

CASE

1

A 45-year-old woman with heavy vaginal bleeding

Tod C. Aeby

History of present illness

A 45-year-old gravida 6, para 6 woman presents to the emergency department with a complaint of 2 days of heavy vaginal bleeding and passing clots. She is light-headed and short of breath. Previously she had regular but heavy periods. A few days prior to this bleeding episode she noted increasing pelvic pressure and a malodorous vaginal discharge.

Her past medical history is significant for recurrent anemia thought to be from abnormal uterine bleeding. Her surgical history is significant for a previous postpartum tubal ligation. She takes no medications.

Physical examination

General appearance: Well-developed, moderately obese woman in moderate distress

Vital signs:

Temperature: 38.1°C

Pulse: 120 beats/min

Blood pressure: 92/68 mmHg

Respiratory rate: 18 breaths/min

Oxygen saturation: 98% on room air

Abdomen: Soft with suprapubic tenderness to deep palpation, no guarding or rebound

Pelvic: Active vaginal bleeding and a large firm mass presenting at the vaginal introitus (Fig. 1.1). You are unable to do a speculum or bimanual examination

Laboratory studies:

Urine pregnancy test: Negative

WBCs: $21\,000/\mu\text{L}$ (normal $3.8\text{--}11.2 \times 10^9/\text{L}$)

Hb: 4.8 g/dL (normal 11.6–15.1 g/dL)

Ht: 16.2% (normal 34.1–44.2%)

How would you manage this patient?

This patient clearly has a prolapsing submucous myoma complicated by severe anemia, hypovolemia, and likely infection. Her management requires immediate fluid resuscitation and correction of her anemia, in preparation for surgical removal of the myoma. With a 96% success rate, vaginal myomectomy in the operating room, under general or regional anesthesia, is the therapy of choice. Given her fever, elevated white blood cell count, and malodorous discharge, preoperative broad spectrum intravenous antibiotics are warranted.

The patient received aggressive fluid resuscitation, and was transfused four units of packed red blood cells. A second-generation cephalosporin was started 30 minutes before going to the operating room, where she was placed under general anesthesia. After she was prepped and draped, a single-tooth tenaculum was placed on the myoma and, while avoiding excessive downward traction, gentle torque was applied. The myoma moved easily through several rotations before detaching. Hysteroscopy was not possible due to the widely dilated cervix. Gentle sharp curettage was performed to assess the cavity and to obtain an endometrial sample. Hemostasis was adequate and the patient tolerated the procedure well. After recovery from anesthesia, she was asymptomatic and discharged following overnight observation.

Prolapsing submucous myomas

Uterine myomas are the most common tumors of the female reproductive tract, occurring in 20–40% of women [1]. Submucous myomas (those that lie just beneath the endometrial lining)



Fig. 1.1 Typical appearance of a prolapsing submucous uterine myoma.

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constitute about 5% of all leiomyomas and a small proportion will become pedunculated (suspended from a stalk) and be expelled from the uterus. The largest study looking at this issue found that about 2.5% of all myomas will prolapse through the cervix [2]. As the myomas prolapse, the stalk will be stretched and the blood supply compromised. Necrosis and secondary infections are common and, as in this patient, leads to the frequent complaint of a malodorous vaginal discharge. Other presenting symptoms include acute vaginal bleeding (59%), heavy and irregular vaginal bleeding (74%), uterine cramps (20%), pelvic pressure (15%), and, occasionally, urinary retention [2].

While in this patient the diagnosis of a prolapsed myoma was quite obvious, usually the myoma has only prolapsed through the cervix and will not be diagnosed prior to a vaginal exam. The differential diagnosis should include an endometrial polyp, a cervical or vaginal neoplasm, and an endocervical (Nabothian) cyst. Prolapsing polyps are the second most common finding and will typically have a soft texture and a ragged appearance, as opposed to the firm, smooth texture of a myoma. Necrosis and infection can make the gross appearance indistinct and the final determination requires pathologic analysis. Leiomyosarcomas are quite rare.

Imaging, such as a pelvic ultrasound, is occasionally useful to identify the presence of additional myomas. In some cases MRI can be used to confirm the diagnosis of a myoma and to localize and characterize the stalk to aid in selection and planning of a surgical approach [3].

