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Benign conditions of the genital tract

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VAGINAL MALFORMATION

A number of vaginal malformations have been described. The vagina may be inaccessible because of an intact hymen. It also can be malformed by a transverse (horizontal) or vertical (longitudinal) septum. In the presence of a transverse septum, menstrual blood may not pass freely and a hematocolpos may also be present. Vaginal examination should easily identify the obstruction, and hematocolpos can be detected either by the presence of a tense fullness behind the septum, or with the aid of an ultrasound examination which will further delineate its extent and whether the uterus is itself dilated with further menstrual fluid collection. A cruciate incision under general anesthesia is generally all that is required to correct this abnormality. A partial or subseptum can be high or low in the vagina. The lower it is the better is the prognosis for pregnancy, and complete excision can be achieved. Excision can also be achieved by using a CO₂ laser. This results in very little surgical trauma and minimal scar tissue is created. The prognosis for pregnancy is good for a low septum and much reduced for a high septum.

A vertical (longitudinal) septum may be present in variable lengths up to a complete separation of the vagina creating two cavities. This can occur as either a high or low septum or a complete partition of the vagina. There have been instances where normal vaginal delivery has occurred alongside a longitudinal

septum through one of the compartments. If such a defect is detected before pregnancy, a CO₂ laser excision or other appropriate surgical treatment can remove the septum and facilitate creation of a normal functioning vagina. It is usual for women who are preconceptual to complain if they have this condition, because they experience difficulty in inserting a tampon or dyspareunia when attempting to have normal vaginal intercourse. The treatment results are usually excellent.

Vaginal atresia

The vagina develops from the cloacae and is usually covered with squamous epithelium. Because of its proximity to the anus, which develops from the same epithelial anlage, similar malformations to those of the anal canal may occur. Vaginal atresia may be associated with an absence of rudimentary development of the uterus known as the Rokitan-sky syndrome, most commonly presenting at puberty with amenorrhea or cryptomenorrhea in the presence of normal secondary sexual characteristics. If the use of regular vaginal dilators fails, then a variety of surgical techniques performed in collaboration with a plastic surgeon could be beneficial.

If the uterus is underdeveloped and has failed to connect with the vagina then surrogacy would seriously have to be considered as a childbearing option.

UTERINE MALFORMATION

A variety of uterine malformations have been described varying from a unicornuate uterus (Figure 1) to complete division or duplication of the uterus, commonly described as a double uterus with two horns separated in its low end, along with two tubes and two ovaries¹. These patients are usually asymptomatic but may present with fertility problems, recurrent miscarriage, scanty menstruation and painful or heavy periods. They are susceptible to pre-term labor and abnormal presentation of the fetus. An ultrasound scan can identify the condition well before pregnancy.

A unicornuate uterus has a high miscarriage and premature labor rate which may lead to anything from extreme prematurity to late prematurity and immature development of the fetus. It is commonly acknowledged that if a unicornuate uterus has carried a pregnancy to term the prognosis is good for subsequent pregnancies.

The well known Strassman's operation, which involves incision at the uterine fundus from one horn to the other transversely and then re-suturing anteriorly and posteriorly to create a larger cavity, theoretically may enable the patient to carry a pregnancy to a more advanced gestation. Though such corrective



Figure 1 Patient aged 35. Unicornuate uterus with congenital absence of left tube and ovary. Copyright Mr C. B-Lynch 2009

surgery can be performed, the benefit of successful and advanced pregnancy is by no means guaranteed. Some forms of bicornuate uterus may have a redundant horn or a dominant horn. If pregnancy occurs in the redundant horn, the chance of ectopic pregnancy or rupture of the uterus is higher. In some cases a redundant horn can obstruct the passage of the fetal head into the birth canal from the pregnancy that is in the dominant horn. Careful evaluation is important to understand the nature and extent of the problem well before pregnancy occurs.

When a septum is discovered within the uterine cavity, it is appropriate to remove it using a hysteroscopic approach, which is commonly followed by an immediate insertion of an intrauterine contraceptive device of the Mirena type for 6 weeks to minimize adhesion formation.

