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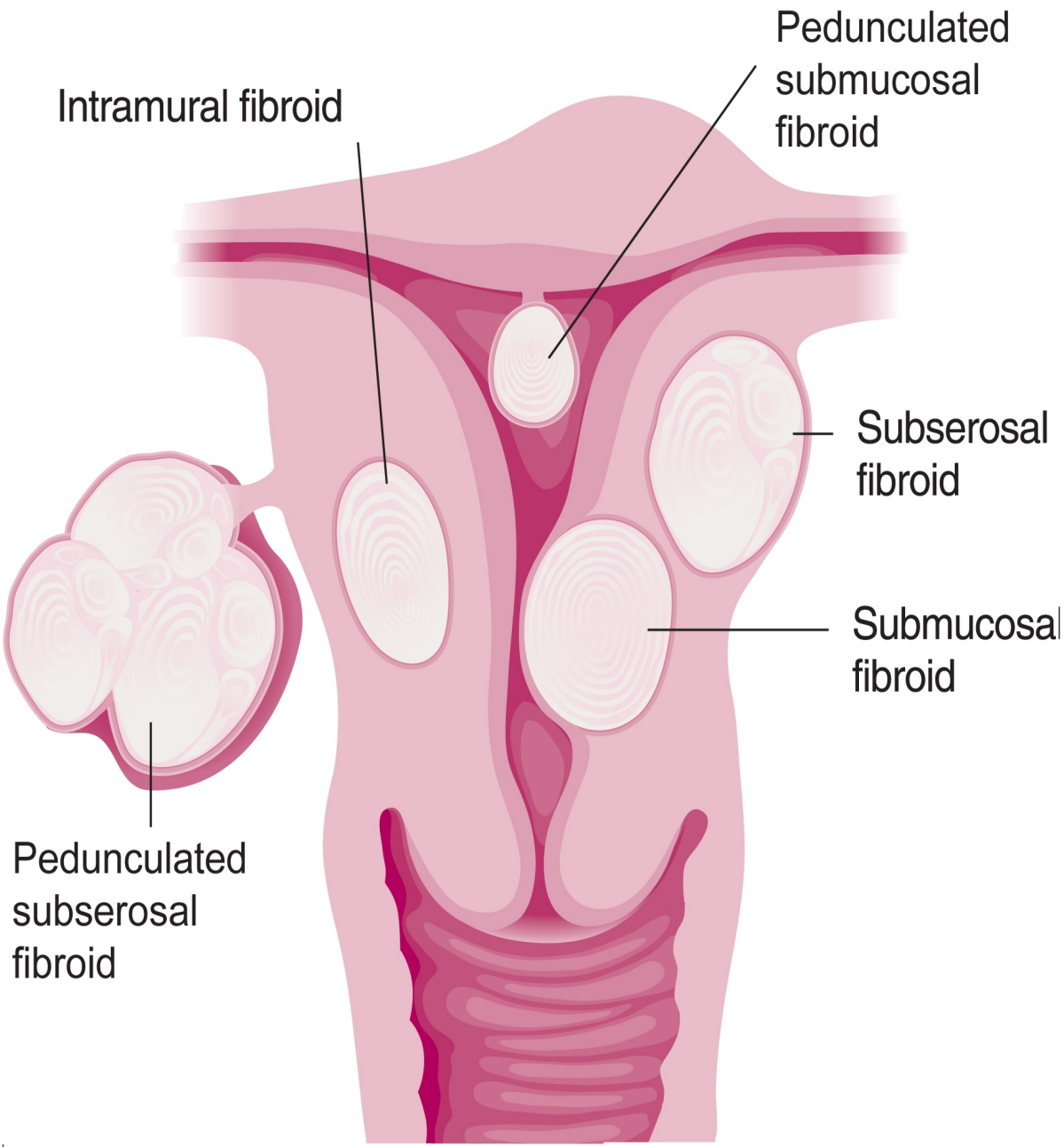

FIBROIDS

Introduction

UTERINE fibroids are common benign tumours present in women of reproductive age. Some women can have debilitating symptoms that significantly affect their quality of life.

In the past, having failed simple medical measures, hysterectomy was often the only treatment option offered.

Over the past two decades, less invasive treatment options, such as progesterone-releasing intrauterine systems (Mirena), endometrial ablation using a variety of energy sources and uterine fibroid embolisation (UFE), have been developed. Techniques in hysteroscopic, laparoscopic and robotic surgery have also advanced. Hysterectomy is no longer necessary in many cases.

In the light of these changes, a new treatment paradigm is required, with a multidisciplinary approach involving GPs, gynaecologists and interventional radiologists. Treatment options should be individually tailored to meet the needs of each woman.

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Pathology

THE estimated cumulative incidence of fibroids by age 50 is nearly 70% for white women and >80% for African American women.[1]

Each fibroid arises from a single cell, triggered most often by a unique chromosomal aberration or specific gene mutation. Each fibroid can develop independently in a woman, and may show a different mutation.[2]

Growth may be promoted by oestrogen and progesterone. One postulated mechanism is that oestrogen facilitates the mitogenic activity of progesterone. Progesterone also acts through genes involved in apoptosis and proliferation.

Fibroids are not found in prepubertal girls, can grow during pregnancy and usually start to shrink post menopause. The use of hormone replacement therapy post menopause can lead to ongoing growth of fibroids.

The location of a fibroid will impact its pathophysiology and clinical presentation (figure 1).

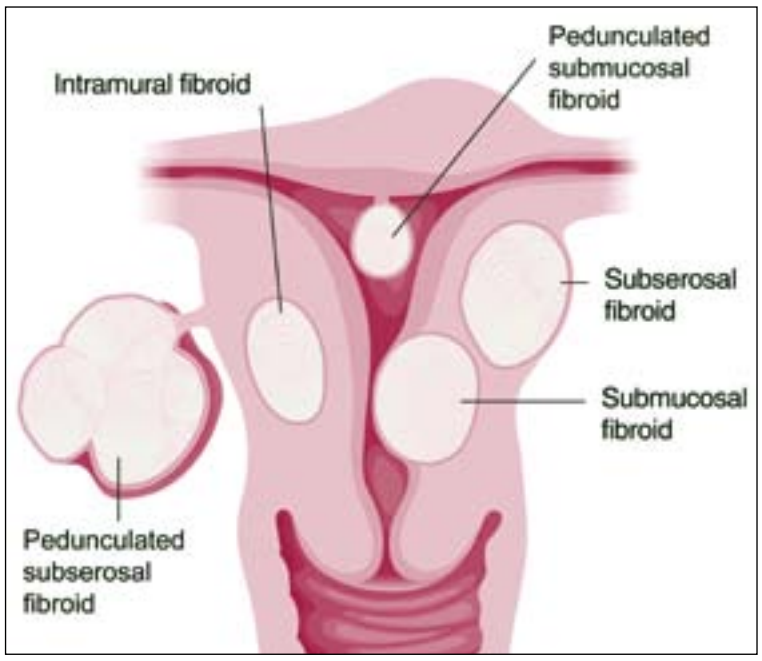

Figure 1. Classification of fibroid by location.

Intracavitary and submucosal fibroids are likely to cause heavy menstrual bleeding, infertility and miscarriage, while intramural and subserosal fibroids are more likely to cause bulk-related symptoms.

Leiomyosarcoma

Many hysterectomies were performed for fear of malignancy. Leiomyosarcoma is very rare, being found in 2-5/1000 hysterectomy specimens.[3] Neither size, imaging appearance, nor growth rate have been shown to predict malignancy. Fewer than 3% have a history of rapid growth.[4] Therefore rapid fibroid growth does not equate to an increased risk of sarcoma.