Patients with suspected prolapsing myomas should be managed in the operating room with adequate anesthesia and the ability to respond to complications, particularly bleeding. Preoperative counseling should include discussion of rare complications, such as severe infection, excessive bleeding, uterine perforation, and an approximately 5% rate of conversion to hysterectomy. In the vast majority of cases, a simple vaginal myomectomy is the procedure of choice and consists primarily of grasping the myoma with a ring clamp or a single-toothed tenaculum and gently twisting until it is released. Occasionally, myomas may be broad based. These myomas typically do not rotate easily and visualization of the stalk is obscured. In these cases, the myoma may require morcellation (cutting the myoma into smaller pieces using a scalpel, electrosurgical loop, or bovie) to aid in removal. Broad-based pedicles may require clamping or suture ligation and laparoscopic endoloops may be helpful. Care should be

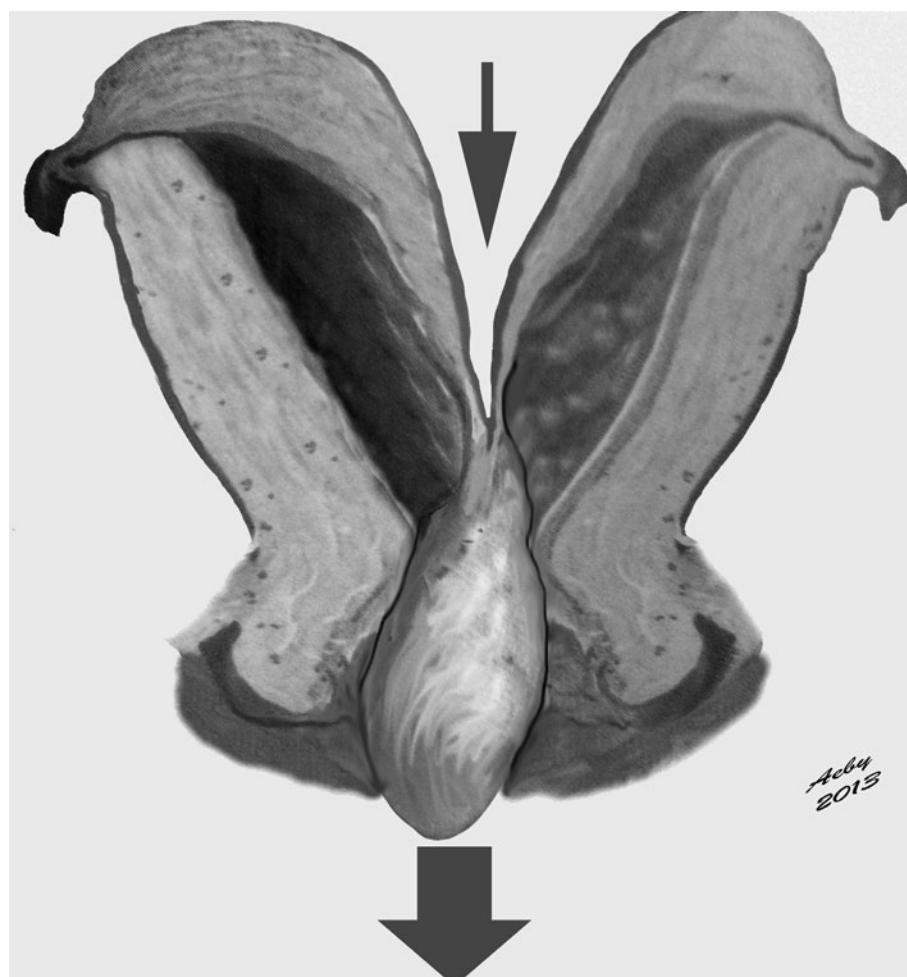


Fig. 1.2 Excessive downward traction can lead to uterine inversion, placing the fundus of the uterus at risk for rupture or perforation.

Case 1: A 45-year-old woman with heavy vaginal bleeding

exercised when twisting the pedicle since lacerations of the uterus and even the bladder have been described when too much torque was applied to a broad pedicle. Additionally, excessive downward traction can lead to inversion of the uterus and subsequent rupture or perforation of the fundus during resection (Fig. 1.2). In the case of a broad pedicle, where firm traction is required for adequate exposure, consideration should be given to a combined laparoscopic and vaginal approach. If heavy bleeding develops or persists after the myoma has been removed, a Foley catheter with a 30-cc balloon can be inserted through the cervix and inflated until it tamponades the site of hemorrhage [4]. If the balloon has been placed and bleeding continues, ultrasound or laparoscopy should be used to rule out uterine rupture or perforation. At that point, hysterectomy may be required to control the hemorrhage.