The numerous varieties of malformation make it imperative that during the course of investigating patients for infertility all clinicians undertake proper physical examination to exclude abnormalities of the genital tract¹.

GENITAL WARTS

Genital warts commonly present in young women, often before they become pregnant. The method of transmission is still unclear, although the causative viral agent is well known. The vast majority of cases are managed in the specialist genitourinary medical clinic; although in many countries management is in the hands of generalists or obstetricians/gynecologists. Some centers provide medication for self application at home with the inherent pitfalls in managing such a condition effectively (especially when the warts are extensive) by this protocol. Guidelines are available from von Krogh *et al.* and the Health Protection Agency^{2,3}.

In the UK about 71,000 new cases of genital warts are reported annually by genitourinary

medicine clinics. A common association with *Chlamydia* infection is present. Women with these conditions experience local irritation of the vulva and vagina as well as marked anxiety. Human papillomavirus (HPV) is the cause of infection and has the associated risk of cervical cancer at a later date in some individuals, as HPV types 16 and 18 are found in most cases of cervical cancer. As such, the infection is a particularly relevant condition for discussion in terms of preconceptional medicine. Following initial diagnosis, the behavior in pregnancy is unpredictable. Often the pregnant state is associated with marked growth of the warts which, if not treated in a timely basis, can become problematic in terms of general comfort and, in some instances, locomotion. When neglected, obstruction of vaginal delivery is a possibility. It is probable that the immunosuppressive effect of pregnancy may opportunistically charge these viral eruptions to proliferate. Currently young adolescent women are offered immunization, but evidence of the long-term effectiveness of this program is awaited. Genital warts can be found anywhere around the tract of the female genitalia including the introitus, vulva, vagina and cervix⁴.

Diagnosis

Most cases of genital warts are diagnosed by visual appearance with the individual lesions displaying characteristic warty heads. These are contagious and can be passed onto the male and vice versa. Collaboration with a dermatologist is often helpful, because the differential diagnosis includes uninfected skin lesions including malignancies. It is essential not to confuse sexually transmitted diseases with other genital warts such as molluscum contagiosum which are flatter eruptions of the vulva and contain central cheesy material. Another consideration should be condyloma lata of secondary syphilis which are softer more fleshy lesions especially confined to the peri-

anal region. Appropriate blood screening tests could differentiate these various diagnoses.

Treatment is not always necessary, as a proportion of these warty lesions resolve spontaneously⁵. However, many clinicians will treat all cases because it is not possible to distinguish those lesions which regress spontaneously.

Treatment

For mothers who are contemplating and planning a pregnancy it is prudent to treat visible lesions before becoming pregnant. No treatment modality can be guaranteed to be 100% effective and relapses can occur. Treatments such as podophyllin and imiquimod can be applied. Long-term toxicity (especially if lesions are large) may mean using an alternative such as podophyllotoxin. This is a cytotoxic agent with the active component of podophyllin. It is applied as a cream base and is effective in young women. Other treatments such as imiquimod, cryotherapy and trichloroacetic acid are recommended either in isolation or in combination⁶.

In pregnancy warts tend to grow quite rapidly. Small warts can be treated conservatively; larger warts can be excised even in pregnancy. Cervical warts should be excised using the laser, and when warts are large and invading the vagina, serious consideration should be given to delivery of the baby by cesarean section. Transmission from mother to baby can occur if lesions are present in the vagina. Pediatric manifestations of genital warts include laryngeal polyps of the infant and toddler.

Treatment with podophyllotoxin should be avoided in pregnancy because of concerns regarding potential toxins. Urethral warts can be cauterized. In pregnancy, surgical removal of localized warts is recommended, but recurrence may occur after apparent surgical clearance.

Because the chances of greater proliferation of wart viral changes could be high in patients who are HIV positive and pregnant, these

individuals should be managed jointly between the sexually transmitted disease unit and the HIV consultant. It is also good practice to screen for other sexually transmitted diseases in patients who request HIV screening, regardless of whether they are pregnant at the time of the request.

