

Improving assessment and management of fecal incontinence in women

By Summer A. Hinthorne, DNP, WHNP-BC

In this article, the author discusses risk factors for and symptoms of fecal incontinence, initial assessment, conservative treatments, and indications for referral. Ultimately, the goal of this article is to help providers better assess and manage fecal incontinence and improve quality of life for women.

KEY WORDS: fecal incontinence, anorectal examination, anal sphincter, pelvic floor

Fecal incontinence (FI), defined as the involuntary leakage of gas, fluid, or solid stool occurring for at least a month's duration, affects nearly 13 million women in the United States.¹⁻³ FI itself is not defined as a disease but rather as a symptom of an underlying disorder.² Potential causes include neurologic diseases (focal brain defects secondary to stroke, tumor, trauma, multiple sclerosis), anal sphincter injury/trauma, inflammatory bowel disease, fecal impaction, rectal neoplasms, decreased pelvic floor muscle strength, and pelvic organ or rectal prolapse, although sometimes the cause may remain unknown.^{4,5} Although FI affects a significant number of women, this topic is generally not discussed openly in society.² Many women manage their symptoms privately rather than discussing them with a healthcare provider (HCP) because of embarrassment and shame.^{3,5}

FI may have social, emotional, psychological, and physical impacts with a significant effect on quality of life. It is associated with social isolation and depression.^{1,6} Work and daily life may need to be arranged



around access to a bathroom. FI prevalence increases with age and is a contributing factor to admission to long-term healthcare facilities for older individuals.⁶

Underreporting of symptoms results in unnecessary suffering by women experiencing FI.⁶ Treatments are available that may effectively resolve symptoms or at least decrease frequency and amount of leakage to positively impact quality of life.^{5,6} HCPs in primary care settings should be aware of risk factors for FI, ask women about symptoms, provide an initial evaluation, initiate conservative treatments, and make referrals as appropriate. Risk factors for fecal incontinence are listed in *Box 1*.^{2,3,5,7}

Assessment

Health history

A comprehensive health history is critical in confirming the diagnosis of FI, identifying potential causes, and determining the impact on quality of life.¹⁻³ A detailed history of FI includes baseline bowel pattern, onset of symptoms, frequency, urgency, amount and consistency of leakage, any noted blood in stool, aggravating factors, and triggers.³ Past treatments as well as current day-to-day management of the condition should be reviewed.^{2,3} The health history should also include medical conditions, surgeries, obstetric injuries, other pelvic floor/anorectal trauma or injury, physical mobility limitations, current medications, and any associated symptoms (eg, gastrointestinal, urinary, gynecologic, sexual, neurologic).^{2,3,5} An assessment of the effect of FI on the patient's quality of life includes asking about changes in daily activities made in response to symptoms as well as screening for depression and anxiety.²⁻⁷

Physical examination

Physical examination for a patient

Box 1. Risk factors for fecal incontinence^{2,3,5,7}

- Increasing age
- History of anorectal procedures
- Chronic diarrhea
- Irritable bowel syndrome
- Inflammatory bowel disease
- Obesity
- Diabetes
- Cognitive impairment
- Impaired mobility
- Urinary incontinence
- Complicated or operative vaginal birth
- History of pelvic irradiation
- Anal intercourse

Box 2. Red flags indicating need for evaluation for colorectal cancer⁵

- Unexplained weight loss
- Abdominal pain
- Rectal bleeding
- Melena
- Anemia
- Change in bowel habits including diarrhea or constipation
- Change in caliber of stool (pencil thin stools)

experiencing FI includes a pelvic examination with assessment for pelvic organ prolapse and pelvic muscle strength. The anorectal examination includes inspection of the perianal skin for irritation or fecal matter and the rectal opening for any gaping, prolapse, or external fistula. Perianal sensation should be assessed by lightly stroking the skin immediately surrounding the anus, which should elicit a reflexive contraction.⁵ A digital rectal examination is included to assess anal sphincter tone (resting pressure versus squeezing pressure) and to rule out any palpable rectal masses or stool impaction.^{2,3}

Laboratory and diagnostic tests

Blood and stool testing may be relevant to rule out any suspected infection.^{2,3} Anal manometry can be utilized to accurately assess sphincter muscle resting tone, squeeze pressures, and rectal sensation.² An internal sphincter defect can be detected when low resting pressures are noted, while an external sphinc-

ter defect is diagnosed with low squeeze pressures.² Referral for further diagnostic testing is indicated if an anatomic dysfunction and/or a defect is noted or if findings are inconclusive. Tests may include anorectal ultrasound, pelvic magnetic resonance imaging, and colonoscopy. Red flags indicating a need for an evaluation for colorectal cancer are listed in *Box 2*.⁵

Management

Generally, conservative therapeutic options are appropriate as first-line treatment of FI.^{2,3,7} Nonsurgical options have demonstrated at least short-term efficacy with minimal risk and few if any adverse effects.⁵ Many of these interventions can provide improvement in incontinence and give patients a sense of control. A combination of nonsurgical therapies is often most effective.¹⁻⁴ Surgical options may be considered following failure of nonsurgical therapies or when the patient has an anatomic defect such as a fistula or rectal prolapse.^{4,5}

