Expert Review  The Gynaecological Pelvic Examination

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Abstract  Knowledge of the principles of the bimanual examination aids the evaluation of pelvic pathology. We discuss evidence from a literature search relating executing the examination, suggest a logical sequence, and where appropriate review anatomical and pathological concepts to aid interpretation of examination findings. Word Count: 2,208 (excluding abstract, figures, tables, legends and references).

Key words: gynaecology, pelvic examination, bimanual, clinical.

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Introduction
The gynaecological pelvic examination is performed both in general practice and secondary care settings, for a spectrum of indications. It is an essential component of the complete gynaecological examination (box 1). Done skilfully it can reveal specific pathology of the female reproductive tract.

As with all examinations, practice, preferably under the supervision of an experienced mentor, is the key to adopting a confident approach. For the bimanual examination, such experience can be difficult to achieve: the ‘intimate’ nature of the examination leads to some students, particularly males, and also some mentors feeling that it is inappropriate to practice on patients. Such an approach may lead to the examination being rushed with the stages not given correct and detailed consideration.

With this paper we present a logical approach to the pelvic examination, where possible referring to basic principles and justifying our practice with evidence [1]. It is intended to assist professional development for medical students, foundation doctors, O&G trainees, GP trainees, A&E doctors, and other healthcare professionals.

Methodology
Initial discussion with, and observation of Consultant Gynaecologists and Urologists was undertaken, with consultation of common UK medical undergraduate textbooks to clarify a level of ‘expert opinion’. Literature review was then undertaken using PubMed. Search terms included ‘Bimanual [pelvic] OR [gynaecological] examination’ OR ‘gynaecological examination’. For non-English language publications only the abstracts were read. Once useful articles were identified from the basic search, a ‘related articles’ search was obtained. Where non-PubMed referenced peer-reviewed literature was known to the authors, this was consulted.

Context of the Examination

When in the Consultation Should the Examination be Undertaken?
Where indicated, the bimanual examination should occur after taking a full history. In conjunction with a speculum examination it is the cornerstone of the gynaecological examination. They are normally preceded by abdominal palpation and a general examination (or examination of a specific system if indicated). Penetrative vaginal examination is not appropriate for those with an intact hymen (virgo intacta).

When to Practice the Bimanual Examination?
In any situation it is important that the woman gives informed consent; that this has been obtained should be briefly documented in the notes. Make your name and professional title clear.
Opportunities to undertake the examination under supervision most commonly arise in the gynaecological outpatients (general or specialised), genitourinary medicine and family planning clinics. Patients referred for secondary care appointments generally anticipate and may have previously experienced a bimanual examination. They may know what to expect and be less anxious, and therefore willing to engage in student training; conversely they may be more apprehensive based on a previous bad experience. In all situations, prior discussion with your supervisor is likely to yield more opportunities to carry out examinations.

Examination of the anaesthetised woman prior to commencement of her operation can present a good opportunity for learning, due to abdominal and vaginal muscle relaxation and patient sedation. For ‘teaching examinations’ informed written consent must be obtained at the time of consent for the procedure. The anaesthetised setting does not allow the practice of the professional behaviour and communication surrounding the examination.

Artificial manikins are available that simulate the pelvic examination. Clinical teaching assistants (CTAs, or ‘professional patients’; laywomen trained in examination of the pelvis) have a role prior to student clinical placements. A cohort of UK students who initially practiced examinations on CTAs demonstrated significantly superior examination technique compared to a non-CTA trained cohort [2]. CTAs are not a complete substitute for practicing in the clinical setting on ‘real’ patients. As with any physical skill the reliability of pelvic examination increases with experience [3].

Preparation required
Preparation is more important for the bimanual examination than many other systems. An uncomfortable and anxious patient will contract her abdominal and vaginal muscles, lessening the value of palpation and increasing distress. Qualitative studies suggest that even women who have had several pelvic examinations are ambivalent towards the procedure, with that empowerment being achieved through appropriate preparation [4]. The preparation we describe comes in two stages: that of the examiner and that of the patient.