Ideally, patients with genital warts should have annual cervical smears before becoming pregnant. Genital warts are rarely associated with oncogenic HPV infections. Transmission of genital warts can be controlled by the use of barrier methods of contraception such as the condom, which may prove valuable preventive measures against other HPVs³.

Summary

Key points regarding genital warts include:

- The diagnosis of genital warts is usually a clinical one
- HPV 6 and 11, which are not associated with an increased risk of malignancy, are associated with 90% of wart infections
- Most patients can be treated at home with topical agents such as podophyllotoxin or imiquimod
- All treatments, including ablative treatment, have a relapse rate of around 30%
- Warts have a natural history and may regress spontaneously
- No treatment is always an option
- Screening for other sexually transmitted infections (STIs) should be routine for any patient presenting with genital warts
- Currently, vaccines are available to inoculate against HPV infections of malignant potential. Evidence of their long-term effectiveness is eagerly awaited.
- All wart virus infections have the capacity to grow in pregnancy when the immune response may be suppressed.

BENIGN TUMORS OF THE BARTHOLIN'S GLAND

The Bartholin's glands provide appropriate secretions following sexual stimulation to prevent or minimize friction during sexual intercourse.

From time to time, obstructions of the ductal aspect of the gland cause swelling, pain and/or edema of the gland or infection by bacterial tracking of the duct which causes inflammation of the gland leading to abscess, intense pain and fever. This organ is sometimes described as the greater vestibular gland in the lower third of the labia majora. Inflammatory changes can occur at any time before or during pregnancy, causing pain and discomfort along with fever or abscess formation. Active and urgent management is indicated.

Independent of the Bartholin's gland, superficial vulval cysts may or may not become secondarily infected. Most often, they are asymptomatic and require no treatment even in pregnancy other than to occasionally discharge a cheesy-like substance. In such instances, excision in conjunction with antibiotics of appropriate culture and sensitivity may be considered.

Changes in vulva pigmentation need advice regarding further management as 10% of pigmented lesions can become malignant melanomas. In pregnancy, pigmented lesions are particularly susceptible to further changes, and the pigmentation *per se* probably reflects the immunosuppressant effect of pregnancy.

VULVAL INTRAEPITHELIAL NEOPLASIA

Vulval intraepithelial neoplasia (VIN) is commonly a feature of squamous origin (Bowen's disease or Bowenoid papulosis), in which grading the severity of changes depends on clinical appearance as well as histology not unlike the grading of cervical intraepithelial neoplasia (CIN). The lesion might have a rough surface

and be flattened like vulval wart infection but can also appear with indistinct borders. Paget's disease can present with similar appearances to VIN. These are also uncommon and have demarcated borders, are very commonly multifocal, are eczematoid in character and are associated with 25% of adenocarcinoma within the pelvis, perianally or at distant sites. The recommended treatment is wide excision of the focal lesion in consultation with a colorectal surgeon preoperatively.

CERVICAL INTRAEPITHELIAL NEOPLASIA

Lesions of this type are premalignant conditions, and many women have had abnormal smears prior to pregnancy. The various classifications of such abnormalities include terms such as mild, moderate or severe dyskaryosis. These gradings mainly indicate changes in the cellular pattern from mild to severe in progression which signify high or low risk.

Liquid based cytology was recently introduced to achieve more robust detection of the presence of abnormal cells and their character. This process also enables the non-visible type of wart virus that may be present on the cervix to be identified and classified as to which group it belongs, including HPV 16 and 18 both of which have malignant potential.

Following an abnormal smear report, the patient should have a colposcopic examination. The biopsy taken at the time of this procedure will diagnose and classify the abnormality into a high or low risk category (CIN high or low grade)⁷.

The impact of this procedure in pregnancy is now well recognized. Biopsy is commonly performed as a loop excision of the transformation zone (the boundary is where the glandular cells border the squamous cells). This border may harbor 95% of the abnormal cells of precancer or cancer origin. Some cervixes have a larger surface area of abnormality than

others. The larger is the surface area of abnormality, the greater is the chance of scar tissue formation after the loop excision procedure. Sometimes the scarring is sufficient to interfere with conception and in other instances in the process of parturition. It is common to warn patients who have had loop excision surgery of these risks and for health care personnel to assess the cervix when patients are in labor and possibly explain any slow progress.