Other surgical options for managing a prolapsed submucous myoma include hysterectomy via a vaginal, abdominal, or minimally invasive approach. If the prolapsing myoma is significantly distorting the lower uterine segment, removing the myoma separately may facilitate the procedure. However, due to the low morbidity and effectiveness of vaginal myomectomy, hysterectomy should be reserved for patients who fail an attempt at myomectomy or who have persistent bleeding after the procedure. Because the myomas are often necrotic, severe intra-abdominal infections have been reported following hysterectomy [2]. Thus, antibiotics sufficient to cover normal vaginal flora (in most cases a second-generation cephalosporin) should be started prior to the hysterectomy and continued until the patient is afebrile for at least 24 hours.

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Following the myomectomy, the vast majority of women (80%) will have a normal or only slightly enlarged uterus and return to having regular menstrual periods. Some even become pregnant and go on to have a normal, term delivery. Cervical insufficiency has been reported, but there is inadequate published data with which to advise patients. Twenty percent of patients with successfully treated prolapsing myomas will require removal of additional myomas or a hysterectomy over the next several years. The tissue removed at vaginal myomectomy should be submitted to pathology to rule out malignancy. Routine gynecologic care should be sufficient follow-up for most patients.

Key teaching points

- Prolapsed submucous uterine myomas are relatively common.
- Presenting symptoms include vaginal bleeding, pain, pelvic pressure, malodorous vaginal discharge, and, occasionally, urinary retention.
- Vaginal myomectomy is a simple and highly successful method of treatment and should represent the first-line approach.
- During a vaginal myomectomy, avoid aggressive rotation and excessive downward traction.
- Following vaginal myomectomy, most women return to their normal menstrual cycle.
- As myomas are frequently necrotic and infected, preoperative broad spectrum prophylactic antibiotics are important.

CASE

2

A 29-year-old woman with a pelvic mass and altered mental status

Saweda A. Bright and Stephen A. Cohen

History of present illness

A 29-year-old gravida 0 African-American woman was transferred to a tertiary care hospital emergency department for management of cardiac arrest and altered mental status. Approximately two weeks prior, she had diarrhea, nausea, and vomiting, followed by a fall in the bathroom, which was presumed to be a syncopal event. She subsequently developed altered mental status with delusions and psychosis, which resulted in admission to the psychiatric ward at a community hospital. There, she was given several antipsychotic medications without any improvement in her symptoms.

When her clinical symptoms worsened, this prompted hospital transfer to a higher level of care. Upon transfer, she was tachycardic and had periodic episodes of sinoatrial arrest. She was transferred to the ICU for management, where she then experienced a generalized seizure. Her deteriorating symptoms prompted cardiology consultation and pacemaker placement for management of her cardiac arrhythmia. She ultimately required intubation and sedation.

The patient's past medical history was negative for any psychiatric, cardiac, or seizure disorders. Her past surgical history was notable for a right salpingo-oophorectomy three years ago with pathology confirming a mature cystic teratoma.

Physical examination in the ICU

General appearance: Thin, reclining, sedated woman

Vital signs:

Temperature: 37°C

Pulse: 77 beats/min

Blood pressure: 96/54 mmHg

Respiratory rate: 12 breaths/min on mechanical ventilation

Oxygen saturation: 100% on the ventilator

BMI: 14 kg/m²

HEENT: Oral endotracheal tube in place, dysconjugate gaze, 2 mm pupils, sluggishly reactive to light

Cardiovascular: Pacemaker in place, native sinus rhythm apparent

Lungs: Clear to auscultation bilaterally

Abdomen: Hypoactive bowel sounds, soft, nondistended

Extremities: Palpable distal pulses, no cyanosis or edema

Neurologic: Clonus bilaterally, hyperreflexic

Laboratory studies:

Arterial blood gas, electrolytes, liver function, thyroid, and coagulation studies: All within normal limits

Lactate: Normal

HIV: Negative

RPR: Nonreactive

Toxicology screen: Negative

Lumbar puncture: Revealed evidence of aseptic meningitis with a prominence of lymphocytes

Imaging:

Chest radiograph: Showed endotracheal tube in the appropriate position

Head CT and head MRI: Both within normal limits

Cervical spine MRI: Unremarkable

EEG: No evidence of seizures, but did show findings thought to be consistent with encephalopathy

Abdominal/pelvis CT: Revealed a left adnexal complex cystic mass measuring 4.3 × 5.4 cm and noted to contain numerous internal calcifications and solid nodular components. A solid nodule was medially measured at 18 mm. These findings were suggestive of a cystic teratoma (Fig. 2.1)



Fig. 2.1 CT of female pelvis. Arrow signifies left ovarian teratoma with numerous calcifications within a complex cystic ovarian mass.