The use of a food/symptom diary

Box 3. 2015–2020 US Department of Agriculture dietary guidelines for fiber¹¹

- 19–30 years—28 g of fiber daily
- 31–50 years—25.2 g of fiber daily
- 51 years and older—22.4 g of fiber daily

can help the patient identify what foods to avoid that may trigger loose stools or urgency. Common trigger foods include dairy products, spicy foods, caffeine, alcohol, and greasy or fatty foods.⁸

Dietary and supplementary fiber can help to normalize stool consistency.⁹ A randomized controlled trial showed that adding 16 g of fiber daily resulted in a significant decrease in the episodes of fecal incontinence by 51% in an exposure group compared to 11% in a placebo group.¹⁰ To avoid unpleasant gastrointestinal effects (ie, bloating, flatus, cramping), it is recommended to increase fiber slowly by about 5 g every 1 to 2 weeks.⁵ See Box 3 for dietary fiber guidelines.¹¹

Bowel habit training techniques can help develop consistent regularity, while setting a schedule to have a bowel movement. Setting regular times to have a bowel movement can improve rectal emptying and thus decrease episodes of fecal incontinence.¹²

When FI is associated with diarrhea or loose stools, medications that slow intestinal motility may be helpful. Antidiarrheal medications such as loperamide and diphenoxylate with atropine may also increase internal anal sphincter tone.^{4,5} Loperamide can be titrated up to 4 mg twice or 3 times daily with a maximum dosage of 16 mg/day. Antidiarrheal medications can lead to constipation and therefore education should be provided to patient to notify provider if

they experience straining with bowel movement or hard stools. The patient can titrate their dose to prevent FI while not causing constipation.⁵ Patients with overflow FI associated with constipation or fecal impaction may benefit from the use of osmotic laxatives.⁵

Anal plug and vaginal bowel control devices are also available. Although anal plug devices are reported to cause adverse effects such as rectal urgency, irritation, pain, and soreness, they can be effective for individuals who are able to tolerate their use.^{5,14} The vaginal bowel device is placed in the vagina and a balloon is inflated to occlude the rectum. The balloon must be deflated for voluntary bowel movements.¹⁵ This treatment has been successful in patients who do not have primarily watery fecal incontinence. Reported adverse effects include cramping, urinary symptoms, pelvic pain, and vaginal spotting.¹⁵

Pelvic floor physical therapy can help strengthen and better coordinate the anal sphincter and pelvic floor muscles. The evidence that this therapy is any more effective than other conservative treatments is insufficient, but studies have demonstrated an improvement in symptoms without adverse effects.⁵ The addition of biofeedback may improve the ability to isolate and contract the external sphincter muscle.^{5,13}

Fecal incontinence often leads to perianal skin breakdown, resulting in rash and irritation. Perianal skin care with gentle soaps and wipes and zinc oxide-based protective ointments can decrease irritation from fecal material. Disposable absorbent pads and pull-ups may be helpful.⁴

Sphincter bulking agents may be effective in decreasing mild FI for up to 6 months after injection. Biocompatible tissue-bulking agents are injected into the anal canal walls.¹⁶ Data

regarding the long-term effects of sphincter bulking agents are lacking.

Finally, surgical treatment is indicated for repair of anatomic defects such as fistulas, rectal prolapse, and anal sphincter disruption.^{2–5} Surgical treatment may also be considered for patients who have failed non-surgical treatment options. These patients should be referred to a urogynecologist or another surgeon specializing in colorectal disease.⁵

Conclusion

Healthcare providers in primary care settings have an opportunity to improve quality of life for women with FI through screening, assessment, initiation of conservative interventions, and referrals when appropriate. Women may not bring up their symptoms because of shame and embarrassment. When the HCP asks about continence status routinely, especially for women with risk factors, patients benefit. Conservative treatments can help women with FI feel in control of their symptoms and allow them to continue normal activities that can reduce the risks for social isolation and depression. Improving both assessment and management of FI can ultimately improve overall quality of life for women experiencing these symptoms. ●

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Initial evaluation of the male with infertility

By Randee L. Masciola, DNP, APRN-CNP, WHNP-BC, and Justin M. Waryold, DNP, RN, ANP-C, ACNP-BC, GS-C, CNE

MJ, a 31-year-old Hispanic man, presents to the family planning clinic with his wife of 4 years, concerned because they have been trying to conceive for the last 16 months without any success. His wife had her annual well-woman exam with a nurse practitioner (NP) at the clinic 4 months ago. Her physical examination was normal, and she is in good health with regular menses and positive monthly ovulation detection with over-the-counter kits. MJ, on the other hand, has not seen a provider for any examination for at least 5 years.

MJ describes occasionally feeling a small lump on his left testicle accompanied by intermittent pain described as a dull ache for the “last few years” with occasional sharp fleeting pain about once a month. He says he has never fathered a child and is worried that he might have a problem that is preventing him and his wife from being able to get pregnant.