A cone biopsy is sometimes necessary for high grade colposcopic lesions. This operation, which removes the abnormal area along with normal tissue in a cone shaped specimen is usually performed under regional or general anesthesia, either as a cone loop excision or knife cone biopsy. Unfortunately, the cervix may be shortened or scarred significantly afterwards, and, in a worst case scenario, may lead to difficulty in passing menstrual blood and/or retention of menstrual blood in the uterine cavity (hematometra) along with considerable pain. This latter condition is relieved when the cervix is dilated to empty the uterus. It is important only to dilate the cervix to a reasonable diameter so as not to cause cervical incompetence or interfere with the integrity of subsequent pregnancy. Follow-up Papanicolaou smear may become necessary even in the early part of pregnancy. Most other investigations, including follow-up smears after successful treatment, can be performed 3 months after the postnatal period.

MENORRHAGIA AND DYSMENORRHEA

The quantity and significance of heavy periods is usually difficult to assess^{8,9}. The classical categorization of heavy periods describes approximately 40 ml with 70% loss in the first 48 hours in the healthy European population. As this is a subjective definition, the clinical impact of excessive bleeding is assessed based on the clinical features described by patient including tiredness, listlessness, pallor as well

as anemia when assessed by hemoglobin values¹⁰. Menorrhagia commonly leads to iron deficiency anemia. The impact of which is even more significant in the less developed world where a patient might attempt to accomplish the activities of daily living with hemoglobin levels at half the value of those of women in the western world.

Menorrhagia is one of the main reasons for seeking medical advice, and was a common indication for hysterectomy as late as the 1980s when about 40% of women having a hysterectomy listed this reason for seeking surgical therapy. In the UK, 1 in 5 women have their uterus removed by the age of 55, albeit with a significant proportion of the pathology reports showing a normal uterus, with dysfunctional uterine bleeding having been the principle cause of heavy periods¹¹.

The introduction of ablative therapy has reduced the incidence of hysterectomy dramatically since the 1990s¹². Currently, surgical procedures such as hysterectomy are balanced against the potential associated mortality and morbidity risks of these operations versus the far lesser morbidity of the ablative regimens.

Most women with menorrhagia also complain of dysmenorrhea, particularly women in the fertile age group and where other causes of heavy periods have not been excluded such as fibroid uterus, endometriosis, pelvic inflammatory disease (PID) and malignant or pre-malignant conditions of the uterus. In a significant proportion of instances of dysmenorrhea, the character may be congestive or spasmodic, although usually with congestive dysmenorrhea pain appears before bleeding starts and promptly decreases in severity during the flow. In contrast, the spasmodic variety worsens with menstrual flow past the first day.

It is important to understand this difference, because women who have spasmodic dysmenorrhea may well have endometriosis or adenomyosis that needs early diagnosis and therapy. The presence of dysmenorrhea should alert the clinician to perform appropriate investigations

and then to consider the consequence of these examinations on the patient's fertility potential. In this regard, preconceptional diagnosis not only determines the feasibility of pregnancy and its uneventful progress but also diagnoses conditions the treatment of which facilitates pregnancy¹¹.

Because endometriosis is a classic cause of spasmodic dysmenorrhea and dyspareunia, a diagnostic laparoscopy could reveal this early enough to enable appropriate treatment. Such investigations may also provide the opportunity to assess tubal and ovarian function characteristics (Figure 2).

UTERINE FIBROIDS

Fibroids are benign tumors the size and location of which are variable. As such they can be submucosal, intramural, subserosal, intra-cervical or pedunculated and in the broad ligament. Fibroids are well circumscribed, with a whorl type of soft tissue, appearing in approximately 20% of women of reproductive age, many of whom are asymptomatic.

They are extremely common in the Afro-Caribbean population where most women tolerate their symptoms remarkably well even



Figure 2 Patient aged 32. Bilateral ovarian endometriosis in pouch of Douglas (the kissing ovaries syndrome). Copyright Mr C. B-Lynch 2009

though they are often anemic. A significant proportion of patients with fibroid tumors are reluctant to have any form of surgical intervention.