There are no reliable ultrasound or MRI features of leiomyosarcoma. Leiomyosarcoma arise de novo and malignant change does not arise in benign fibroids. Fear of malignancy should not normally be used to justify hysterectomy, which itself carries a mortality rate of 1.5 per thousand.[5]

Leiomyosarcoma are aggressive tumours that metastasise early, through haematogenous spread. Stage I disease (histologically confined to the organ of origin) carries a 50% five-year survival.

If the disease has spread beyond the uterus, this drops to a 20% five-year survival.

For this reason, laparoscopic morcellation (division into, and removal of, small pieces) has been contraindicated by the US Food and Drug Administration in patients who are peri- or post-menopausal, or those in whom a vaginal or laparotomy approach would afford the opportunity to remove a fibroid in one piece[6].

In an effort to reduce the risk of spreading the cancer through morcellation, some clinicians advocate morcellation in a bag, inside the peritoneal cavity. The FDA is currently assessing this stratagem, and is cautioning patients and surgeons about the consequences of damage to the bag and subsequent spread of malignancy. Open myomectomy and hysterectomy do not carry such risk.

For women treated with uterine fibroid embolisation (UFE), clinical and imaging follow-up is important to pick up unexpected responses, such as persistence of bleeding, pain, failure of a tumour to shrink, and persistence of tumour vascularity indicating viability on MRI. Women with unexpected response and suspicious clinical or MRI features should have the tumour completely removed with hysterectomy. The incidence of sarcoma in UFE series is 0.37%.[7]

Clinical presentation

FIBROID-related symptoms are broadly divided into two types: heavy menstrual bleeding and bulk-related symptoms. Fibroids can also present as fertility and pregnancy-related issues.

Menstrual symptoms

Heavy menstrual bleeding is cyclical, heavy and/or prolonged. The severity can be assessed by symptom review (see box 1). Transvaginal ultrasound may confirm cavity distortion by submucosal or intracavitary fibroids (figures 2a and 2b). However, large intramural and subserosal fibroids may cause local venous congestion resulting in heavy bleeding without cavity distortion.

Heavy menstrual bleeding can be associated with dysmenorrhoea. The presence of severe dysmenorrhoea should raise the suspicion of adenomyosis, which is itself common and often coexists with fibroids. On transvaginal ultrasound, diffuse adenomyosis can be subtle and is often reported as normal. One must resist the temptation to treat adenomyosis with endometrial ablation as this can make dysmenorrhoea worse.

Focal adenomyosis and adenomyomata can masquerade as fibroids. One should avoid resecting these lesions surgically. Unlike fibroids, there is no natural tissue plane between adenomyoma and normal uterine muscle, therefore the lesion cannot be enucleated.

Operative bleeding may be considerable, resulting in unplanned hysterectomy.

If dysmenorrhoea is significant, sonologists should be specifically asked to look for subtle signs of adenomyosis and adenomyoma on ultrasound (see box 2). MRI is more accurate in diagnosing adenomyosis and differentiating an adenomyoma from a fibroid (figure 4).

Intermenstrual bleeding occurs in between periods. Although submucosal fibroids can cause intermenstrual bleeding and spotting, sinister pathologies need to be excluded. Speculum examination and Pap smear are mandatory to exclude cervical pathology. Transvaginal ultrasound and saline infusion sonohystogram may be needed to exclude endometrial polyps (figures 2c and 2d). Endometrial pathology may mandate hysteroscopy and endometrial biopsy.

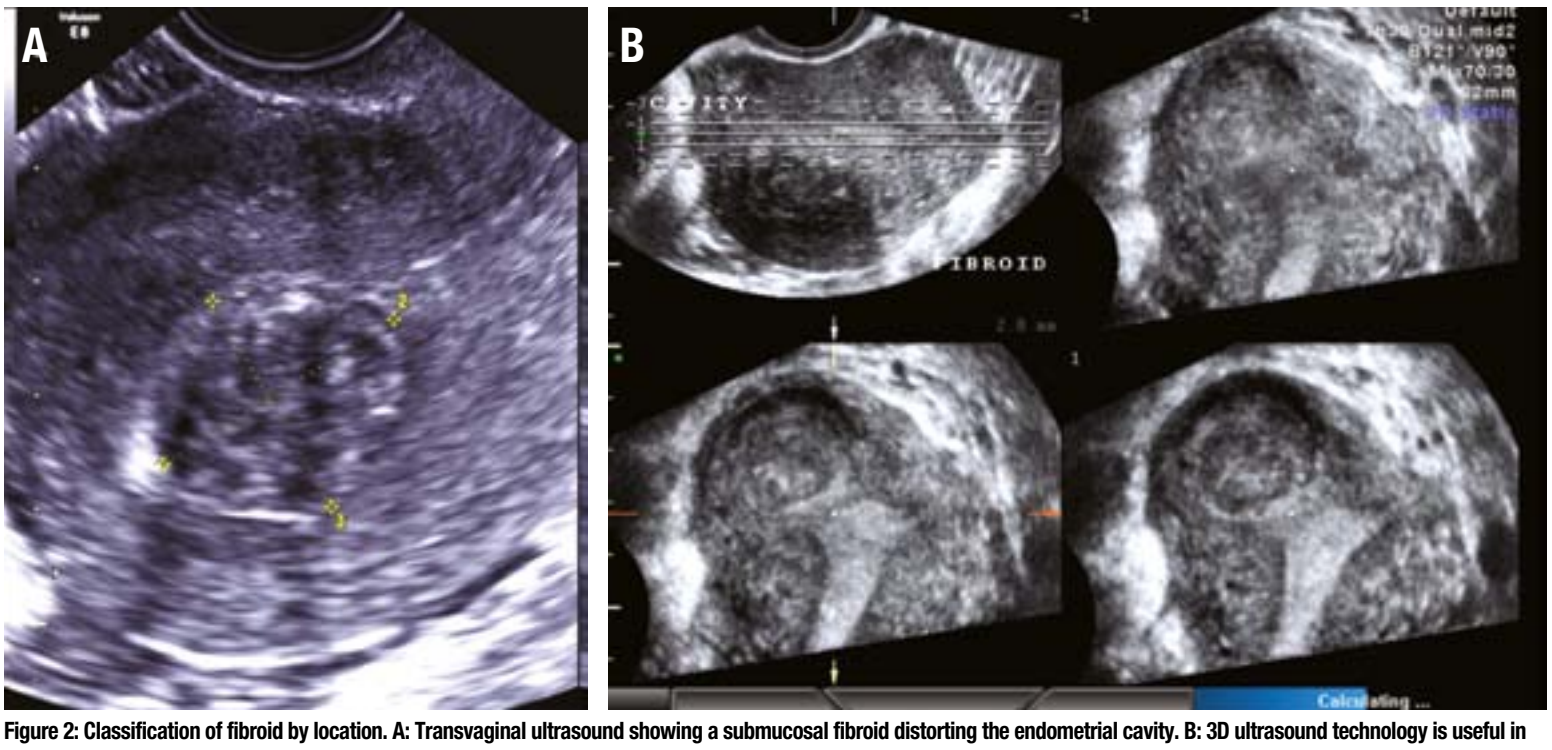

Figure 2 a-d courtesy of Dr Linda Atkins, Sonologist, SAN Ultrasound for Women.

Figure 2: Classification of fibroid by location. A: Transvaginal ultrasound showing a submucosal fibroid distorting the endometrial cavity. B: 3D ultrasound technology is useful in displaying the location of this submucosal fibroid indenting the cornua in the fundal region.