Because MJ’s wife was comfortable with the NP that she saw for her annual well-woman visit, they ask to see her. This NP is a women’s health nurse practitioner (WHNP). Will this

WHNP be able to see a male patient for this concern? It is a common misconception that WHNPs only care for the sexual and reproductive health (SRH) care needs of women. In the 2018 Women’s Health Nurse Practitioner Workforce Demographics and Compensation Survey, 24% of respondents reported caring for the SRH needs of men.¹ A recent Nurse Practitioner in Women’s Health (NPWH) position statement affirms the role of WHNPs in the evaluation and management of common SRH problems in men.² The NPWH WHNP guidelines for practice and education outline specific male SRH competencies and curriculum content.³ Finally, the national certifying body of WHNPs, the National Certification Corporation, has included questions and content on male SRH for over 2 decades. Thus, the WHNP is qualified to see men for initial evaluation of fertility and testicular mass or pain.

Health history

The health history is conducted in a private room, while the patient is fully clothed to facilitate a comfortable environment. For concerns regarding fertility and/or testicular lump or pain, components of a focused health history include medical conditions, surgeries, medications, environmental and occupational go-



Box 1. Focused history topics⁴

- Medical history: childhood illnesses, diabetes, cancer, hypertension, mental health
- Surgical history: surgery or trauma to the pelvic area
- Medication reconciliation: including supplements, over-the-counter treatments, as well as any allergies
- Review of systems: genitourinary (dysuria or pelvic pain), lymphatics (pelvic lymph nodes), gastrointestinal, muscular, endocrine, and psychiatric (depression or anxiety) to rule out other differential diagnoses

Table 1. Differential diagnosis for scrotal mass

| Differential cause | Subjective findings | Objective findings |
|---|--|---|
| Varicocele | Feeling of fullness usually of left testicle +/- dull to sharp pain without radiation | Nontender, soft scrotal mass separate from testicle with dilated veins ("Bag of worms"); may be more readily palpable when patient is standing and performs the Valsalva maneuver; often not palpable when in supine position |
| Hydrocele | Feeling of fullness in scrotum, not painful | Nontender fluid-filled scrotal mass; examining fingers can get above mass within scrotum, transilluminates |
| Scrotal hernia/indirect inguinal hernia | Swelling in scrotum when standing and with bearing down, usually not painful unless strangulated | Nontender scrotal mass; palpable when patient is standing and performs Valsalva maneuver; often not palpable when in supine position, examining fingers cannot get above mass within scrotum, does not transilluminate |
| Spermatocele/epididymal cyst | Painless nodule above testis | Soft, nontender, mobile round mass in the head of the epididymis (just above the testis); transilluminates |
| Testicular cancer | Painless nodule; in advanced cases, testicle may feel heavier than normal. | Firm, nontender, nonmobile nodule; does not transilluminate. In advanced cases, pelvic lymphadenopathy may be present. |

nadotoxic exposures including heat, and a review of systems to provide direction in developing a differential diagnosis. Topics to include in this first part of the health history are provided in *Box 1*.⁴ Prior to completing the substance use, sexual, and reproductive portions of the health history, the clinician should let the patient know that some of the questions asked may seem of a personal nature. Explaining that this information is essential to determine the cause of testicular pain and factors that may be affecting fertility fosters open

communication. A nonjudgmental approach is critical. The substance use assessment includes smoking, vaping, alcohol, recreational drugs, and any prescription medications used for other than medically intended purposes (eg, opioids, anabolic steroids, testosterone). The sexual and reproductive history includes sexual practices, partners, history of sexually transmitted infections, libido, ability to have and maintain an erection, ability to ejaculate, any pain during sex, and family history of infertility.

MJ has no significant medical or

surgical history and takes no medications. He works as an accountant and plays baseball on the weekend with friends. He has no known toxic exposures. MJ does not smoke, vape, or use recreational drugs. He drinks 2 to 3 beers on the weekends. He and his wife have vaginal and oral sex once or twice each week. He does not have problems with arousal, erection, or ejaculation. MJ states he did have gonorrhea when he was about age 23 years that was treated without any complications. There is no known family history of infertility of which he is aware.

MJ expresses having a fullness of the left testicle, which sometimes is accompanied by pain that ranges from dull to sharp without radiation. He expresses that occasionally he has an intermittent feeling of a sudden "flick" or sharp pain to the testicle lasting only a few seconds. He states these symptoms are exacerbated with prolonged standing and when he bears down. Prior to the last few years, he states he has never had any issues with his testicle, including during adolescence. He denies any symptoms with the right testicle.

Physical examination

Blood pressure and height and weight for body mass index should be assessed. If indicated by patient age or health history, other physical examination components may be included. The patient is provided with a drape to cover the groin area and can keep his underwear on until this portion of the examination begins. The clinician explains to the patient that the examination will include inspection and palpation of the penis, urethral opening, scrotum, and testicles. If the patient is anxious, providing instruction on slow, deep breathing will assist in relaxation. The patient usually stands for the examination

of the genitals and groin with the clinician seated on a chair or stool. The male genital exam includes the following⁴:

- Inspection of the penis noting location of the urethral meatus and any discharge or skin changes
- Inspection and palpation of scrotum and both testes; noting size, any nodules, and tenderness, as well as presence and consistency of vas deferens and epididymis
- Palpation of inguinal lymph nodes for enlargement and/or tenderness

The scrotal exam begins with an inspection of the skin and scrotal contours for visible swelling, masses, or veins. The testis, epididymis, and spermatic cord on each side are palpated starting at the superior posterior surface of the testis and progressing downward. Pressure on the testes normally produces some discomfort. Assessment for a scrotal mass includes asking the patient to bear down (Valsalva maneuver) while standing. Any scrotal mass should be assessed with the patient in both standing and supine positions. See *Table 1*.