For the Examiner
Confirm the patient’s identity. Give the woman adequate time and privacy to undress (e.g. stand behind a screen/curtain around the couch). The examiner should ensure gloves, lubricant, speculum, spatula and swabs are to hand. Wash the hands, don the gloves and before proceeding to the examination ensure the examining digits (for most, those of the right hand) lubricated. The speculum examination, cervical smear and swab taking may precede or follow the digital examination, depending on the indication (see table 1). Women describe the speculum examination as more distressing than the bimanual examination [5]; thus doing it before the bimanual examination may lead to undesirable tensing of the abdominal muscles. Other advantages of it following the examination include enabling the clinician to determine the most appropriate size of the speculum to use. If you suspect cervical bleeding, it may be preferable to visualise the cervix first. Discuss this with your supervising clinician if unsure.

For the Patient
Explanation
A full explanation of the indication for the examination should be given. Details of the procedure should be given in lay language. To facilitate estimation of uterine size, the woman should be asked to empty her bladder. Traditionally this step was omitted if the indication for the examination was stress incontinence or prolapse, however this is controversial: genuine stress incontinence may be demonstrated with as little as 20ml in the bladder. Consideration should be given as to whether urine is required for further testing (e.g. beta-hCG, urinalysis, microscopy culture and sensitivity, or cytology). Remember: sonographers may require a full bladder for scanning.

Chaperone
The Royal College of Obstetricians and Gynaecologists recommends that examiners in all settings and of either sex should offer the woman a chaperone, who should be a healthcare professional. Relatives of the patient are not ideal. The name of and position held by the chaperone should ideally be documented in the notes.

Environment
The patient should be offered the privacy of preparing for the examination in a separate cubicle or curtained-off area. An adjustable light should be available. The temperature should be appropriate. A quiet area is preferable to a thoroughfare in the emergency department.
Position
Aim to balance patient comfort with visibility and access. The dorsal position is most commonly employed, where the woman lies on her back with her feet together, her legs flexed at the knee and the hips abducted (figure 1). Many women find this position reasonable but if they prefer their feet separated and flat on the couch this is equally acceptable (figure 2). Either position will expose the vulva and perineum acceptably. There is some data (from adolescents) that a semi-prone position reduces anxiety [6], but there is not data to suggest if this has a deleterious effect on examination sensitivity. A feeling of ‘over-exposure’ may be avoided by covering the abdomen with a clean sheet. The lithotomy position is rarely used in the outpatient clinic, being reserved for when procedures are being undertaken. The lateral position is commonly used while examining for prolapse and when using Sims’ speculum. In the 1980s around 13% of gynaecologists performed bimanual examinations in the lateral position [7]; this is no longer in general use but there is no data to suggest whether this position decreases information yielded from the examination.

Procedure

Inspection
Begin by noting the presence or absence of pubic hair. Observe from the labia majora infero-medially, noting the labia minora, clitoris, urethral meatus, introitus, perineum, and anus. Common signs are described in table 2.

Open the introitus with the thumb and index finger of the left hand (or index and middle fingers if preferred), around the upper two-thirds of the labia. Avoid the clitoris. Note discharge, bleeding, or the presence of prolapse. Asking the woman to cough and strain may reveal stress incontinence and/or uterovaginal prolapse. It may be necessary to ask the woman to cough when standing in order to confirm a history of stress incontinence.

The Bimanual Examination
Insert the index, and if possible the middle finger (figure 3). Note the condition of the vaginal walls (particularly friability, suggestive of atrophic vaginitis/a post-menopausal state). Palpate around the cervix for areas of irregularity, tears, or polyps. The sign of excitation (pain on moving the cervix) is a sign of pelvic inflammation (e.g. endometriosis, pelvic inflammatory disease/infection, or ectopic pregnancy). The attitude of the cervix can be informative – if the cervix points into the posterior fornix this usually signifies an anteverted uterus, a cervix pointing into the anterior fornix usually indicates a retroverted uterus. Retroversion is a normal variant found in fifteen percent of women, for whom the uterus may not be easily palpable bimanually per vaginam. A uterus fixed in retroversion would indicate pathology.