Case 2: A 29-year-old woman with a pelvic mass and altered mental status

How would you manage the patient?

The diagnosis is anti-*N*-methyl-D-aspartate-receptor (anti-NMDA-R) encephalitis. The ICU team suspected the diagnosis based on the patient's clinical presentation and course, and consulted the Gynecology team for surgical management. The diagnosis was based exclusively on clinical suspicion. The patient was taken to the operating room and underwent an exploratory laparotomy with left ovarian cystectomy to remove the pelvic mass (Fig. 2.2).

Surgical pathology confirmed a mature cystic teratoma containing brain tissue with brisk perivascular lymphocytic infiltrates that was thought to be related to the presence of circulating anti-NMDA-R antibodies. The final diagnosis was confirmed when the patient's serum NMDA-R antibody titer returned highly positive.

A multidisciplinary approach was used to care for the patient. In addition to the Gynecology team, the ICU team consulted Neurology, Infectious Disease, Endocrinology, Cardiology, Dermatology, Psychiatry, and Physical Medicine and Rehabilitation teams. The patient was treated with intravenous immunoglobulin, methylprednisolone, rituximab, and plasmapheresis. Her symptoms slowly reversed. She was transferred out of the ICU 29 days after her surgery. On that day, she was noted to be alert, interactive, and although not fully recovered clinically, trying to communicate.

The patient remained in the hospital for two months recovering from her acute events, followed by two months of care in a rehabilitation facility. Eight months following her initial presentation, she was being followed as an outpatient in the office and noted to have complete recovery.

Anti-NMDA-R encephalitis

Anti-*N*-methyl-D-aspartate-receptor (anti-NMDA-R) encephalitis was first described in the literature in 2007. The illness was originally diagnosed in women who presented with a



Fig. 2.2 Sectioned mature cystic teratoma with presence of brain tissue and sebum.

constellation of clinical findings, including severe neuropsychiatric symptoms, an ovarian teratoma, and autoantibodies targeting glutamate receptors, specifically NMDA-type receptors. NMDA receptors are ligand-gated cation channels located on the post-synaptic membranes that are responsible for synaptic transmission and plasticity. Antibodies binding to the NR1 subunit of the NMDA-R results in the characteristic symptoms associated with the syndrome [1].

The true incidence of NMDA-R encephalitis is unknown. Although initially described in women, the syndrome has also been described in children under the age of 18 years and men.

The clinical course occurs in several phases. Initially, there is a prodromal phase during which patients experience nonspecific flu-like symptoms. Patients may experience headaches, fevers, nausea, vomiting, diarrhea, fatigue, and upper respiratory symptoms. Within a couple weeks of these initial symptoms, patients develop psychiatric symptoms, which can include anxiety, insomnia, delusions, mania, hallucinations, or memory deficits. Patients are often initially evaluated by a psychiatrist and treated with antipsychotic medications during this phase. In the subsequent stage of the disease, patients experience decreased consciousness and may become unresponsive, as this patient did. They may alternate between periods of catatonia and agitation. They can experience lethargy, seizures, autonomic instability (hyperthermia, hypertension, hypotension, tachycardia, bradycardia) and dyskinesias, with oro-lingual-facial dyskinesias being most characteristic. Eventually, patients may go into status epilepticus or a comatose state. Patients frequently require ICU management. Interestingly, as patients respond to therapy, symptoms usually resolve in the reverse order of how they originally presented.

Dalmau and colleagues found that about 75% of patients with anti-NMDA-R encephalitis either completely recover or have mild sequelae [1]. The remaining patients were either severely disabled or died. Prognosis depends on early diagnosis and treatment.

The diagnosis of anti-NMDA-R encephalitis is made based largely on clinical suspicion from the presenting symptoms, with the addition of results from laboratory and radiologic studies supporting the diagnosis. Oftentimes, physicians must act based on clinical suspicion alone in order to provide life-saving care with removal of teratoma, as the results of antibody tests may take several weeks. The disease is frequently unrecognized due to its uniqueness among paraneoplastic syndromes, since it involves young women with primarily psychiatric symptoms and brain MRI findings that can be either normal or atypical [2]. In the initial paper documenting this disorder, Dalmau and colleagues noted that the time from development of neurologic symptoms to diagnosis of teratoma ranged from three weeks to four months [1]. Anti-NMDA-R encephalitis should be suspected in patients with unexplained psychiatric symptoms, especially with a flu-like prodrome, who then develop cardiac or respiratory compromise. If the diagnosis is suspected, a multidisciplinary approach should be employed. The most important diagnostic finding is the

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detection of anti-NMDA-R antibodies in the patient's serum or cerebrospinal fluid. The severity of symptoms correlates with the amount of anti-NMDA-R antibodies in circulation. Physicians may follow the antibody titers to help determine clinical response to therapy, as a decrease in titers correlates with clinical remission.