Varicocele and male infertility

The WHNP noted a nontender soft mass (sometimes described as feeling like a bag of worms) in the left scrotal area separate from the testicle when MJ was standing and performed the Valsalva maneuver. The mass disappeared when MJ changed to a supine position. These examination findings are consistent with varicocele. Varicoceles found on physical examination are graded as grade 3 when visible on inspection, grade 2 when felt with easy palpation, and grade 1 when only palpable with Valsalva maneuver.⁵ Significantly, only palpable varicoceles have been associated with infertility.⁶ There were no other

The exact pathophysiology of the varicocele in infertility is unknown. Some possible causes could be related to elevated temperature, venous stasis and reflux, and low intratesticular testosterone.

abnormal examination findings.

A varicocele is an abnormal dilation of the spermatic veins. It is commonly due to the abnormal dilation of the pampiniform plexus (approximately 10 veins draining the testis and epididymis), surrounds the testicular artery in the spermatic cord, and lies anterior to the ductus deferens. Varicoceles affect 15% of the general male population.⁶ They often initially manifest in adolescent males and increase in size and symptoms with age, but they frequently are not discovered until the patient has a workup for infertility or unmanageable pain. Varicoceles can impair sperm production and function, resulting in infertility. Studies have shown that as many as 41% of all males who experience primary infertility have a varicocele, along with up to 81% of males who are seeking care for secondary infertility or infertility after one has conceived prior.^{7,8} The exact pathophysiology of the varicocele in infertility is unknown. Some possible causes, however, could be related to elevated temperature, venous stasis and reflux, and low intratesticular testosterone.⁹ Other causes of male infertility should be included in the evaluation. Common causes for male infertility are listed in *Box 2*.¹⁰

Diagnostic testing

Not all individuals with a varicocele have inadequate sperm; therefore, to determine the extent that MJ's varicocele is the root cause of infertility, the patient should have a semen analysis. *Table 2* lists normal semen analysis findings.¹¹ Prior to the analysis, the patient must remain abstinent for at least 2 days. The specimen is usually obtained by masturbation and collecting all contents into a specimen cup provided by the clinic. Due to the sensitive timing, it is highly recommended that this occurs within an environment that has an andrology laboratory available on site. It can also be done at home, but the specimen must be kept warm and taken to the lab within 1 hour of collection. The patient should be instructed that the typical ejaculation volume is 1.5 mL, so it is not expected to fill the cup. MJ's semen analysis results included a low volume with normal motility and normal forms. An abnormal semen analysis requires repeat specimen collection about 4 to 6 weeks after the initial analyses related to highly established inner variability of male sperm production. MJ's repeat semen analysis produced the same results as the initial test.

Since MJ is also having pain, im-

Box 2. Common causes of male infertility¹⁰

- Low sperm count and/or poor sperm quality
- Congenital abnormalities
- Hormone imbalance
- Genetic deficits
- History of cardiac, renal, and metabolic conditions
- Lifestyle factors, such as tobacco, alcohol, and medication and illicit drug use
- Certain types of environmental exposures

Table 2. Normal semen analysis findings¹¹

| Parameter on at least two occasions | Lower reference limit |
|-------------------------------------|--|
| Ejaculation volume | 1.5 mL |
| pH | 7.2 |
| Sperm concentration | 15 x 10 ⁶ spermatozoa/mL |
| Total number of sperm | 39 x 10 ⁶ spermatozoa/ejaculate |
| Percentage motility | 40% |
| Forward progression | 32% |
| Normal morphology | 4% normal |
| Sperm agglutination | Absence |
| Viscosity | Less than 2-cm thread after liquefaction |

aging via a scrotal ultrasound should be ordered. Color Doppler ultrasound (CDUS) is the gold standard for imaging assessment of varicoceles.¹² An ultrasound can help the provider rule out solid mass, assess the extent of damage to the testicular parenchyma, determine the need and candidacy for surgical treatment options, and assist the surgeon in predicting the effects of therapy.¹³ Ultrasound provides a measurement of venous dilations and reflux in the pampiniform plexus in real time, allowing for higher sensitivity and specificity than a physical exam alone.¹⁴ This test is noninvasive and relatively painless. A typical report that is positive for varicocele would include the degree of reflux assessed by CDUS grading 1 (no varicosities seen with Valsalva) through

5 (spontaneous reflux at rest with no Valsalva) classification system.¹² This form of imaging demonstrates high accuracy, with sensitivity and specificity near 100%.¹² MJ's ultrasound report interpreted a grade 3 varicocele of the left testis.