Box 1. Assessing the severity of heavy menstrual bleeding

- What do you use: pad/super pad/ maternity pad; tampon/super tampon?
- How often do you change? Do you have to change overnight?
- Do you have soiled clothing and linen?
- Are you lethargic?
- Are you anaemic or iron-deficient?

Box 2. Sonographic signs of adenomyosis

- Globular-shaped uterus
- Asymmetric uterine wall thickness
- Heterogeneous myometrium
- Myometrial 'venetian blinds' artifacts
- Myometrial cysts

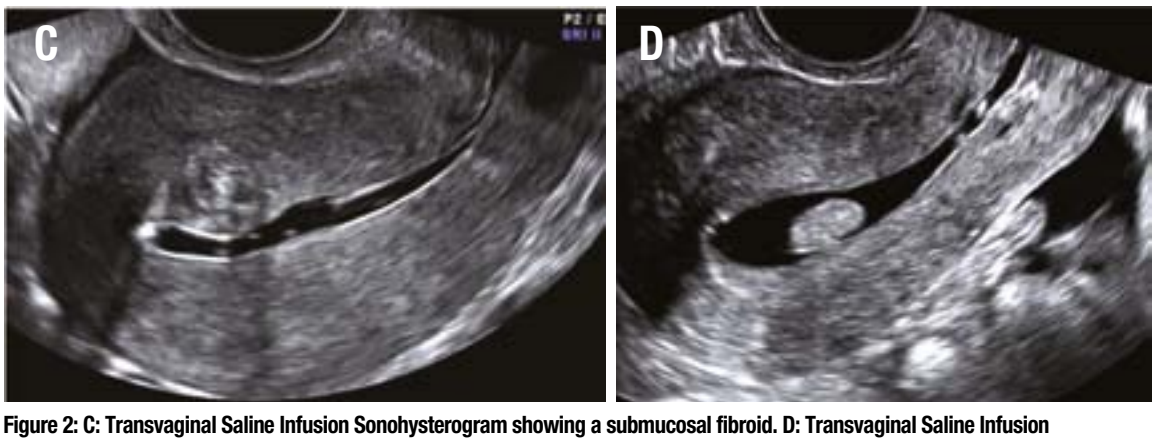

Figure 2 a-d courtesy of Dr Linda Atkins, Sonologist, SAN Ultrasound for Women.

Figure 2: C: Transvaginal Saline Infusion Sonohysterogram showing a submucosal fibroid. D: Transvaginal Saline Infusion Sonohysterogram showing an endometrial polyp.

Bulk-related symptoms

A bulky fibroid uterus can cause bladder symptoms such as frequency, urgency and nocturia. The mass can also cause lower abdominal distention and discomfort. Patients or their partners may be aware of feeling a mass, or a change in abdominal size and contour when wearing fitted garments. Posterior fibroids may be noted on intercourse.

Abdominal palpation and bimanual examination may confirm the

presence of large- and moderate-sized uterine masses, respectively.

Pregnancy should be excluded with beta-HCG and ultrasound.

The presence of fibroids can be confirmed with pelvic ultrasound, which is also useful to exclude other pelvic masses and bladder lesions that might cause bladder symptoms.

Constipation is not a common symptom of fibroids. Constipation and the presence of iron-deficiency anaemia require careful history-taking and physical examination.

Colonoscopy to exclude colonic cancer may be worth considering.

Pain

Although discomfort is a common complaint, pain is not a common feature of fibroids. Acute infarction (red degeneration) of large fibroids, especially during pregnancy, can present as an acute abdomen. Torsion of subserosal pedunculated fibroids can also cause acute pain. Constant pain should lead to the consideration of other pathology.

Fertility and pregnancy issues

As women are having children later in their life, and fibroids grow during reproductive years, fibroids are now a more common issue in fertility and pregnancy.

Submucosal fibroids distorting the endometrial cavity may cause difficulties with conception and may increase the risk of miscarriage (figure 3). Even in the absence of cavity distortion, the effect of a fibroid on endometrial blood supply can have a significant impact on implantation. First trimester bleeding is more common in women with fibroids.

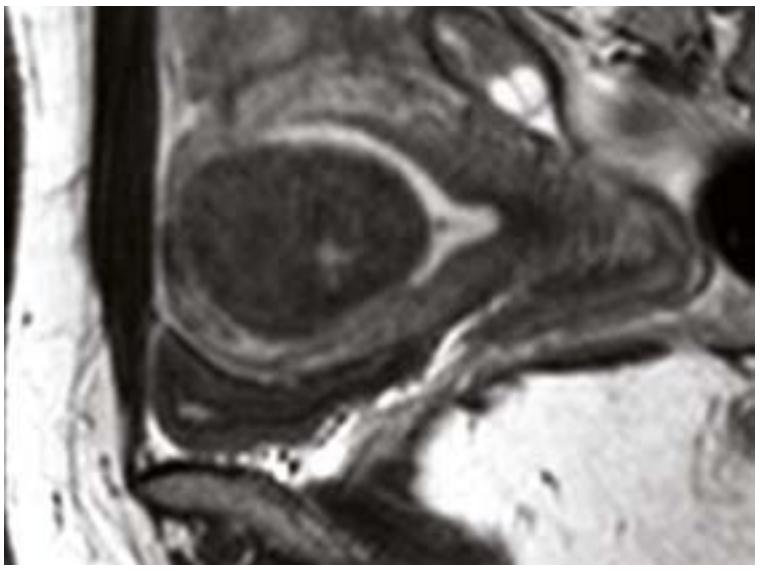

Figure 3. Coronal and sagittal T2 weighted MRIs of a submucosal fibroid protruding into the cavity.

Intramural and subserosal fibroids usually do not cause problems in the absence of cavity distortion. Paradoxically, these are the fibroids most commonly removed as part of myomectomy, being promoted as a procedure to enhance fertility. Fibroids may grow during pregnancy because of a combination of factors, including increased blood flow, high oestrogen levels or high progestogen levels.

Unique to pregnancy, red degeneration (acute infarction) of fibroids can occur. This is typically between weeks 12 and 22, and may be because of insufficient blood supply. This results in acute pain, and can precipitate contractions and — rarely — premature labour.

Fibroids can impact labour, either by their mass obstructing a vaginal birth, or impairing adequate uterine contraction and contributing to post-partum haemorrhage.

The temptation to remove fibroids at caesarean section should be resisted in general, as the bleeding is frequently much greater than anticipated, and fibroids are highly likely to shrink during the puerperium.

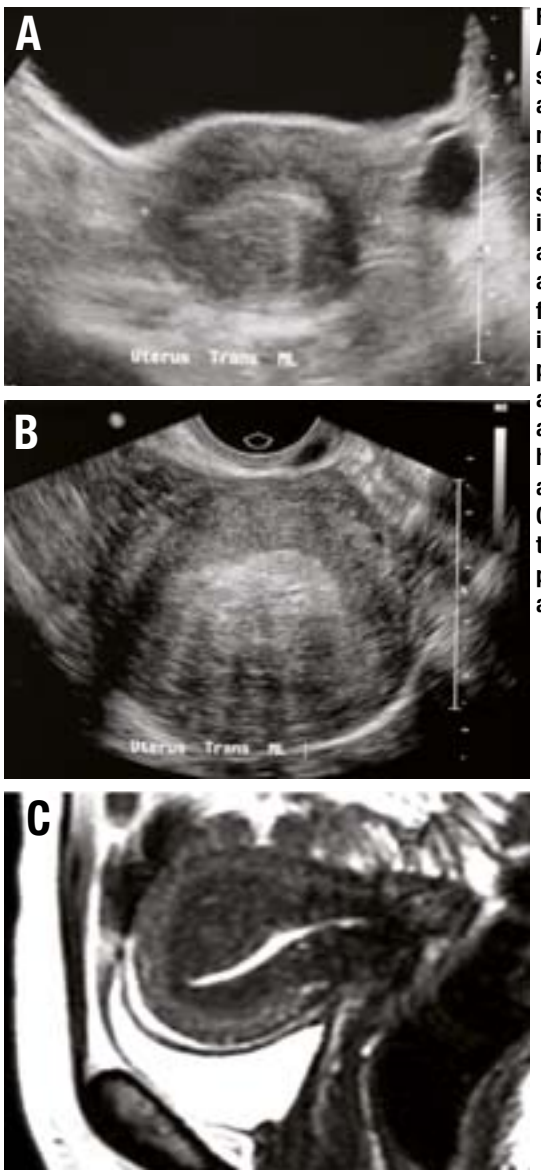

Figure 4:
A: Transabdominal sonography showing asymmetrical myometrial thickness.
B: Transvaginal sonography was incorrectly reported as demonstrating a posterior wall fibroid. In fact, an inhomogenous posterior wall echo and "Venetian blinds" appearance are highly suggestive of adenomyosis.
C: MRI demonstrated typical appearance of posterior wall focal adenomyosis.