MRI of the brain is abnormal in about half of patients and, in those cases, will reveal T2 signal hyperintensity in the hippocampi, cerebellum, cerebral cortex, basal ganglia, or brain stem [1]. EEGs are abnormal in most patients showing nonspecific, slow, and disorganized activity with seizures. In catatonic patients, EEGs show slow, continuous, rhythmic activity in the delta-theta range [1]. Despite these EEG changes, patients usually do not respond to antiepileptic medications.

Cerebrospinal fluid analysis is abnormal in the vast majority of patients and may reveal moderate lymphocytic pleocytosis, normal or mildly elevated protein concentration, and oligoclonal bands. Brain biopsy is unnecessary for diagnosis because findings are usually normal or ambiguous.

About 60% of anti-NMDA-R encephalitis patients have coexisting tumors, with ovarian teratomas being the most common in women [3]. Testicular teratomas and small cell lung cancers have been found to be associated in men diagnosed with the illness. Pathologic reviews of the tumors have shown the manifestation of nervous tissue, which tests positive for anti-NMDA-R antibodies. Since the presence of teratomas appears to be related to anti-NMDA-R encephalitis and their timely removal affects the prognosis, patients should be screened for the presence of a teratoma with MRI, CT scan, or ultrasonography. Identification of a teratoma and subsequent removal is crucial to the prognosis; therefore, physicians should perform one of the aforementioned imaging modalities to identify a teratoma in patients with unexplained mental status changes and cardiac or respiratory compromise. It is important that physicians do not wait on the results of antibodies before surgical removal of the teratoma is performed.

Management of anti-NMDA-R encephalitis includes immediate supportive care. Patients with evidence of a teratoma should have the entire tumor removed as soon as

possible. This may be accomplished with a cystectomy or an oophorectomy. Early removal is essential to patient recovery. First-line medical therapy consists of corticosteroids, intravenous immunoglobulin, and plasma exchange. Patients with an associated teratoma usually respond well to first-line therapy. Second-line therapy consists of rituximab and/or cyclophosphamide. Second-line therapy is recommended for patients without evidence of teratoma, patients who have delayed diagnosis, or patients who do not respond to first-line therapy within 7–10 days after tumor removal. To date, no standard algorithm for management exists, so a multidisciplinary approach is recommended to best care for patients.

In approximately 75% of cases, patients have substantial regression of symptoms, with the remaining 25% suffering from either severe neurologic deficits or death [3]. Relapses can occur in 20–25% of patients, usually those without teratoma. In these patients immunotherapy may be considered for up to one year after clinical recovery. Additionally, clinicians may consider periodic screening for ovarian teratomas for at least two years after clinical recovery. It is common for patients to experience amnesia and require rehabilitation, physical therapy, or psychotherapy. Even after initial signs of recovery, patients need to have continued supportive care as complete recovery may take years.

Key teaching points

- Anti-*N*-methyl-*D*-aspartate-receptor (anti-NMDA-R) encephalitis is a disease that affects mostly women. It most commonly presents with psychotic symptoms, autonomic instability, and ovarian teratomas.
- High clinical suspicion with early recognition, expedient tumor removal, and initiation of immunomodulatory therapy are crucial to patient recovery and survival.
- Final diagnosis is made by confirmation of anti-NMDA-R autoantibodies in the serum or cerebrospinal fluid.
- Therapy should be initiated based on high clinical suspicion, even if results of final diagnostic studies are still pending.
- First-line treatment involves immediate tumor removal, intravenous immunoglobulin, and corticosteroids.