The internal fingers are then placed behind the uterus and are used to lift the organ forward. The finger pads of left hand are placed below the umbilicus, and swept inferiorly until the uterus is felt between the two hands. The organs are palpated between the two hands, most information coming delicately from the vaginal fingers. The uterus is palpated for its position, consistency, mobility (or immobility implying adhesions – table 3), regularity/symmetry (for the presence of any tumours), and size. Clinical estimation of uterine size (table 4), particularly in pregnancy, is usually confirmed by ultrasound measurement. Clinical estimates, however, have been shown to correlate closely with post-operative specimen size in a variety of benign gynaecological conditions [8].
Carefully move the fingers in the vagina into the right fornix, palpating the right adnexum (the ovary and fallopian tube). Then gently raise the right tube and ovary towards the external hand (which should be sequentially brought from the umbilicus into the right iliac fossa, medial to the anterior superior iliac spine). A similar evaluation of the left adnexum is made. Normal adnexa are difficult to feel unless the patient is thin or a corpus luteum is present (the ovaries are approximately 3x2x1 cm, 10 g; compare to 3x2x1" for the uterus). Large ovarian masses and tubal masses (such as hydro- and pyosalpinges) tend to progress towards the midline and rise into the abdomen. On bimanual palpation these masses usually move independently to the uterus, and vice versa, however an exception to this rule is where the presence of adhesions connects two masses. A ‘frozen’ pelvis describes where the pelvic organs feel fixed and nothing moves. In the presence of significant uterine enlargement it may be difficult to detect ovarian pathology. Benign fibroids can mask ovarian tumours. Bimanual examination is unreliable for distinguishing between benign and malignant ovarian carcinoma.[10]

A finger is passed into the posterior fornix. Thickening and tenderness of the uterosacral ligaments posterior to the cervix are characteristic (but not diagnostic) of endometriosis.

**The Rectal Examination in Gynaecology**

Embryologically and anatomically the lower genital and anorectum are closely related, and gynaecological conditions (malignant and benign) can involve this region. Rectal examination, while uncommon in general gynaecology, may be useful in special circumstances: it may facilitate palpation of a retroverted uterus, the uterosacral ligaments, swellings in the pouch of Douglas, evaluation of an enterocoele or rectocoele and detection of primary rectal tumours. A combined rectal and vaginal examination may be used in gynaecological-oncology settings to evaluate the malignant invasion into the parametrium and along the pelvic ligaments.

**The Bimanual Examination in Urology**

Bimanual vaginal examination may be used by Urologists to evaluate bladder wall invasion of bladder tumours. There is little data correlating this with pathological findings.

**Completing the Examination**

Once completed, inform the patient that you have finished. The patient should be given some tissue with which to wipe away any remain lubricant used for the examination. The examiner will wash after de-gloving. Allow her privacy to dress. The findings and significance of the examination should be discussed only once the woman is dressed, seated and ready to accept the information.

**Conclusions and Discussion of the Evidence-Base to the Examination**

The bimanual pelvic examination is an important skill that can reveal useful information to aid a diagnosis. Despite the common nature of this examination, there is relatively little data to inform examination procedure. In the evaluation of CTAs, examination technique of students was monitored, but the comparator was that of expert opinion rather than an evidence based protocol.

One study (albeit now dated) suggested an elective pelvic examination undertaken by a senior doctor can be as specific (94%) at detecting intra-abdominal pathology as transabdominal ultrasound, albeit with a lower sensitivity (83% vs. 67%) [10]. Even this low sensitivity may be an overestimation of how genuine pelvic pathology can present without examination findings; of 91 women with laparoscopically-identified endometriosis 47% had apparently normal bimanual examination findings [11].