Management

FIBROID disease of the uterus is a presumed benign condition that requires treatment only if the symptoms are severe enough to affect the woman's quality of life. Some women have rather large fibroids but remain relatively asymptomatic. In an asymptomatic woman with fibroids, fear of further growth and fear of malignancy should not be construed as reason for invasive procedures such as myomectomy or hysterectomy, or even minimally invasive procedures such as UFE.

Treatments should be targeted at symptom categories: heavy menstrual bleeding, bulk-related symptoms, or both. Medical treatments, Mirena IUD, endometrial ablation and hysteroscopic resection are options for heavy bleeding. Uterine fibroid embolisation, myomectomy, MR-guided focused ultrasound (MRgFUS), and hysterectomy may be used for bulk-related symptoms. Uterine fibroid embolisation and hysterectomy are highly effective for both heavy bleeding and bulk-related symptoms.

Table 1. Indications for the medical treatments of fibroids

	NSAIDs	Tranexamic acid	COCs*	DMPA#	Mirena	GnRH^
Symptoms						
Menorrhagia	-	+	+	+	+	+
Dysmenorrhea	+	-	+	+	+	+
Bulk	-	-	-	-	-	+
Infertility	-	-	-	-	-	+

*COC: Combined oral contraceptive pill. Use with caution. May stimulate fibroid growth.
#DMPA: Depot medroxyprogesterone acetate
^GnRH: short-term use only

Medical treatments

NSAIDs have been shown to be effective in reducing menstrual pain and bleeding in the absence of fibroids. They are not effective in reducing bleeding with fibroids or in reducing their size.[8]

Combined oral contraceptive pills are often used as the first choice in management of heavy menstrual bleeding. There is no evidence that this approach is effective in fibroid-related heavy bleeding.[8]

Research has demonstrated oestrogen- and progesterone-receptor positivity in fibroid cells, and a significantly increased risk of fibroids in women first using the contraceptive pill between the ages of 13 and 16.[9] When COC is trialled for heavy bleeding in the presence of fibroids, growth should be monitored with ultrasound.

Tranexamic acid (Cyklokapron) is an antifibrinolytic that can reduce menorrhagia. It acts by reversibly blocking fibrinogen degradation by lysine. Studies have demonstrated patient satisfaction rates at 80-95%, against end points of menstrual loss being described as either decreased or strongly decreased. A typical dose of either two tablets (1g) four times daily or three tablets (1.5g) three times daily has been shown to be more effective in the treatment of heavy menstrual bleeding than NSAIDs such as mefenamic acid (Ponstan) or luteal phase progestogens (Primolut N).[10]

Side effects include gastrointestinal disturbance and alteration of colour vision. In the event of the latter, the drug should be ceased immediately.

A specific concern with the use of antifibrinolytics is the potential for thromboembolic disease. Tranexamic acid is contraindicated in patients with a history of active thrombotic or embolic disorder.[11] The Cochrane database notes that there is no controlled study assessing the risk of thrombotic disease in patients using tranexamic acid, however, the WHO database records 528 cases of suspected reactions, including DVT, pulmonary embolus, cerebral embolism and arterial thrombosis.

Progesterone antagonists such as RU-486 have been trialled for the treatment of fibroids and show promise.[12] Limiting their utility is the fact that progesterone is important to prevent endometrial overgrowth. Endometrial hyperplasia and heavy bleeding have been seen in users of progesterone antagonists, although at doses below 5mg/day of RU-486, endometrial hyperplasia was not seen and fibroids did shrink. This area is a focus of ongoing research.

Gonadotropin Releasing Hormone (GnRH) agonists, such as goserelin (Zoladex), act at the pituitary by disrupting the normal hypothalamic drive. This results in a drop in gonadotropin levels and thus ovarian suppression. As fibroids are sensitive to levels of oestrogen and progesterone, a fall in these hormones may reduce the size of the uterus and fibroids. Similarly, cessation of normal ovarian cycling can reduce menstrual blood loss due to a reduction in oestrogen drive to the endometrium.

Not surprisingly, symptoms of a lack of oestrogen are very common, with hot flushes, vaginal dryness and mood changes being described in more than 10% of users. Bone pain and hyperglycaemia are also described as common side effects. Longer-term use can lead to osteoporosis.

Fibroids usually regrow rapidly after GnRH agonists are stopped, limiting their use as a long-term treatment. In the short term, they may be useful as a pre-operative treatment to reduce the size of fibroids or allow time to correct anaemia, making them easier or safer to remove surgically.

Mirena

Progesterone-releasing intrauterine systems (Mirena) are highly effective in reducing menstrual loss in the absence of fibroids. They are affordable and have a low incidence of side effects. They require no ongoing effort on the part of the patient for optimal effect. Studies are conflicting whether fibroids are reduced in size or unaffected by the presence of a Mirena device. Blood loss may be significantly reduced, although where a significant submucosal component is present, the device may lead to thinning of the endometrium overlying the fibroid and subsequent bleeding, or bleeding due to friction.[13]

When fibroids are large and distorting the cavity, Mirena may be difficult to insert or remove. Expulsion of the device due to imperfect placement may also prove a concern.

As with most medical treatments, Mirena is a contraceptive, and may not be viewed as a favourable choice by women desiring pregnancy.

Endometrial ablation

Endometrial ablation is a term applied to a family of procedures sharing the common goal of treating menorrhagia by applying an energy source to destroy the lining of the uterus. A variety of energy sources have been used, including electricity, hot water, microwave radiation, laser light and radio frequency array. These procedures are usually performed under general anaesthetic.

Success rates and complications vary according to the method used. Increasingly modern methods of ablation remove the opera-

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tor variant from the process, using computer-driven systems to determine the site, duration and energy level delivered to given portions of the endometrium.

The presence of submucosal fibroids or intramural fibroids can make these methods unreliable. Cavity distortion may prevent or impair exposure to the energy source. As the typical depth of treatment of ablation is around 6mm (sufficient to cauterise the spiral arteries supplying the endometrial lining), a fibroid of greater than this diameter will not be fully treated and so results may vary considerably.

None of these treatments shrink fibroids and as a consequence, bulk-related symptoms are not addressed. Cauterisation of adenomyosis may reduce menstrual flow, however, it is highly likely to significantly worsen dysmenorrhoea. Endometrial ablation is contraindicated for women desiring future pregnancy.

Hysteroscopic resection

Hysteroscopic resection of fibroids is a highly effective method of dealing with smaller fibroids protruding into the endometrial cavity. The technique is performed under general anaesthesia.