Treatment

Surgical treatment of a varicocele that is causing impaired sperm production is indicated if the patient currently desires to conceive or plans to conceive in the future. Patients who are symptomatic, usually with pain or reduced testicular size, are also candidates for surgical intervention. Surgery by way of dilating the veins of the pampiniform plexus is currently the gold standard for treatment for a varicocele when fertility is desired to improve venous drainage.¹⁵ It has

over a 90% success rate with minimal complications.⁶ This correction has a direct correlation to increased sperm concentration and the overall motility in males with a higher grade of varicocele.⁵ Surgery usually only takes 30 minutes and is outpatient, with full recovery occurring in 2 to 3 weeks. Lifting restrictions are very short term. Another option is a percutaneous embolism, which is a procedure using metal coils to obstruct the dilated spermatic veins done by an interventional radiologist. With this procedure, there is a small risk of recurrence, but this is dependent on the technique and how the coils were placed.¹⁶ There are currently no effective medical treatments available.¹⁵ Experimental studies are in progress with antioxidant therapy, but this is not currently approved for treatment.¹⁷ Patients who have impaired but not absent sperm production who are not candidates for surgery or prefer not to have surgery may consider intrauterine insemination or in vitro fertilization to conceive. MJ is referred to a urologist for a surgery consult to obtain more information on the surgical procedures available for him related to his testicular pain and the primary infertility. It is important to note that even if his semen analysis would have been normal, a referral should still be made to evaluate the testicular pain and explore surgical options for relief. Untreated varicoceles can cause increased pain to the patient over time, testicular atrophy, and future infertility.⁸

Implications for practice

This case study is an exemplar of a male patient the WHNP may see in a primary or specialty care setting for SRH care. WHNPs are equipped with the appropriate knowledge, skills, and abilities to conduct an initial evaluation for male infertility, including an assessment for a var-

icocele. A patient with a varicocele can often be diagnosed in the office through a focused health history and physical examination. The WHNP can order and interpret semen analyses and a scrotal ultrasound if indicated. Although a referral is necessary for treatment, WHNPs play a pivotal role as the first point of contact for patients with infertility concerns. Continuing education opportunities to update knowledge and skills for providing male SRH can build more confidence in the ability to provide this service that is within the WHNP role and scope of practice. ●

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Overview of the diagnosis and management of uterine fibroids

By Heidi Collins Fantasia, PhD, RN, WHNP, and Allyssa L. Harris, RN, PhD, WHNP-BC

Fibroids are benign uterine tumors that are the leading cause of hysterectomy in the United States. They may be asymptomatic or cause heavy menstrual bleeding, dysmenorrhea, bulk symptoms, and infertility. Multiple options exist for the treatment of fibroids and include expectant management, medical therapy, or surgical interventions. Nurse practitioners are an important part of the healthcare team and can assist women in making individualized decisions about treatment options based on their symptoms and reproductive life plans.

KEY WORDS: uterine fibroids, heavy menstrual bleeding, treatment, hysterectomy



Uterine fibroids, also called uterine leiomyomas or myomas, are benign uterine tumors that grow during the reproductive years and tend to regress after menopause.¹ Fibroids can be asymptomatic and cause no adverse effects or can result in a range of symptoms for which women may seek treatment. They are the leading reason for hysterectomy in the United States.^{1,2} Incidence and prevalence data can vary widely because asymptomatic women may not be aware they have fibroids and never receive a formal diagnosis. It has been estimated, however, that more than 75% of women may have at least one fibroid by the time they reach age 50 years.² This estimate exceeds 80% among women of African descent.³ Considering the prevalence of fibroids, this article provides information on the diagnosis and management of fibroids and discusses treatment options for women who want to preserve their fertility.

The management and treatment of fibroids places an economic burden on both individual women and the healthcare system in the United States.^{4,5} Women with fibroids can incur direct costs associated with treatment, such as those associated with medications, surgery, and hospitalization, as well as indirect costs

that include lost days of work, utilization of sick time, paid time off and short-term disability, and lost wages from uncompensated absences from work.⁴ Costs to the US health-care system are estimated to be over 30 billion dollars per year.⁶

Epidemiology

Fibroids are monoclonal tumors that originate from the smooth muscle (myometrium) of the uterus and consist of extracellular matrix containing collagen, fibronectin, and proteoglycan.⁷ Cells within fibroid tumors are receptive to both estrogen and progesterone, and these receptors stimulate growth that happens during the reproductive years. Declining rates of estrogen and progesterone after menopause contribute to the regression of fibroids that occurs after the menopause transition.² Fibroids are benign but can resemble leiomyosarcoma, a rare form of uterine cancer. Endometrial biopsy and magnetic resonance imaging (MRI) may help determine if sarcoma exists, but a definitive diagnosis can only be made through biopsy of the fibroid tissue.³

Risk factors

Certain factors have been associated with an increased risk of developing fibroids. Women of African descent have the highest risk of fibroids compared with women of all other racial or ethnic backgrounds.⁸ Age is also an important factor. Women who are age 40 to 50 years are more likely to have fibroids than younger women.⁹ Other factors such as an early menarche (< age 10 years), a family history of fibroids, obesity, and nulliparity have also been associated with the development of fibroids.⁹ Women who smoke, are multiparous, had a later menarche (> age 16 years), and have used oral contraceptives are less likely to develop fibroids.²

