The most common reason cited by gynaecologists for favouring abdominal over the vaginal approach is large uterine bulk, and many would be reluctant to attempt VH in patients with an estimated uterine size of 12–14 weeks [6, 7]. Observational and comparative studies by Magos et al. [8], Harmanli et al. [5] and Sahin [9], however, all demonstrate that uteri of up to 20 weeks could be removed vaginally. Interestingly, contrary to accumulating evidence supporting the vaginal approach particularly for this group,

the American College of Obstetrics and Gynecology recommends against vaginal hysterectomy for women with uterine size of >12 weeks.

That the "average practicing gynaecologist, through deliberate effort, could increase his/her VH rate to 95% within 5 years" [10] was a great motivation for us as was the challenge of developing the confidence to progressively increase the size of the uteri that could be removed through the vaginal route (only 3.9% of hysterectomies for fibroid uteri were performed vaginally [11]).

Stoval and colleagues have used gonadotrophin-releasing hormone (GnRH) agonists as a preoperative adjunct to medically debulk uteri, thus enabling hysterectomy, which otherwise would have been approached abdominally, to be performed vaginally [12].

In this study, we present data from a prospective case control study of 12 women with enlarged uteri without prolapse who were treated with a GnRH agonist in order to facilitate vaginal hysterectomy; the control group comprised patients with enlarged uteri who underwent total abdominal hysterectomy (TAH) for a similar indication (i.e. menorrhagia).

Materials and methods

This was a prospective case control study undertaken in a teaching hospital in London over a 2-year period. Between 2006 and 2008, women scheduled for hysterectomy for menorrhagia with clinical uterine size of >14 weeks were offered an attempt at VH after pre-treatment with goserelin acetate. Women in the study group received either one or two intramuscular doses of 3.6 mg of goserelin (Zoladex, Astra Zeneca, Ltd.) while a group of women with comparable uterine size who underwent TAH for menorrhagia served as control; this study therefore achieves Oxford level II evidence. Oophorectomies were not routinely performed in either group.

VHs were performed by two consultant gynaecologists (WY and AF) who were experienced at doing the procedure for prolapse (as part of the repertoire of most trained gynecologists) but were attempting to gain more experience at removing larger non-prolapsing uteri >14 weeks through the vaginal route. TAH in the control groups was performed by consultant gynaecologist colleagues of the two senior authors or senior trainees under their direct supervision. All patients received an intravenous bolus dose of 1.2 g Augmentin intraoperatively and wore antiembolic stockings and/or sequential compression stockings. VH patients had a vaginal pack and indwelling urinary catheter in situ until the following morning. Postoperative pain management included oral narcotics, non-steroidal anti-inflammatory medications and, in addition, patient-controlled analgesia for the first day in the TAH group.

Patient characteristics such as age, ethnicity, parity, body mass index (BMI), uterine size on scan and clinical size at surgery, preoperative administration of GnRH analogues, histological uterine weight and histopathology report were recorded. Peri-and postoperative complications (including surgical, blood transfusion and pyrexia) and other important outcome measures such as change in haemoglobin concentration, operative time and length of postoperative hospital stay were also compared.

Findings

Prospective data from 12 patients were collected from the study and control groups, respectively. The two groups had statistically comparable median age (49 vs 48 years), pre-treatment uterine length on ultrasound scan (12.1 vs 10.5 cm), preoperative haemoglobin (12.8 vs 12.6 g/dl) and BMI (31.72 vs 24.25 g/m^2) ($p>0.05$ in all cases). Women who had VH had higher parity than women who underwent TAH (3 vs 1.5, $p< 0.05$) (Table 1).

The median subjective uterine size of the VH group prior to goserelin injections was 18 weeks (range 15–20 weeks), while the subjective uterine bulk at the time of surgery (median 16 vs 16 weeks) and histological uterine weight (median 580 vs 609 g) were comparable in both groups ($p> 0.05$) (Fig. 1). The subjective median decrease in clinical uterine bulk was thus 11.11%.

The median duration of surgery (137 vs 81.6 min) and estimated blood loss (629 vs 422 ml) (both $p>0.05$) were significantly higher in the vaginal compared to the abdominal hysterectomy group, but this was skewed by

Table 1 Patient characteristics

Patient characteristics	VH (n=12) Median (range)	TAH (n=12) Median (range)	p value*
Age (years)	49 (41–51)	48 (39–51)	NS
Parity	3 (1–4)	1.5 (0–4)	0.04
Uterine length on USS (cm)	12 (9–16)	10.65 (8–14)	NS
Clinical size at time of surgery (weeks)	16 (12–22)	16 (12–22)	NS
Previous abdominal surgery	1/12	2/12	NS