Preoperative assessment is essential to clarify which fibroids are suitable for resection. This may include specialist ultrasound, sonohysterogram, MRI or preoperative hysteroscopy. It is important to be sure that it is a fibroid, not an adenomyoma — which cannot be easily enucleated.

Limitations on the extent of resection include the need for an adequate thickness of normal myometrium external to the fibroid. If the normal myometrium outside the fibroid is too thin, the uterus may be perforated, injuring adjacent organs, such as the intestine.

Typically, to be suitable for resection, a fibroid should extend at least 50% of its volume into the endometrial cavity. A fibroid of more that 3-4 cm in diameter may require more than one session to resect completely.

The other limitation of the procedure is the potential fluid overload from absorption of distension fluid. Fibroids are highly vascular and the use of high-pressure non-conducting fluid (glycine solution) for loop resection of fibroids can result in volume overload and hyponatraemia. The use of mechanical systems, such as Myosure, reduces the risk of hyponatraemia by using normal saline as distension medium. Other potential complications include bleeding from the resection site, intrauterine adhesions and infection.

Hysteroscopic resection is highly effective for the treatment of menorrhagia in the short term. However, around 20% of women may be troubled by recurrence of fibroid symptoms due to the growth of new lesions, or by abnormal bleeding. Conception rates are increased following hysteroscopic resection, however, the effect on miscarriage rates is less definite.[14]

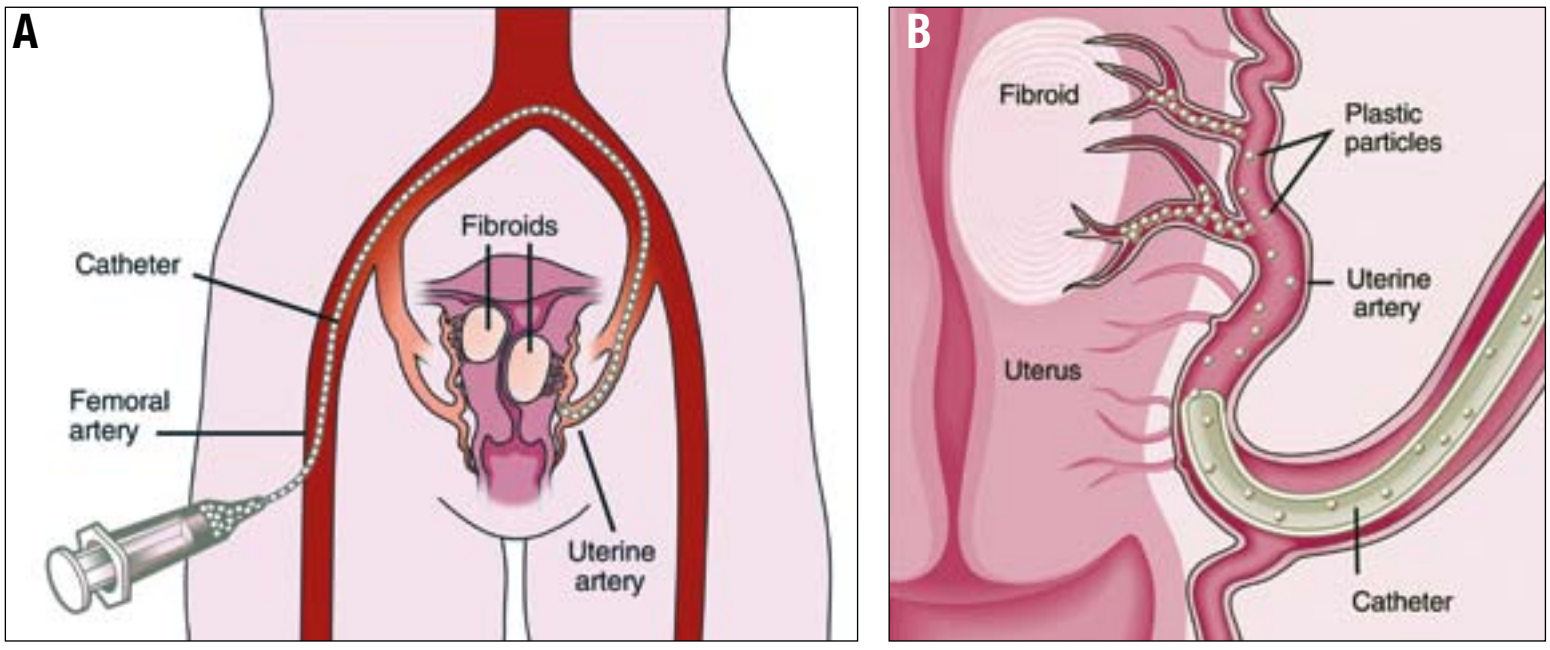

Figure 5: A: UFE: Catheterisation of uterine artery under angiographic guidance. B: UFE: Injection of embolic particles into the uterine artery.

Table 2. Indications for the procedural treatments of fibroids and adenomyosis

Procedure	Hysteroscopic resection	Endometrial ablation	MRgFU	Myomectomy	Uterine fibroid embolisation	Hysterectomy
Symptoms						
Menorrhagia	Yes	Yes	Maybe	Maybe	Yes	Yes
Dysmenorrhea	Maybe	Maybe	Maybe	Maybe	Yes	Yes
Bulk	No	No	Maybe	Yes	Yes	Yes
Conditions						
Large fibroids	No	No	No	Yes	Yes	Yes
Multiple fibroids	No	No	No	Maybe	Yes	Yes
Adenomyosis	No	No	No	No	Yes	Yes
Adenomyoma	No	No	Maybe	No	Yes	Yes
Intracavitary fibroids	Yes	No	No	No	No	Yes
Infertility	Yes	No	Maybe	Maybe	Maybe	No

Table 3. Hysterectomy and UFE comparison

	Uterine fibroid embolisation	Hysterectomy
Nature	Minimally invasive	Major surgery
Where	Angiogram suite	Operating theatre
Anaesthetic	Local	General
Size of incision	0.3cm	15cm
Hospital stay	1-2 nights	4-6 nights
Recovery	1 week	4-6 weeks
Risk of blood transfusion	Nil	2-3%
Acute complication	< 1%	5-10%
Injury to ureter, bladder and bowel	Very unlikely	Possible
Delayed cervical obstruction, endometritis	1-3%	Nil
Effectiveness for fibroid symptoms	90%	100%
Quality of life improvement	Significant	Significant
Imaging follow-up	Yes	No
Future fertility	Possible	No
Socioeconomic cost	Lower	Higher

Myomectomy

Surgical removal of fibroids may be desired for relief of mass-related symptoms or for fertility reasons. In general, fertility is not improved by removal of subserosal fibroids. Current evidence does not unequivocally support the removal of intramural fibroids to assist infertility. Removal of submucosal fibroids may be best treated with hysteroscopic resection.[15]

Myomectomy involves removal of one or more fibroids, and is only feasible for fibroids in suitable locations. Large subserosal fibroids can be removed to ease bulk symptoms. Transmural and submucosal fibroids are usually more difficult to remove. Compared with hysterectomy, myomectomy is technically more demanding for the surgeon, takes longer to perform, and is more likely to require a blood transfusion.

In the event that closure of the myomectomy defect is unsatisfactory, or if bleeding is impossible to control, hysterectomy may be needed. Patients need to be advised of the risk of hysterectomy prior to myomectomy.

Myomectomy may be performed laparoscopically. Fibroids of less than 5cm in diameter can be safely removed. Some surgeons are willing to attempt laparoscopic myomectomy for larger fibroids. More recently, robot-assisted laparoscopic myomectomy has been used. The role of robotic surgery, its advantages, disadvantages and cost-effectiveness are yet to be defined. In Australia, the cost to the patient of consumable instruments and the fee for use of the machine can run into thousands of dollars and are not currently rebated by insurers or by Medicare.