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CASE

3

Acute exacerbation of chronic pelvic pain in a 32-year-old woman

Lee A. Learman

History of present illness

A 32-year-old gravida 3, para 3 woman presents to your emergency department (ED) with a complaint of midline lower abdominal pain rated at 10 out of 10 on the pain scale. She has used extended-cycle birth control pills (84 days) to suppress her menstruation for 2 years since undergoing laparoscopic treatment for endometriosis. Yesterday, on her first pill-free day, she began to have vaginal bleeding and severe cramping pain. She's had no nausea, vomiting, dysuria, frequency, or urgency, and no change in her bowel habits. She is monogamous with her husband. Her other medical problems include irritable bowel syndrome, depression controlled with sertraline 50 mg daily, and fibromyalgia treated with gabapentin 900 mg daily.

She has had pelvic pain since menarche at age 12. At first she had pain the day before and during the first three days of her periods, with no pain on the lighter fourth and fifth days, and no pain between her periods. Later, during college, her pain worsened and eventually occurred during most of the month. She has undergone four laparoscopies in the last 10 years to excise or ablate endometriosis. The last procedure two years ago improved her menstrual pain for three months, but it gradually returned. Extended-cycle birth control pills have reduced her periods to just four per year, with some light days of spotting in-between. She continues to have daily pain requiring hydrocodone 10 mg/acetaminophen 325 mg, 2 pills every 6–8 hours, every day. When she has periods the pain becomes uncontrollable and she comes to the emergency room for additional medication.

Physical examination

General: Well-developed, well-nourished woman grimacing and holding her lower abdomen

Vital signs:

Temperature: 37.0°C

Pulse: 90 beats/min

Blood pressure: 128/76 mmHg

Respiratory rate: 18 breaths/min

Oxygen saturation: 100% on room air

Abdomen: Soft, no masses, lower abdominal/suprapubic tenderness without rebound or guarding, normal bowel sounds

External genitalia: Unremarkable

Vagina: No lesions; scant discharge

Cervix: Parous; scant blood

Uterus: Retroverted, tender, normal size, minimal mobility

Adnexa: Nontender; without masses

Laboratory studies: Urine pregnancy test: Negative

How would you manage the patient?

The patient has an acute exacerbation of chronic pelvic pain and endometriosis, which started on her first pill-free day after completing an extended-cycle pill pack. Her baseline pain is managed with opioid medication that is not providing adequate pain relief. Because her physical examination showed only midline lower abdominal and uterine tenderness in the setting of mild vaginal bleeding, a pregnancy test was performed. No other tests were ordered.

The patient was given ibuprofen 800 mg PO and a heating pad was placed on her lower abdomen. After 1 hour her pain level improved to a 6 out of 10 on the pain scale. She was discharged 1 hour later with a tolerable pain level of 4 out of 10 on the pain scale. Discharge instructions were to continue using heat and ibuprofen 800 mg every 6–8 hours, start her next contraceptive pill pack immediately, and see her primary care doctor within 2 weeks to discuss a continuous active pill regimen. She was advised to continue taking her medications for chronic pelvic pain, depression, and fibromyalgia on schedule.

Acute pain management for chronic pelvic pain

An American College of Obstetricians and Gynecologists (ACOG) Committee Opinion published in 2012 highlights the burden of prescription drug misuse or abuse, which in 2009 led to over 1.2 million ED visits, a greater number than the 974 000 ED visits from illegal drug abuse [1]. It can be challenging to determine whether a patient on prescription opioids coming to the ED with pain is demonstrating signs of drug abuse or has an acute cause of pain that is refractory to their usual analgesic regimen. It is prudent to first rule out acute causes.

As our patient had mild vaginal bleeding, midline lower abdominal cramping pain, and no signs of infection, peritonitis, gastrointestinal or urinary tract abnormalities, it is critical to exclude pregnancy. Additional evaluation is rarely warranted. Although urinalysis from a voided specimen could rule out an acute urinary tract infection, the timing of our patient's

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symptoms, concomitant bleeding, and pelvic examination findings favor a uterine source (dysmenorrhea). Without lateralizing signs and symptoms suggestive of an adnexal process or appendicitis, pelvic ultrasound or CT scanning would also not be warranted. These tests add cost and delay and, in the case of CT scanning, unnecessary radiation exposure.

This patient was not given parenteral opioids, which are commonly used in the ED while evaluation is underway for patients with acute pain. Because of the challenges of coping with chronic pain, patients who have a pain flare may seek care in the ED for rapid control of their pain rather than relying on nonopioid medications or other approaches. Although parenteral opioids may provide immediate relief, their benefits are not long-lasting, and at best provide a bridge to specific treatments aimed at the conditions causing the pain [2]. In this case it was possible to complete the history and physical examination without acute pain relief. However, short-term parenteral opioid treatment to aide evaluation of acute pain would be appropriate if needed.