The introduction of interventional radiology (embolization) has presented a new option for the management of fibroids. In 2004 the National Institute of Clinical Excellence (NICE) provided guidance for clinicians to consider uterine artery embolization for the treatment of fibroids, although it is important to note that currently no concrete data exist pertaining to the effectiveness or outcome of embolization procedures for treatment of fibroid tumors, including the preservation of fertility potential, or the reduction of potential fecundity in patients who wish to conceive. The NICE document comments on indications, means of performance of the procedure, ethics, safety and reduction in mean fibroid volume and blood loss¹³. Counseling and consenting of such women is essential for those who consider this alternative procedure in the management of fibroid uterus¹. Uterine artery embolization should not be recommended without careful consideration in the treatment of symptomatic uterine fibroids, endometrial polyp or submucosal fibroid¹.

Women who have had the uterine cavity open during a prior myomectomy should be offered cesarean section when they become pregnant to minimize or avoid the risk of uterine rupture.

Conjunctive medical treatment

Medical treatment for fibroids and menorrhagia can be achieved by the use of mefenamic acid, tranexamic acid, non-steroidal anti-inflammatory drugs (NSAIDs) or antifibrinolytic agents. All are useful medical treatment for menorrhagia, but are not effective in every patient. Commonly in fibroid menorrhagia, one or another of these agents may control bleeding but not the pain. If the pain persists,

the patient becomes reluctant to persevere with medical treatment.

The luteinizing hormone releasing hormone (LHRH) analogue (goserelin) is used to shrink fibroids and control bleeding by suppressing ovarian function, generally as pretreatment for myomectomy or prehisterectomy for very large fibroids. Decapeptyl 3 mg injection on a monthly basis for 6 months or goserelin 3.6 mg monthly by injection for the same duration are both acceptable. Patients administered either of these medications should be warned about the side-effect of premature chemical menopause and might need some adback treatment such as tibolone or low-dose estrogens to reduce the disturbing effect of estrogen withdrawal.

ENDOMETRIOSIS

The etiology of endometriosis is unknown. Common clinical features suggest ectopic deposits of endometrial tissue outside the uterine cavity itself or ectopic location within the myometrium *per se*, when the condition is termed adenomyosis. Apart from heavy menstruation, endometriosis is characteristically associated with severe dysmenorrhea of the spasmodic type. The location of endometriosis is variable and can involve organs such as the bladder and rectum that lie within the pouch of Douglas¹¹ (Figure 2) or involving one or both ovaries either superficially or within its depth.

Foci of endometriosis can also be found in distant organs such as the appendix, bowel, diaphragm or pulmonary area. Regarding fertility potential, it is essential to ascertain that the tubes are not involved. If the ovaries are involved, appropriate treatment should be administered to facilitate pregnancy where indicated (Figures 3 and 4). A significant number of patients with endometriosis become pregnant spontaneously and their symptoms characteristically resolve whilst they are no

longer menstruating. This is not to say that they are cured, but their symptoms abate markedly, although there is no evidence to show that pregnancy cures endometriosis.

Patients with endometriosis commonly complain of deep dyspareunia because of the position of the uterus, as endometriosis within the pouch of Douglas commonly causes uterine retroversion and fixation. If endometriosis involves the rectum and lower bowel, patients can complain of painful defecation

and inefficient bowel emptying (Figures 5–8). Endometriosis is a significant problem for women, especially those in the fertile age group where its presence not only causes classic menorrhagia and dysmenorrhea but also sexual problems. In extreme cases, pelvic endometriosis can require bowel resection with bypass or diversion surgery, or, in cases of ureteric involvement, bypass or diverted urinary tract surgery.