Development of adhesions is a potential side effect in all myomectomies. The use of adhesion barriers and meticulous operative technique can minimise this risk. The presence of a scar in the uterine wall predisposes to uterine rupture. A woman who has undergone a myomectomy should be regarded as a high-risk pregnancy.

Recurrence of fibroids (or, more likely, the growth of the remaining fibroids left behind) occurs in 40-50% of women who undergo myomectomy.

For heavy menstrual bleeding, myomectomy is less effective than hysterectomy and uterine fibroid embolisation.

Uterine fibroid embolisation

When medical treatment and less invasive procedures are ineffective or unsuitable, uterine fibroid embolisation is a non-surgical alternative to hysterectomy. It is minimally invasive, but highly effective in reducing heavy bleeding, shrinking fibroids and relieving period pain. All fibroids present are treated at the same time in a single procedure. Six randomised controlled trials have shown that fibroid embolisation is as effective as hysterectomy.[16]

Uterine fibroid embolisation is also known as uterine artery embolisation. It is an interventional radiology procedure performed under local anaesthetic. With angiographic guidance, the two uterine arteries are sequentially catheterised (figure 5). Embolic particles, such as polyvinyl alcohol (PVA), are injected to block the blood flow to induce ischaemia, leading to infarction, subsequent shrinkage of the fibroid and resolution of symptoms (figure 6).

Uterine fibroid embolisation was first described in 1995. More than 200,000 procedures have been performed worldwide. Following assessment of safety, effectiveness and cost-effectiveness, the Medical Services Advisory Committee recommended Medicare funding in 2006. The American College of Obstetricians and Gynecologists and the Royal Australian and New Zealand College of Obstetricians and Gynaecologists endorsed embolisation as a treatment option in 2008.[17,18]

Uterine fibroid embolisation is essentially as effective as hysterectomy. A Cochrane review concluded there is no difference in quality of life improvement at one year or patient satisfaction rates at two and five years. It is associated with significantly shorter procedural time, hospital stay and time to resume routine activities.[16]

Embolisation has the ability to simultaneously treat all fibroids present in the uterus. It was shown to have a higher success rate in controlling menorrhagia than myomectomy, which has a fibroid recurrence rate of 40-50%.

The size and number of fibroids generally do not matter. Overall uterine volume reduction of 50% and dominant fibroid volume reduction of 60% are expected. This degree of shrinkage is sufficient to achieve clinical satisfaction in 93% of patients.[19]

The procedure is minimally invasive, intrinsically safe and seri-

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ous complications are very rare.[20] The most serious complication is endometritis, with a reported incidence of 2%.[21] This can be managed with prompt administration of antibiotics and transcervical removal of sloughed fibroid if present. Endometritis may be misdiagnosed in many cases, as the markers of successful embolisation — pain, elevated white cell count, raised inflammatory markers and vaginal discharge — mimic the signs of sepsis.

Sloughing of fibroid fragments can be reduced or avoided altogether by careful patient screening to exclude pedunculated submucosal fibroids or those with a significant intracavitary component. The rate of hysterectomy post-procedure ranges from 0.25-1.6%, and is generally attributable to infection, pain, and bleeding.[21]

While the procedure itself is not painful, the recovery can be difficult. It is worse in the first few hours, and is managed with standard analgesia and patient-controlled narcotic analgesia. Low-grade fever, nausea and vomiting, lethargy and minor vaginal discharge are common post-embolisation symptoms.

Amenorrhoea is more likely to be coincidental with natural menopause. Compared with surgery, there is no significant difference in ovarian failure rate at long-term follow-up.[16] Uterine fibroid embolisation does not appear to affect ovarian function in younger women; permanent amenorrhoea tends to occur in older women close to natural menopause.[22]

Pregnancy is possible after an embolisation, but there is an increased rate of miscarriage, postpartum haemorrhage and caesarean delivery. Some studies noted higher rates of preterm delivery, fetal growth restriction, fetal malpresentation and abnormal placentation in candidates with fibroids suited to hysterectomy.[23] An RCT is underway in the UK to compare fertility outcomes between embolisation and myomectomy in women with symptomatic fibroids.[24]

Laparoscopic bilateral uterine artery ligation

This is a procedure that emulates the principle of UFE to induce ischaemia. There are however fundamental differences. Ligation of uterine arteries produces global uterine ischaemia, rather than relatively selective ischaemia to the fibroids as in UFE. The vessel occlusion is proximal rather than at distal branches. Collateralised pelvic vessel will open up and supply the uterus and fibroid. Therefore clinical studies have produced results with much lower success rate than UFE. It is a general anaesthetic procedure and is more invasive.

Hysterectomy

Hysterectomy is clearly required in the treatment of malignant disease of the uterus, but care should be exercised before recommending its use for benign disease. Now that there are many less invasive treatment options to deal with fibroid-related symptoms, hysterectomy should be the last resort when these treatments have failed.

Hysterectomy remains a major surgical procedure that carries a mortality rate of 1.5 per thousand in Australia.[5]

Hysterectomy can be performed transvaginally, transabdominally (open, laparoscopic or robotic). Recovery time varies from 1-6 weeks depending on the type of hysterectomy. Surgical approach depends on the size of the uterus and underlying pathology.

Why should women avoid hysterectomy?

Patients who have had a hysterectomy take longer to recover than those who have undergone other major surgery. Symptoms include urinary problems, tiredness and depression. The underlying cause is uncertain and the condition has been labelled post-hysterectomy syndrome.[25] It was thought to be due to hormone imbalance after hysterectomy.

Hysterectomy weakens the pelvic floor and can cause stress urinary incontinence.[26]

Removal or division of the ligamentous supports of the cervix and upper vagina may predispose to development of prolapse. Further, the effectiveness of prolapse repair is compromised by the removal of the cervix and ligaments used to anchor an effective repair.

Hysterectomy is shown to be associated with earlier onset of menopause. Women who have had hysterectomy enter menopause almost four years earlier compared with similar women who did not have a hysterectomy.[27] Blood supply to the ovary may be interrupted during surgery by ligation, spasms or thrombosis.

Studies regarding the effect on a woman's sex life after hysterectomy may be confusing. Women whose sex lives are affected by their fibroids may find hysterectomy improves this. Meanwhile, women whose sex lives are unaffected should be aware that decreased libido and orgasm intensity have been noted after hysterectomy, especially total hysterectomy.[28] This may be as a result of nerve damage or alterations to the vaginal vault, resulting in altered sensation or loss of uterine contraction, leading to anorgasmia. Constipation following hysterectomy may also be a result of nerve damage.[29]

Magnetic resonance guided focused ultrasound (MRgFU)

This is a minimally invasive alternative fibroid treatment. It uses heat energy generated by focused ultrasound to sequentially destroy a tiny region of tumour at a time. MRI is used to measure the temperature and for anatomic localisation. It is a time-consuming process, requiring the patient to lie prone inside the MRI machine for many hours, depending on the size and number of fibroids to be treated. Long treatment times on the MRI machine means that it can be very costly. There is no Medicare rebate and it is currently only available in Victoria. Only a small percentage of patients are suitable candidates (see box 5). [30,31] The efficacy is far less well documented compared with uterine fibroid embolisation, and 28% of women treated seek alternative treatments for residual or recurrent symptoms by 12 months post- procedure.