For patients with acute pain from dysmenorrhea there are many effective treatments (Table 3.1). The application of heat to the lower abdomen can be as effective as acetaminophen or ibuprofen [3]. If heat alone is ineffective, nonopioid analgesics can be added or substituted. In our case the patient's baseline

pain regimen includes 2600 mg of acetaminophen. Although up to 4 g acetaminophen per day is safe in patients without chronic liver disease, ibuprofen's prostaglandin inhibition makes it a better choice for dysmenorrhea [4]. Ibuprofen doses up to 3.2 g per day are safe for well-hydrated patients without renal insufficiency or a bleeding diathesis. For severe dysmenorrhea 800 mg every 6–8 hours is appropriate. In patients taking combined estrogen-progestin birth control pills, the bleeding that occurs during the placebo or pill-free period is not physiologic. It is the result of progestin withdrawal and can be minimized by the use of continuous hormonal contraception [5]. It is possible to resume active pill immediately, and even double the dose, to stabilize the endometrium and stop the bleeding. Our patient immediately received a heating pack and 800 mg of ibuprofen. Her pain improved within an hour, and was tolerable after another hour. She was discharged with instructions to start her next active pill pack immediately. Had her bleeding been heavier other interventions would have been considered, including higher doses of contraceptive pills, progestins, or antifibrinolytic agents (Table 3.1).

Prevention of future ED visits

Our patient was advised to follow-up with the doctor who prescribed her oral contraceptive pills to discuss switching from an extended cycle to a continuous regimen without pill-free periods. Other options can be discussed at that visit. In ambulatory management of patients with chronic pelvic pain and dysmenorrhea, the first step is to create therapeutic amenorrhea and ovarian suppression. Continuous hormonal contraception, gonadotropin-releasing hormone agonists, and danazol are highly effective treatments. The levonorgestrel intrauterine device (IUD) is also effective despite evidence it does not consistently suppress ovulation.

Patients taking opioid medication for chronic pelvic pain may also seek care in the ED for pain flares when they are not menstruating or ovulating. Avoiding these visits often requires the use by their prescriber of a treatment agreement that outlines the details of the doses of medications, the pharmacy filling the prescriptions, and requires that no other physician prescribe opioid medications for the patient. Patients who do not accept treatments to correct the underlying causes of pain or adjunctive treatments such as physical therapy, psychotherapy, or substance abuse counseling, can be dismissed from care. Before initiating opioid therapy, and periodically thereafter, it is important to screen patients for substance abuse using validated screening tools and, if indicated, with toxicology screening. In the United States, several states have established web-based prescription monitoring programs that collect all controlled substance prescriptions filled within their jurisdictions. Searches should be done at each office visit and ED visit to document patient adherence to their treatment agreements.

According to the US Centers for Disease Control and Prevention, between 2004 and 2008 the number of ED visits for nonmedical opioid procurement more than doubled. To

Table 3.1 Selected treatment options for acute dysmenorrhea

Treatment	Regimen
Continuous low-level topical heat	Apply heated patch to lower abdomen
NSAIDs:	
• Ibuprofen	Up to 2400 mg daily in divided doses
• Mefenamic acid	500 mg initial dose and then 250 mg every 6 h
If dysmenorrhea is accompanied by heavy menstrual bleeding	
Oral contraceptives	OCs containing 35 µg ethinyl estradiol (and any progestin) taken 2–4 times daily will usually stop bleeding within 48 h, and then taper to 1 pill daily. To avoid nausea use an anti-emetic such as promethazine 12.5–25.0 mg PR
Progestins:	
• MPA	MPA 10–20 mg BID
• NET	NET 5 mg 1–2 times daily
Transexamic acid (antifibrinolytic)	1300 mg TID (3900 mg daily) for up to 5 days until bleeding stops. Use if other treatments ineffective and patient not at increased risk for thrombosis

BID, two times daily; MPA, medroxyprogesterone acetate; NET, norethindrone; NSAIDs; non-steroidal anti-inflammatory drugs; OCs, oral contraceptives; PR, by rectum; TID, three times daily.

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Excerpt

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Case 3: Acute exacerbation of chronic pelvic pain in a 32-year-old woman

decrease the numbers of patients making repeated ED visits for pain, several hospitals have established case management programs. One such program included narcotic restriction, nonnarcotic treatment regimens, medication restriction to one pharmacy and one provider, and referral to primary care providers and addiction specialists. To be eligible, patients needed to demonstrate ED overuse or other signs of drug-seeking or drug addiction. ED overuse was defined as three or more visits per month, two or more visits per month for two consecutive months, or greater than six per year. Comparing the year prior to enrollment to the year after enrolment, ED visits dropped by 77%, from 3689 to 852 [6].