Symptoms

For many women, fibroids are asymptomatic. Women who have symptoms may present with heavy menstrual bleeding (HMB) and dysmenorrhea. The heavy bleeding may lead to a clinically significant anemia. Other women complain of bulk symptoms from an enlarged uterus, which could include pelvic pressure, back pain, bloating, urinary frequency, and dyspareunia.¹⁰ Women who are seeking pregnancy may experience infertility, subfertility, and recurrent pregnancy loss.¹⁰ Because symptoms have a gradual onset and could be explained by a variety of benign conditions, women often delay seeking a diagnosis by 3 to 4 years.^{6,11}

Diagnosis

Transvaginal ultrasound is the most common imaging modality for the diagnosis of fibroids. A bimanual pelvic exam may reveal an enlarged or irregularly shaped, nontender uterus and palpable firm masses, but diagnosis is confirmed by ultrasound, which helps determine where the fibroids are located.¹¹ Intramural fibroids are the most common and grow within the wall of the uterus. Subserosal fibroids grow on the outside of the uterus and can put pressure on surrounding organs if they become large. Submucosal fibroids grow just below the uterine lining and can extend into the uterine cavity, distorting the size and shape of the cavity. Pedunculated fibroids are less common and grow on a stalk outside of the uterus.¹¹ Although not a first-line imaging modality due to cost, MRI can be helpful in providing more detail about fibroid location and size, especially if there are multiple large fibroids, body habitus limits ultrasonography results, fibroids extend outside of the uterine cavity, transvaginal ultra-

sound is not tolerated, or if surgery is being considered.^{10,11}

HMB with the finding of an enlarged uterus or mass is clinically suggestive of fibroids but can also be caused by other conditions. Adenomyosis, which is growth of endometrial glands and stroma within the myometrium, can cause heavy bleeding. On exam, the uterus is often enlarged, globular in shape, and tender.² Masses may be caused by endometriosis and carcinoma of the uterus and ovaries. Uterine polyps and endometrial hyperplasia can also result in HMB.³ Although rare, uterine sarcoma, which closely resembles benign fibroids on ultrasound, is possible. Pathologic evaluation of any mass is the only way to definitively differentiate between benign and malignant tumors.^{2,3}

Impairment of fertility

Fibroids have the ability to impair fertility, but size, number, and location are important factors. Submucosal fibroids may cause anatomic changes that distort the size and shape of the uterine cavity. This can alter the endometrium, interfere with endometrial blood supply, and potentially affect implantation and increase the risk of spontaneous pregnancy loss. Fibroids can also increase uterine contractility and are associated with preterm delivery, lower birthweight infants, breech presentation, and surgical birth.^{4,12}

Treatment

Depending on a woman's symptoms, number of fibroids, and location, there are multiple treatment options. Additionally, a woman's age and whether she wishes to preserve her fertility are important aspects when discussing available treatments. Individualized treatment should consider all of these factors and result in shared decision making

Table. Medical management options for fibroids^{2,3,10}

| | |
|--|--|
| NSAIDs for 5 days during menses | Ibuprofen 800 mg PO 3 times daily or naproxen 500 mg PO twice daily or mefenamic acid 500 PO initially, then 250 mg PO every 6 hours |
| Tranexamic acid for 5 days during menses | 1,300 mg PO 3 times daily |
| 52-mg progestin IUD | Continuous use |
| Combined oral contraception | Can be taken continuously or incorporate a withdrawal bleed |
| Depot medroxyprogesterone acetate | 150 mg IM or 104 mg SQ every 13 weeks |
| Gonadotropin-releasing hormone agonists (generally limited to 3 months prior to surgery) | Leuprolide acetate 3.75 mg IM monthly for 3 months or leuprolide acetate 11.25 mg IM as single injection working for 3 months |
| Selective progesterone receptor modulators | Ulipristal acetate 5 mg PO daily for 3 months* |

* Approved for use in Europe and Canada; not currently approved in the United States. IM, intramuscularly; IUD, intrauterine device; NSAIDs, nonsteroidal anti-inflammatory drugs; PO, by mouth, orally; SQ, subcutaneously.

Note: A patient handout on fibroids is included on page 48.

between the woman and her health-care provider.

Expectant management

If fibroids are causing no symptoms and/or were an incidental finding on ultrasound, if they are causing mild symptoms, or if the woman declines medical or surgical treatment, expectant management is an option. Fibroids often regress with menopause, so expectant management may be a viable option for women who are approaching menopause.¹⁰ Women who initially choose expectant management should be encouraged to report any change in symptoms such as increasing pain, heavy bleeding, or pelvic pressure. Healthcare providers should evaluate all women with heavy bleeding for anemia and reevaluate the need for medical or surgical intervention based on reported symptoms and clinical presentation. There are no published evidence-based guidelines for how often women should be followed with ultrasound or pelvic exams, although an annual evaluation has been suggested.^{1,11}

Medical options

Multiple medical options exist for the management of symptoms associated with fibroids (*Table*).^{2,3,10} Dysmenorrhea and HMB are two of the most common complaints. For women who primarily report dysmenorrhea and heavier menses, nonsteroidal anti-inflammatory drugs (NSAIDs) can be taken during menses to reduce discomfort and bleeding. Tranexamic acid, an oral antifibrinolytic, can be taken for 5 days during menstrual bleeding to decrease menstrual blood loss.¹¹ This treatment can have the potential to cause thrombotic events, however, and is therefore not appropriate for women with active thromboembolic disease, a history of thromboembolism, or intrinsic risk of thromboembolism. Due to the increased risk of thrombosis, tranexamic acid should not be combined with estrogen-containing contraception.