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Box 3. Uterine fibroid embolisation in a nutshell

- Non-surgical interventional radiology procedure under local anaesthetic
- Proven to be as effective as hysterectomy
- Size and number of fibroids do not matter
- 1-2 nights in hospital, 1 week recovery
- Post embolisation pain can be managed
- Close to 0% procedural complication
- 1-3% delayed complications such as endometritis and cervical obstruction from sloughed fibroid fragments

Box 4. Potential uterine fibroid embolisation candidates

- Symptomatic women keen to avoid hysterectomy (failed or unsuitable for medical therapy and Mirena)
- Poor surgical candidates for hysterectomy (obesity, previous surgery/adhesion, Jehovah's Witness)
- Women with symptomatic fibroids and perimenopausal symptoms (embolisation allows women to have HRT for menopausal symptoms)
- Women with prolapse (to shrink fibroids prior to pelvic floor reconstruction)
- Adenomyosis and adenomyoma
- Failed, inadequate, or impossible myomectomy to achieve or conserve fertility

Table 4. Long-term adverse effects of hysterectomy

Adverse effect	Possible pathophysiology
Early menopause	Disruption of ovarian blood supply due to ligation, spasm or thrombosis
Prolapse and incontinence	Removal or division of ligamentous support of cervix and vagina
Loss of libido	Unclear
Alteration to the character of orgasm	Lack of orgasmic uterine contraction
Altered sensation for woman and partner	Upper vaginal anatomy change
Constipation	Nerve damage
Post-hysterectomy syndrome	Possibly hormonal changes causing depression and lethargy

Box 5. MRgFU Exclusion criteria

Safety concerns

- Abdominal scars distort ultrasound beam and can cause skin injury and ineffective heating of fibroids
- Fibroids too close to skin can cause skin burns
- Fibroids too close to bone cause overheating and nerve damage
- Fibroids too close to bowel cause thermal injury
- Subserosal fibroids < 3cm in size may cause thermal injury to adjacent tissue, because focal ablation zone is 2.5cm along its beam
- Submucosal fibroids > 3cm may slough off and cause cervical obstruction
- Pedunculated fibroids are mobile and surrounded by bowel which can be injured
- Desiring future pregnancy

Efficacy concerns

- Obesity (>120kg) or fibroids too deep (>12 cm not effective)
- Longer than three hours of treatment time or fibroid larger than 8cm.
- T2 bright/vascular fibroids difficult to heat, may not respond
- Heterogeneous/septated/non-perfused fibroids do not respond well
- Calcified fibroid are difficult to heat up. It may refocus ultrasound and cause thermal injury to non-target organs
- Adenomyosis not effective.

Table 5. MRgFU and uterine fibroid embolisation (UFE) comparison

	MRgFU	UFE
Size and number of fibroids	Limited	Any size and numbers
Desire pregnancy	Maybe suitable	Maybe suitable
Adenomyosis	Not suitable	Effective
T2 bright heterogeneous hypervascular	Less effective	Effective
Calcification	Non-target energy reflection	Not affected
Abdominal scarring	Skin injury	Not affected
Obesity, thick uneven abdominal fat	Less effective	Not affected
Target deeper than 12cm	Not effective	Not affected
Too close to bone	Nerve damage	Not affected
Too close to skin	Skin injury	Not affected

Box 6. Fibroid myths

If it's big, it has to come out.

If it's ugly, it must be nasty.

If it's growing, it must be cancerous.

Truth: Size, imaging appearance, rapid growth do not predict malignancy. Fear of malignancy should not be used as a reason for hysterectomy, as the risk of leiomyosarcoma is similar to the surgical mortality rate of hysterectomy.

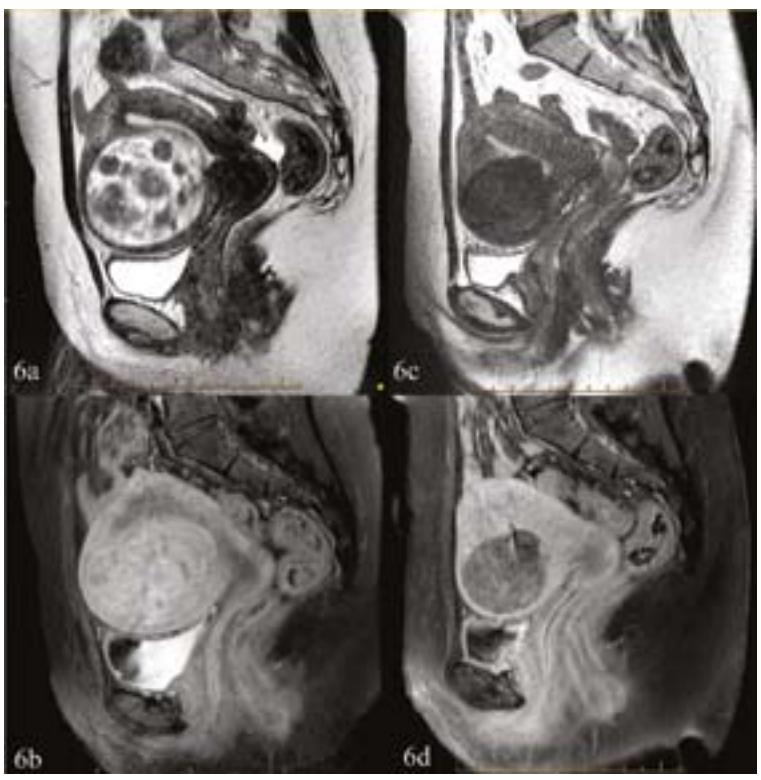


Figure 6 — Pre and Post UFE MRI appearance of fibroid. A: T2W MRI shows a large transmural fibroid slightly distorting the uterine cavity. The fibroid is predominantly high signal suggesting high cellularity. B: Fat saturated contrast enhanced MRI showing high vascularity. C: T2W MRI 6 months post UFE showing reduction in size and loss of signal. D: Fat saturated contrast enhanced MRI showing lack of vascularity, confirming fibroid infarction.

Case studies

Case study 1: Fibroids affecting the whole uterus

Michelle, aged 45, and a para 3, presents with severe menorrhagia requiring her to change her super pad every two hours, dysmenorrhoea, frequency and nocturia. The COC pill had not been helpful. She is not keen on hysterectomy because of the long recovery time. Uterine fibroid embolisation was performed.

At three-months' follow-up, her menorrhagia has resolved and she is using three normal pads a day. She could swim on day two of her menses with a tampon in place. Her frequency was improved and her nocturia resolved.

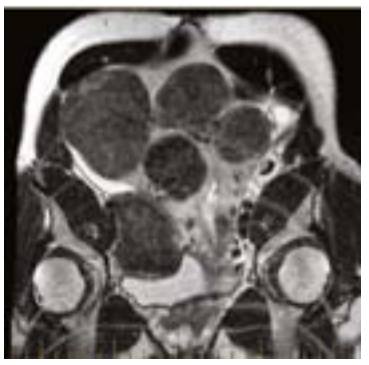
At 24 months' follow-up, Michelle's period remains normal in volume and all her urinary symptoms have resolved.

Mirena might improve menorrhagia and dysmenorrhoea, but will not address bulk issues. Myomectomy is not possible in this case, with essentially the entire uterus replaced with numerous fibroids. Bilateral uterine artery embolisation deals with all fibroids present, no matter how many there might be. Compare the pre- and post-embolisation MRI images and observe the change in size and reduction in signal, and the change in smoothness of the endometrial cavity.

Case study 2: Debulking of multiple subserosal fibroids

BELLE is a 36-year-old African woman. She is referred for the management of abdominal distension due to a large mass arising from her pelvis. The mass had been present for several years. The mass is causing symptoms because of pressure on her bladder and bowel. Dyspareunia is also a problem.