Figure 3 Patient aged 32. Surgical marsupialization, irrigation and drainage, followed by goserelin medical treatment. Copyright Mr C. B-Lynch 2009



Figure 5 Patient aged 30. Severe uterine retroversion and retroflexion. Copyright Mr C. B-Lynch 2009



Figure 4 Patient aged 32. Surgical treatment result. Uneventful pregnancy 6 months later with normal delivery. Copyright Mr C. B-Lynch 2009



Figure 6 Patient aged 30. Vaginal manipulation of uterus to test for successful laparoscopic uterine ventrosuspension. Copyright Mr C. B-Lynch 2009



Figure 7 Patient aged 30. Right round ligament lift and fixation. Copyright Mr C. B-Lynch 2009



Figure 8 Patient aged 30. Left round ligament lift and fixation for relief of deep dyspareunia. Uneventful pregnancy and normal delivery following laparoscopic ventrosuspension. Copyright Mr C. B-Lynch 2009

It is important to manage the clinical features of endometriosis and properly investigate these patients, offering medical treatment first. Patients with endometriosis should undergo laparoscopy, at which time lesions can be classified as having pink (early inflammatory changes), chocolate (established) or

white (resolving) characteristics. Patients' symptoms often do not correlate with the laparoscopic severity of endometriosis. Treatment must be individualized taking the entire clinical picture into account. Quality of life and fertility potential are crucial in the management of this condition. When the bowel is involved, it is mandatory that a colorectal surgeon forms part of a multidisciplinary team management (Figures 3 and 4).

Clinical features should be comprehensive. Deep infiltrating nodular lesions are best palpated during menstruation. Transvaginal scan may have a role in the diagnosis of the disease involving the bladder or rectum but is of limited value. Magnetic resonance imaging (MRI) can be superior to ultrasound scan but not of greater benefit compared to laparoscopy. The chemical marker CA125 may be elevated in endometriosis, but its elevation is not always diagnostic of the condition.

Women who want to avoid hormonal therapy to treat their pain should consider NSAIDs. Assisted reproduction should be considered to improve fertility chances in minimal to mild endometriosis. *In vitro* fertilization (IVF) is an appropriate treatment for endometriosis especially when tubal function is compromised.

Laparoscopic ovarian cystectomy is recommended for endometriotic cysts greater than 4cm in diameter. Surgical treatment for endometriomas is often useful before IVF, although women should be counseled regarding the risk of reduced ovarian function after surgery.

Treatment with gonadotropin releasing hormone (GnRH) 3–6 months before IVF in women with endometriosis often increases the rate of clinical pregnancy. Finally, it is worth noting that patient self help groups can provide invaluable counseling support and advice.

PELVIC PAIN

Pelvic pain in women may or may not be associated with significant pathology. Many

women who experience pelvic pain outside the normal menstrual cycle have conditions that may affect their fertility such as PID, adhesions or pelvic cysts. PID in premenopausal women and particularly pre-pregnancy women may result from bacterial infection or STI. The end point is usually described as terminal hydrosalpinges with flimsy pelvic adhesions. The collection of inflammatory material at the resolution stage of gonorrhea and *Chlamydia* infections shows typical tubal distension, distortion, irregularity and thinning of the tubal wall, which may then progress to a chronic inflammatory form. Because hydrosalpinges can contain immune complexes resulting from the resolution process which can affect the IVF success rate, salpingectomy may improve the chance for success in patients who have had tubal disease prior to IVF treatment.

Infected products of conception from a miscarriage may cause proximal damage or occlusion of the tube commonly described as cornual blockage. Such patients have very little or no chance of conceiving even after tubal reconstructive surgery, and IVF remains the key management strategy. Diagnostic procedures (hysteroscopy and laparoscopy) are essential to exclude genital tract abnormality and to ascertain the exact site of chronic PID.

In the vagina itself, about 20% of women may have bacterial colonization, including group B streptococci and sometimes coliform bacteria, which ultimately may affect not only the prospect of IVF success but also pregnancy outcomes. Group B streptococci may cause premature rupture of the membranes and can affect the baby leading to serious neonatal morbidity. When group B streptococci are found colonizing the vagina in pregnancy the protocol of management should be multidisciplinary including a bacteriologist, pediatrician, obstetrician and neonatologist. It is because of the significant consequences of PID that all clinically diagnosed patients should be treated immediately to protect against any progression

of this condition. The choice of antimicrobial or antibacterial therapy will be dependent on the clinical presentation and the need for singular or broad spectrum cover. It is not acceptable to delay medical treatment when PID is suspected or diagnosed.