Hormonal options exist for the management of fibroid symptoms that also provide contraception.^{3,11-14} Most of these options, however, are used off label to treat

the symptoms associated with fibroids and are not approved by the US Food and Drug Administration (FDA) for that purpose. Progestin-containing intrauterine devices (IUDs) that contain 52 mg of levonorgestrel (LNG) reduce heavy bleeding and decrease dysmenorrhea. The LNG-intrauterine system 20 with 52-mg LNG is FDA approved for the medical treatment of HMB. Expulsion of IUDs is higher among women with fibroids and if fibroids distort the uterine cavity, IUD placement may be challenging or contraindicated.^{3,11,12} Depot medroxyprogesterone acetate (DMPA) will decrease bleeding and possibly induce amenorrhea, thus controlling some of the most bothersome fibroid symptoms.³ DMPA may reduce bone mineral density (BMD), however, and decisions on the length of treatment will need to be made individually. Combined hormonal oral contraceptive pills are also an option to control bleeding and discomfort. A main disadvantage of all of these options is that they provide symptom management but do not reduce the size of fibroids.³ Thus, although these therapies may help control HMB and dysmenorrhea, bulk symptoms are unaffected.¹¹⁻¹³

Gonadotropin-releasing hormone (GnRH) agonists induce amenorrhea, produce a hypoestrogenic state, and reduce uterine volume, including the size of fibroids. Leuprolide acetate is most commonly used. Due to the hypoestrogenic adverse effects of bone loss and vasomotor symptoms, treatment is limited to 3 to 6 months.^{10,11} Typically, GnRH agonists are used concurrently with iron therapy for 3 months prior to surgery to correct anemia and reduce fibroid bulk to improve surgical outcomes. If they are used for an additional 3 months, norethindrone acetate 5 mg orally once daily is rec-

ommended to correct some of the hypoestrogenic effects, including decreased BMD.^{10,14}

Selective progesterone receptor modulators (SPRMs), such as ulipristal acetate, are widely used in Canada and Europe but have yet to receive approval in the United States. SPRMs work by acting as agonists or antagonists on progesterone receptors. They have a direct effect on the endometrium and modulate progesterone pathways that are involved with fibroid growth.^{12,14–16} Outside of the United States, SPRMs are used preoperatively to control bleeding, correct anemia, and decrease fibroid bulk prior to surgery.¹²

Surgical options

There are several surgical options for the management of fibroids for women who have severe symptoms and/or have not responded to expectant management or medical treatment. These include hysterectomy, laparoscopic or abdominal myomectomy, uterine artery embolization, and ablation by high-intensity focused ultrasound.¹ Decision making in regard to surgical management should include a discussion of the woman's fertility status, whether she wants to preserve fertility, consideration of preserving the uterus, and past medical and surgical history as well as quality-of-life outcomes.^{1,3,11}

Hysterectomy provides a definitive cure, complete symptom relief, and improved quality of life for women who do not wish to retain their uterus, have no fertility preservation concerns, and are appropriate candidates for surgery. Hysterectomy is the second most common surgical procedure in the United States, with approximately 600,000 performed annually.¹⁷ Approximately 90% of hysterectomies are performed due to benign

conditions, and fibroid symptoms account for approximately 30% of these cases.⁷ Hysterectomy may be performed laparoscopically, vaginally, or abdominally depending on uterine and fibroid size. Vaginal hysterectomy is the most common and the preferred approach.¹³ It offers significant advantages over laparoscopic and abdominal procedures including shorter surgical time, decreased blood loss, decreased risk of paralytic ileus, decreased length of hospital stay, as well as lower overall healthcare costs.¹⁸ Vaginal hysterectomy is not appropriate when fibroids or the overall uterine size are very large.²

Alternatively, hysterectomy may be performed laparoscopically (with or without robotic assistance) or as a laparoscopically assisted vaginal procedure. Both vaginal hysterectomy and laparoscopic procedures are considered minimally invasive surgical approaches due to the small abdominal incision, shorter hospital stays, and decreased recovery time.¹⁹ Laparoscopic procedures for hysterectomy are increasingly common, rising from 26.1% in 2010 to 43.4% in 2013, with many of these procedures shifting to outpatient surgery.²⁰ Additionally, morcellation during laparoscopic hysterectomy may be performed. Morcellation allows the uterus to be cut into small pieces by a rotating blade before extraction. This procedure, however, is used sparingly due to concerns about iatrogenic dissemination of benign and malignant tissue. The FDA has recommended limiting the use of morcellation techniques to women who are not candidates for en-bloc uterine resection.²¹ This would include women with large or obstructive fibroids, a significantly enlarged uterus, and women with abdominal adhesions.^{2,22} The American College of Obstetricians and

Gynecologists (ACOG) considers morcellation to be an option for women who have received informed consent but recommends against its use in women with known or suspected uterine cancer.²²

Removal of fibroids may also be done by myomectomy (ie, surgical excision of fibroids and uterine reconstruction) for women seeking to preserve their uterus and/or fertility. It may be performed by laparotomy or laparoscopy depending on the number, size, and location of the fibroids. A recent meta-analysis of research found that laparoscopic myomectomies were associated with less postoperative pain, lower postoperative febrile morbidity, shorter hospital stays, and greater full recuperation by postoperative day 15.²³