Belle is referred for consideration of hysterectomy, but wishes to retain her uterus as she has not had children. MRI investigation confirms the presence of multiple pedunculated fibroids and no significant submucosal fibroids. After full informed consent about the risks of the procedure, including the possibility of requiring a hysterectomy, she is admitted for laparotomy and myomectomy. Multiple pedunculated subserosal fibroids are removed, of up to 8cm in diameter. Histopathology was benign in all specimens. At post-operative review, her preoperative symptoms have resolved.



This coronal MRI section shows four subserosal fibroids. The endometrial cavity is not distorted.

References, further reading and online resources

Available on request from howtotreat@cirrusmedia.com.au

Summary

FIBROIDS are very common benign tumours in women of reproductive age. Clinical presentation and severity vary widely. Treatment should be tailored to the needs of individual woman. Asymptomatic woman should be reassured and monitored. Size and rate of growth do not predict malignancy. Unusual features such as non-cyclical pain, suspicious imaging features and failure to shrink post uterine fibroid embolisation might indicate possible leiomyosarcoma, which is very rare.

Transvaginal ultrasound is the initial imaging investigation of choice in determining the location of fibroids. MRI is useful for myomectomy and embolisation planning, and is more accurate in differentiating fibroids from adenomyosis/adenomyoma.

For mild to moderate menorrhagia, medical treatment such as tranexamic acid and various forms of progesterone, including Mirena, may be used initially. The use of combined oral contraceptive pills is cautioned, as hormones — especially oestrogen — can stimulate fibroid growth.

Intracavitary fibroids and polyps should be resected hysteroscopically. Endometrial ablation can be used for menorrhagia if the cavity is not too distorted and if adenomyosis has been excluded. Failing simple measures, women with severe menorrhagia and/or bulk-related symptoms should be considered for embolisation as an alternative to hysterectomy. Fibroid embolisation is a minimally invasive procedure performed under local anaesthetic. Compared with hysterectomy, embolisation does not carry the same surgical and anaesthetic risks, and has a faster recovery time. Uterine fibroid embolisation can potentially spare women with fibroids and adenomyosis from hysterectomy.

Myomectomy can be used in selected cases where the tumour deemed to be responsible for symptoms could be safely resected. MR-guided focused ultrasound can only benefit a small number of patients due to its stringent selection criteria and cost.

With the development of various new fibroid treatment options, a multidisciplinary approach is required, involving GPs, gynaecologists and interventional radiologists. Hysterectomy should be the last resort when less invasive options are exhausted.

How to Treat Quiz

Fibroids — 30 October 2015

INSTRUCTIONS

Complete this quiz online and fill in the GP evaluation form to earn 2 CPD or PDP points.
We no longer accept quizzes by post or fax.

The mark required to obtain points is 80%. Please note that some questions have more than one correct answer.

GO ONLINE TO COMPLETE THE QUIZ

www.australiandoctor.com.au/education/how-to-treat

1. Which TWO statements regarding the pathology of fibroids are correct?
a) Uterine fibroids are benign tumours present in 25% of women in their reproductive years.
b) Ethnicity does not affect the risk of developing symptomatic fibroids.
c) Intracavitary and submucosal fibroids are likely to cause heavy menstrual bleeding, infertility and miscarriage, while intramural and subserosal fibroids are more likely to be responsible for bulk-related symptoms.
d) Menopause generally has no impact on fibroids.

2. Which THREE statements regarding leiomyosarcoma are correct?
a) Leiomyosarcoma is very rare.
b) Leiomyosarcomas occur following malignant change in fibroids.
c) Neither size, imaging appearance, nor growth rate have been shown to predict malignancy.
d) Leiomysarcomata are aggressive tumours that metastasise early, through haematogenous spread.

3. Which TWO of the following are presentations of fibroid related symptoms?
a) Heavy menstrual bleeding and bulk-related symptoms.
b) Presyncope and syncope.
c) Fertility and pregnancy-related issues.
d) Hiccups

4. Which THREE statements concerning bulk-related symptoms are correct?
a) A bulky fibroid uterus can cause bladder symptoms such as frequency, urgency and nocturia, as well as lower abdominal distention and discomfort.
b) Posterior fibroids may be noted on intercourse.
c) Constipation is a common presenting feature of posterior fibroids.
d) Patients or their partners may be aware of feeling a mass, or a change in abdominal size and contour when wearing fitted garments.

5. Which TWO statements regarding fibroids, and fertility and pregnancy are correct?
a) Subserosal fibroids distorting the endometrial cavity may cause difficulties with conception and may increase the risk of miscarriage.
b) Fibroids may grow during pregnancy because of a combination of factors, including increased blood flow, high oestrogen levels, or high progestogen levels.
c) Unique to pregnancy, red degeneration of fibroids can occur.
d) Third trimester bleeding is more common in women with fibroids.

6. Which THREE treatment modalities are appropriate for heavy menstrual bleeding?
a) Mirena IUD
b) Magnetic-Resonance guided focused ultrasound
c) Endometrial ablation
d) Hysteroscopic resection

7. Which TWO statements regarding the medical management of fibroids are correct?
a) COCP has been used for heavy menstrual bleeding but oestrogen might stimulate fibroid growth
b) NSAIDs are effective in reducing heavy menstrual bleeding due to fibroids.
c) Tranexamic acid is contraindicated in patients with a history of active thrombotic or embolic disorders.
d) Gonadotropin-releasing hormone can be used as a long-term treatment for fibroids

8. Which THREE statements regarding the procedural management of fibroids are correct?
a) Endometrial ablation will shrink fibroids, thus relieving bulk-related symptoms.
b) Hysteroscopic resection of fibroids is a highly effective method of dealing with smaller fibroids protruding into the endometrial cavity.
c) Current evidence does not unequivocally support the removal of intramural fibroids to assist infertility.
d) When medical treatment and less invasive procedures are ineffective or unsuitable, uterine artery embolisation is a non-surgical alternative to hysterectomy.

9. Which TWO statements regarding the procedural management of fibroids are correct?
a) Uterine fibroid embolisation has proven to be as effective as hysterectomy.
b) Laparoscopic ligation of uterine arteries is not as effective as uterine fibroid embolisation.
c) With modern surgical techniques, hysterectomy is no longer regarded as a major procedure.
d) Hysterectomy and non-surgical means of treating fibroids have similar risk profiles.

10. Which THREE statements regarding hysterectomy are correct?
a) Hysterectomy weakens the pelvic floor and can cause stress urinary incontinence.
b) Even without oophorectomy, hysterectomy might bring forward menopause by four years.
c) Hysterectomy should be the treatment of choice for heavy menstrual bleeding and bulk symptoms due to fibroids.
d) Hysterectomy might cause sexual dysfunction.

CPD QUIZ UPDATE

The RACGP requires that a brief GP evaluation form be completed with every quiz to obtain category 2 CPD or PDP points for the 2014-16 triennium. You can complete this online along with the quiz at **www.australiandoctor.com.au.** Because this is a requirement, we are no longer able to accept the quiz by post or fax. However, we have included the quiz questions here for those who like to prepare the answers before completing the quiz online.

Australian Doctor Education

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NEXT WEEK

Next week's How to Treat outlines the investigations in patients where a secondary cause of hypertension is suspected. The authors are **Dr Surjit Tarafdar**, Blacktown Hospital, Sydney, and conjoint lecturer, University of Western Sydney, NSW; **Professor Jonathan Gleadle**, Flinders Medical Centre and Flinders University, SA; **Dr Wayne Rankin**, Royal Adelaide Hospital, Adelaide, SA; **Dr Yena Hye**, Blacktown Hospital, NSW; and **Dr Ahamed Zawab**, Blacktown Mount Druitt Hospital and University of Western Sydney, NSW.