All mothers should have counseling about the presence of such bacteria in the vagina as soon as the diagnosis is made in pregnancy. PID can cause a significant amount of pain, deep dyspareunia and distortion of the pelvic anatomy.

BENIGN PELVIC CYSTS

The most common cyst in young women of fertile age is the dermoid cyst. Dermoid cysts represent congenital cysts arising from the migration of the ovary from the mesenchymal ridge down to the pelvis assisted by the round ligament to its definitive position on the ovarian fossa. These ovaries may contain cells capable of a variety of tissue differentiation of no ovarian function. The cysts can be found incidentally on ultrasound scan or computed tomography (CT) evaluation. Whenever large cysts are discovered these should be removed by laparoscopy or open surgery as appropriate, as torsion is always possible and can result in destruction of viable ovarian tissue and considerable morbidity.

Dermoid tumors have a very low chance, about 10%, of malignant potential. Careful management of this condition should be discussed with the patient who wants to become pregnant.

Whereas it is acceptable to remove the cyst and conserve the ovary, there is never an absolute indication to remove the ovary because it contains a dermoid cyst. Clinical consideration must be given to the fertility status or preconception state of the patient and general clinical condition before oophorectomy is carried out for a dermoid cyst (Figures 9–12).



Figure 9 Patient aged 19. Presented with 35 cm left dermoid cyst. Laparoscopically deflated and aspirated. Copyright Mr C. B-Lynch 2009



Figure 11 Patient aged 19. Dermoid cystectomy excised and confirmed histologically. Copyright Mr C. B-Lynch 2009



Figure 10 Patient aged 19. Cyst exteriorized and extracorporeal left ovarian cystectomy performed. Copyright Mr C. B-Lynch 2009



Figure 12 Patient aged 19. Replacement of left ovary into pelvis. Copyright Mr C. B-Lynch 2009

BENIGN OVARIAN CYSTS (UNILOCULAR CYSTS)

These conditions exist as benign serous cystadenomas or benign mucinous cystadenomas and are normally diagnosed after cystectomy when no other clinical indication of abnormality is present within the cyst. Preoperative assessment may include the CA125 marker test, which if elevated must be investigated by further high definition scan and other markers.

Although there is a 10% chance of these cysts becoming malignant, the vast majority if properly evaluated require only laparoscopic surgery. It is well recognized that cysts can grow to an enormous size, often in the pre-pregnancy patient, and their excision necessitates skilful laparoscopy or laparotomy.

If all the markers are strongly suggestive of a benign condition, then removing the cyst while conserving ovarian tissue is appropriate and beneficial to the pre-pregnancy patient. To

do nothing is not an option, as it is well recognized that cysts can undergo torsion which would require prompt ovarian cystectomy.

SALPINGIAN CYSTS

These cysts are usually of moderate size and are commonly diagnosed as an incidental finding at routine laparoscopy. If they are tiny, they can be left alone. On the other hand, if they are of a size which might interfere with tubal function by way of torsion, they should be removed laparoscopically, first by deflating the cyst and then resecting the stalk. Occasionally postlaparotomy adhesions may present with loculated cystic formations within adhesion strands or bands which appear as ovarian cysts with the potential to have false imaging and mislead the clinician. Such cysts should be assessed carefully by CT or MRI scanning and interpreted by an interventional radiologist. It is safer to be conservative rather than to proceed to further laparotomy.

It is most essential to evaluate clinical cystic changes thoroughly before surgical intervention, as a proportion of cysts do not originate from a gynecological organ. Occasionally retroperitoneal cysts masquerade as pelvic cysts. Clinicians must always seek the advice of surgical colleagues when the diagnosis is in doubt and in the best interest of the patient.