Key teaching points

- Women with chronic pelvic pain who have acute pain should be evaluated for specific causes and not dismissed as medication-seeking.

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CASE

4

A 19-year-old woman with diabetes and hypertension requiring emergency contraception

David Chelmow

History of present illness

A 19-year-old gravida 1, para 1 woman presents to your urgent care clinic with complaint of a torn condom the prior evening. She has regular cycles. Her last menstrual period began two weeks ago. She is in a stable relationship with a single partner. They are using condoms as their birth control method, although irregularly. She has diabetes and chronic hypertension.

Due to lack of insurance and her other medical problems, she has had difficulty obtaining effective contraception. With her prior episodes of birth control failure, she took over-the-counter emergency contraception pills. She has done this several times in the last year, but is both worried about pregnancy and frustrated with the cost. She reports she is working while her partner completes college, and she hopes to have another child when he is employed and they have insurance.

Physical examination

General appearance: Well-developed, well-nourished woman appearing frustrated but in no apparent distress

Vital signs:

Temperature: 37.0°C
Pulse: 95 beats/min
Blood pressure: 142/90 mmHg
Respiratory rate: 16 breaths/min
Oxygen saturation: 100% on room air

Abdomen: Soft, nontender

External genitalia: Unremarkable

Vagina: Unremarkable, scant discharge

Cervix: Parous, no mucopurulent discharge

Uterus: Anteverted, nontender, normal size, mobile

Adnexa: Nontender, without masses

Laboratory studies: Urine pregnancy test: Negative

How would you manage this patient?

The patient had inadequately protected intercourse at mid-cycle. She has had recurring episodes of unprotected sex and contraceptive failure. She has not completed childbearing. She needs both emergency contraception to prevent unwanted pregnancy at present, and long-acting reversible contraception (LARC) to prevent pregnancy until she is ready to conceive. A copper intrauterine device (IUD) would safely and effectively meet both these needs.

Emergency contraception

This patient clearly needs emergency contraception. She has had a contraceptive failure at midcycle, which can have as high as a 25% risk of pregnancy. There are multiple options for emergency contraception (Table 4.1) [1]. Despite her medical comorbidities, she could use any of the available forms of emergency contraception. Recommendations for emergency contraception are outlined by the Centers for Disease Control and Prevention (CDC) in their “US selected practice recommendations for contraceptive use, 2013” [2] and their “US medical eligibility criteria for contraception use, 2010” [3]. The CDC’s medical eligibility criteria are clear that, regardless of medical comorbidities, benefits likely exceed risks for each emergency contraceptive option, even use of combined (estrogen and progestin) hormonal contraception. This recommendation reflects the increased risks associated with continuing pregnancy in patients with comorbidities. Even with combined hormonal emergency contraception, the two doses required

Table 4.1 Options for emergency contraception

Option	Formulation
Progestin	Plan B One-Step® (1.5 mg levonorgestrel single dose)*
Ulipristal acetate	Ella® (ulipristal acetate 30 mg single dose up to 5 days after unprotected sex or birth control failure)
Combined oral contraceptives	One dose within 120 hours after unprotected intercourse and a second dose 12 hours after the first dose†
Copper intrauterine device (IUD)	ParaGard®

* Available over the counter to women over age 15 with proof of age. The package labeling states to use within 72 hours of unprotected sex, but it is still likely effective up to 120 hours.

† Per the Centers for Disease Control and Prevention’s “US medical eligibility criteria for contraceptive use, 2010” [3], the FDA declared the following 22 brands of oral contraceptives to be safe and effective for emergency contraception: Ogestrel® or Oval® (1 dose is 2 white pills); Levlen® or Nordette® (1 dose is 4 light-orange pills); Craseline®, Levora®, Low-Ogestrel®, Lo/Ovral®, or Quasence® (1 dose is 4 white pills); Tri-Levlen® or Triphasil® (1 dose is 4 yellow pills); Jolessa®, Portia®, Seasonale®, or Trivora® (1 dose is 4 pink pills); Seasonique® (1 dose is 4 light blue-green pills); Empresse® (1 dose is 4 orange pills); Alesse®, Lessina®, or Levite® (1 dose is 5 pink pills); Aviane® (1 dose is 5 orange pills); and Lutera® (1 dose is 5 white pills).