NS not significant

*$p<0.05$ is taken to infer statistical significance

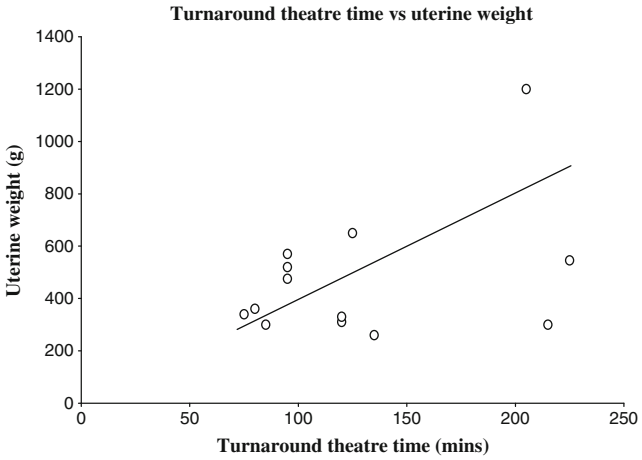

Fig. 1 Uterine weight vs duration of surgery

an outlier in the VH group whose specimen weighed 1,200 g. Analgesia requirements and length of inpatient stay were significantly lower in the VH group (2.41 vs 4.1 days, $p<0.05$) (Table 2). Nine of the 12 TAH patients required intramuscular opioids postoperatively compared to only one in the VH group.

Serious postoperative morbidity was minimal in both groups: in the VH group, two women had pyrexia (>38°C) postoperatively which resolved within 24 h with antibiotics, and the patient who had the 1,200-g uterus removed required two units of blood for blood transfusion.

Conclusion

Hysterectomy remains one of the commonest gynaecological operations, and the Cochrane review on the subject [13] concluded (on the basis of safety, reduced postoperative pain, shortened length of stay and higher patient satisfaction) that VH should be performed in preference to TAH, and if not possible, then a laparoscopically assisted approach may then be used. Furthermore, both Harry Reich and Ray Garry, pioneers of laparoscopic hysterectomy, agreed that "evidence based studies support the use of vaginal hysterectomy if possible over laparoscopic and abdominal hysterectomy" [14, 15]. Despite this, there is still reluctance for gynaecologists to perform VH, particularly in the absence of prolapse and when the uterine size exceeds 12 weeks. In fact, only 15% of hysterectomies for fibroids in the USA [16] were performed vaginally, although many authors have now reported successful vaginal removal of enlarged uteri of up to 20 weeks [8, 9] using techniques such as bisection, Lash intramyometrial coring, vaginal myomectomy and wedge resection.

Stovall and colleagues were the first to describe the concept of medically debulking the enlarged uterus to facilitate VH and were able to show a success rate of 70% for uteri between 14 and 18 weeks. When translated in to cost analyses, significant potential savings could be made, which would easily compensate for the cost of preoperative GnRH analogues expenditure [17]. Previous costing by Johns and colleagues from the USA [18] indicated that the average hospital charge for VH was US $700 less than TAH (US $5,869 vs $6,552) while more contemporaneous data from the UK suggest similar reimbursement tariffs for both VH and TAH but more net profit with the former because of the shorter duration of inpatient stay.

While laparoscopy is a useful adjunct to VH when extensive adhesiolysis is contemplated or when there is suspected adnexal pathology, we concur with previous authors [2, 8, 10] that laparoscopic assistance is not otherwise necessary for the vaginal removal of a moderately enlarged uterus.

Our study corroborates the previous findings that the neoadjuvant use of GnRH analogues can help facilitate vaginal hysterectomies in moderately large uteri and further demonstrates positive advantages compared to a cohort of patients with similar uterine size at surgery who underwent TAH. We admit that our case control series is neither large (12 women in each group) nor randomised and thus can be subject to type II bias. We are also aware that many exceptional vaginal surgeons are able to remove large uteri even without the use of GnRH analogues. Our study simply seeks to suggest that medical debulking using GnRH analogues can convert an abdominal to a potentially safe VH and is a simple and cost-effective way through which an "average" gynaecologist can improve skill and confidence in attempting the vaginal route. We feel that in the

Table 2 Peri- and postoperative outcome measures

Outcome measure	VH ($n=12$) Median (range)	TAH ($n=12$) Median (range)	p value*
Theatre turnover time (min)	153.7 (80–225)	85 (50–170)	0.01
Estimated blood loss (ml)	629 (200–1,600)	422 (100–700)	NS
Histological uterine weight (g)	580 (475–1,200)	609 (450–1,218)	NS
Length of stay (days)	2 (1–5)	3.5 (3–9)	0.02
Postoperative pyrexia >38°C	2	0	NS
Transfusion	1	0	NS

NS not significant

*$p<0.05$ is taken to infer statistical significance

first year of our study, size regression achieved with goserelin gave us the confidence that VH for the "bulky" uteri is possible and motivated us to attempt removal by the vaginal route unless otherwise contraindicated. Through deliberate effort and building on experience as a result of this study, both senior authors have been able to remove progressively larger uteri so much so that analogues are currently used only for trial of VH >20 weeks or to effect amenorrhoea in order to maximise preoperative haemoglobin.

There is therefore little doubt that with sufficient impetus, motivation and training, units can increase their vaginal hysterectomy rates for non-prolapsing uteri from under 40% to nearly 100% over a period of a few years [10].

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