The information revealed can be limited, particularly in emergency cases, by guarding or rigidity as a result of pathology, pain and anxiety (causing abdominal wall tension and obscuring of the organs), probably why emergency department examinations have found to have low inter-operator reliability [12]. However, bimanual palpation remains a widely employed tool to evaluate disease and guide appropriate investigation, and therefore must be learned, despite potential difficulties in establishing opportunities to practice.

**Acknowledgements**

We would like to thank our photographic model and Dr D Abousaid for the diagram.

**Conflicts of interest**

None

**References**


[2] Pickard S, Baraitser P, Rymer J, Piper J. Can gynaecology teaching associates provide high quality effective training for medical students in the


Preparation: introduce, greet, consent, explain, warm/wash hands, gloves, setting, position, exposure

General inspection*

Abdominal palpation*

Urinalysis – including beta-hCG*

Vulval and perineal inspection

Bimanual examination

Speculum examination**

- Smear if indicated*

- Swabs (high vaginal, low vaginal, cervical) for MC&S or ELISA if indicated*

Potential further investigations: Urinalysis – including beta-hCG*, urine MC&S and cytology*, urodynamic studies*, serial serum beta-hCG*, ultrasonography (transvaginal or transabdominal) *, hysteroscopy*, laparoscopy*

*Not considered in this article

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<th>Table 1</th>
<th>Stages of the gynaecological examination (including suggested additional investigations)</th>
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<tr>
<td>Hair distribution – towards the umbilicus or down the thighs may suggest hirsutism (n.b. there is considerable variation in the normal amount and distribution of hair between ethnic groups). A natural, not waxed, absence of pubic hair may indicate testicular feminisation (complete end-organ insensitivity to testosterone).</td>
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<td>Vulval pathology – lichen sclerosus, epilation folliculitis (shaving rash), Candida albicans, Herpes, warts, lice, scabies, gonorrhoea, intra-epithelia neoplasia (Bowen’s disease), squamous cell carcinoma, vitiligo</td>
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<td>Clitoris – genital mutilation (certain ethnic groups), piercing</td>
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<td>Introitus – the cervix or vaginal wall may be visible, indicating prolapse, presence of discharge, imperforate hymen (virgo intacta)</td>
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<td>Perineum – recent trauma, scarring (e.g. post-episiotomy), excoriations</td>
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<td>Anus – general pathology including haemorrhoids, nematodes, fissure</td>
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<th>Table 2</th>
<th>Potential inspection findings (this list is not exhaustive)</th>
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<td>Pelvic inflammation e.g. endometriosis, pelvic inflammatory disease/ infection</td>
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<td>Previous pelvic or abdominal surgery</td>
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<td>Malignancy; e.g. ovarian, advanced endometrial, cervical (tubal cancer is rare).</td>
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<th>Table 3</th>
<th>Typical causes of uterine adhesions, manifesting as a fixed uterus</th>
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<td>Normal, non-pregnant uterus (7x5x3cm / 3x2x1in / 40g)</td>
<td>Small pear</td>
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<tr>
<td>6 weeks pregnant</td>
<td>Tangerine</td>
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<tr>
<td>8 weeks pregnant</td>
<td>Apple</td>
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<tr>
<td>10 weeks pregnant</td>
<td>Orange</td>
</tr>
<tr>
<td>12 weeks pregnant</td>
<td>Grapefruit</td>
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<tr>
<td>14 weeks pregnant</td>
<td>The uterus in a non-obese woman is usually palpable abdominally without the uterus needing to be lifted [9].</td>
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<th>Table 4</th>
<th>Uterine size in pregnancy: One common, although potentially confusing, method of estimating the gestation of a uterus palpable through the abdomen is to compare it to fruit.</th>
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Figure 3  Schematic diagram of the bimanual examination.