Uterine artery embolization (UAE) is a minimally invasive interventional radiologic procedure in which occluding agents are injected into the uterine arteries causing ischemic necrosis to the uterus and fibroids. This option is available for women seeking to preserve their uterus but is not appropriate for women who wish to preserve their fertility. UAE can be highly effective for treatment of symptoms, but women undergoing this procedure are at increased risk for reoperation (15%–32% within 2–5 years) compared to hysterectomy and myomectomy (7%).¹³ In randomized controlled trials, UAE has been shown to improve quality of life similar to surgery results but with shorter hospitalization and earlier resumption of daily activities.²⁴ Complications associated with this procedure include risk of infection and abdominal pain due to ischemic necrosis of fibroids. In addition, UAE is contraindicated in women desiring future pregnancies due to ovarian reserve and myometrium compromise.^{12,13} In a recent systematic review examining UAE and fertil-

A woman's age, severity of symptoms, and whether she wishes to preserve her fertility often guide the conversation about which treatment is most appropriate.

ity, researchers found that only 50% of women achieved pregnancy after UAE compared to 78% who had a myomectomy.²⁵

High-frequency magnetic resonance-guided focused ultrasound surgery (MRgFUS) is a minimally invasive procedure that uses MRI to target and destroy fibroid tissue using thermal ablation.²⁶ Theoretically, damage to surrounding tissue should be minimal, but a small risk of injury to surrounding structures cannot be excluded.^{27,28} The use of this procedure is limited by desire for future fertility, presence of intracavitary fibroids, large fibroid volume, and insurance coverage.²⁹ MRgFUS is well tolerated by women, although complaints about heavy bleeding and localized pain can occur.^{2,30}

Practice implications

Women who are diagnosed with fibroids have multiple options for treatment that range from expectant management to hysterectomy. A woman's age, severity of symptoms, and whether she wishes to preserve her fertility often guide the conversation about which treatment is most appropriate. Women in the fourth decade of life who are expected to transition to menopause may choose a less aggressive approach, as fibroids regress with declining estrogen and progesterone levels of menopause. Nurse practitioners (NPs) can manage the care

of women who choose a medical or expectant option. Many noninvasive medical options exist, and based on a woman's symptoms, treatment can be initiated with inexpensive therapy such as NSAIDs and response to treatment evaluated. Regardless of the medical option, all women with fibroids who report HMB should have a complete blood count and ferritin level measured to assess for anemia.^{31,32} Correction of anemia with oral iron therapy is important, especially if a woman eventually chooses to have surgery. Additionally, endometrial biopsy is indicated if there is sonographic evidence of endometrial hyperplasia or prolonged, erratic, or heavy bleeding is concerning in regard to the possibility of malignancy.³²

If women have completed childbearing and/or are experiencing multiple symptoms, a surgical treatment may be an appropriate option. Hysterectomy will bring a definitive end to all fibroid symptoms. Complicated cases and surgical approaches require consultation with physician colleagues, but NPs who care for women with fibroids can provide guidance and clarification on all available options, answer questions, and provide anticipatory guidance about recovery. Although care will be co-managed, NPs can remain an integral member of the healthcare team.

The two primary risk factors for fibroids, advancing age and race,

are nonmodifiable. Other modifiable lifestyle factors such as obesity, diet, physical activity, and stress have been associated with the risk of developing fibroids.⁹ These associations have been identified retrospectively after a woman has been diagnosed with fibroids, however, and how much each individual factor contributes to fibroid development is unknown. Although recommending a diet low in processed foods and high in fruits and vegetables, encouraging regular physical activity, maintaining a normal BMI, and reducing stress are appropriate interventions for all women, these actions are not a guarantee against the development of fibroids.³³

Fibroids are often asymptomatic. If symptoms occur, HMB is the most common. The increase in bleeding is often gradual and insidious, however, and women may not immediately recognize that bleeding is heavier.³² Additionally, they may believe that the increased bleeding is a normal part of the menstrual cycle, especially as they approach perimenopause. During preventive healthcare visits, NPs should inquire about menstrual bleeding, any changes in bleeding patterns, and other symptoms associated with fibroids such as increased dysmenorrhea, dyspareunia, and pelvic pressure.¹¹

Fibroids are estimated to affect between 10% and 20% of women who are pregnant.¹⁰ Once pregnancy is established, treatment is deferred until after delivery and fibroid size is monitored with serial ultrasound. Women should be advised to report any contractions, abdominal pain, rhythmic back pain, bleeding, or leaking of fluid. Closer follow-up with more frequent visits, measurement of fundal height, and ultrasound assessments is prudent, especially with larger or multiple fibroids.

Conclusion

Fibroids are benign uterine tumors that affect many women and can significantly impact quality of life, increase financial burden, and contribute to infertility. An array of treatment options exists that can be tailored to a woman's symptoms and reproductive life plans. NPs are an integral part of the healthcare team for women, including participating in the coordination and management of care. As such, they are well positioned to provide education and assist women in making individualized decisions about their healthcare. ●

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