POLYCYSTIC OVARIAN SYNDROME

Polycystic ovarian syndrome (PCOS) presents problems for the patient as well as her gynecologist. The historical background of this condition goes back to 1845 when Chereau first described the sclerotic changes of the ovaries. Almost a century later, in 1935, Stein and Leventhal¹⁴ described the classical features of PCOS and proposed wedge resection of the ovary as treatment (Figure 13). In subsequent years, our understanding of the

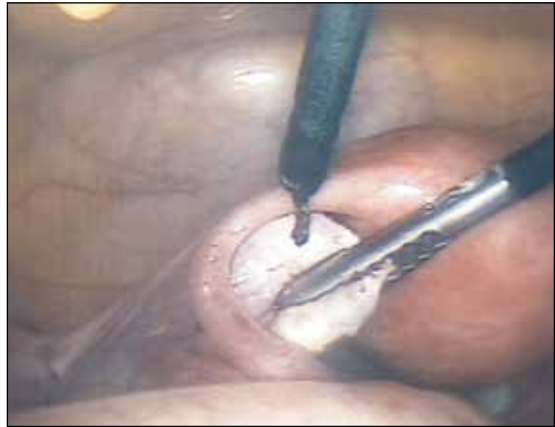


Figure 13 Patient aged 26. Drilling diathermy treatment. Copyright Mr C. B-Lynch 2009

pathophysiological basis of the condition has improved enormously and a variety of treatment options have been suggested with favorable results^{15,16}.

This condition, common among women of reproductive age, has generated much debate regarding its definition and diagnosis. Apart from chronic anovulation and oligomenorrhea, it causes fertility problems for a significant number of women with the diagnosis¹⁷. Normally, two categories of patients having this condition come to attention. On the one hand, there is the patient who presents with oligomenorrhea and is worried about the condition; on the other, there are patients who experience anovulation and are worried about fertility prospects.

In the former category, reassurance is probably all that is necessary. If medical treatment is required, metformin potentiates insulin activity and may correct the condition and facilitate a return of menstruation. Unfortunately, a significant number of these women do not respond to metformin in terms of restoration of ovulation. This medication, backed by clomiphene, may improve the prognosis for pregnancy, but not in all circumstances. Overcoming the insulin resistance by metformin is not the only pathological process warranting treatment to achieve fertility. A body

of evidence shows that insulin resistance is the principle underlying defect and treatment target. Such therapy may not only resolve the immediate clinical problem but also has the potential to reduce the risk of vascular disease in later life¹⁷. Another group of patients have hyperandrogenemia. These patients may also have hirsutism as a problem in addition to their fertility problems. Obesity is a recognized association.

Commonly three approaches are used in the management of PCOS in young women. The first is to treat the symptoms with antiandrogens for conditions such as hirsutism, then to use contraception for menstrual irregularities and finally to institute ovulation induction for the preconceptional patient who is actively seeking pregnancy. Induction of ovulation can be prompted medically or using ovarian diathermy with the laser or wedge resection.

Sinha and B-Lynch demonstrated successful ovulatory responses following the use of the YAG laser in the form of marsupialization of the ovary¹⁶. This technique was further supported by Aziz and B-Lynch with an equally good outcome¹⁸ (Figure 14). These techniques found markedly reduced serum LH concentrations and normal menstrual cycles in 32 (91%)



Figure 14 Patient aged 26. Stromal depth exposure. Histology confirmed polycystic ovary. Uneventful pregnancy and normal delivery 12 months later. Copyright Mr C. B-Lynch 2009

patients with successful ovulation confirmed by day 21 progesterone and 17 pregnancies out of 24 women wishing to get pregnant (71%). Eleven patients were treated for irregular cycles, hirsutism, premenstrual syndrome and/or pelvic pain. There was one miscarriage at 8 weeks, but nine pregnancies resulted in the birth of normal live babies.

The conclusion of this small study was that clinicians should consider this effective laparoscopic surgical technique with ovarian drilling when medical treatment has failed to produce fertility. The paper of Sinha and B-Lynch¹⁶ also showed a reduction in miscarriage rates. Women with PCOS achieving pregnancy might suffer from a short luteal phase for which progesterone therapy might be useful.

It is important to understand that women with PCOS do not all fail to get pregnant spontaneously. The condition can exist in a variety of forms, such as in one ovary but not the other, or in both ovaries. It is because of the bizarre nature of this condition that active management should be encouraged in women who seek to become pregnant and fail with medical treatment as a first line.

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