Is it a kidney stone or abdominal aortic aneurysm?

Signs and symptoms of these two conditions can be very much alike—but one disorder can be fatal if not treated promptly. Here’s what you need to know.

By Rosalyn Gendreau-Webb, RN, BSN

Consider these two patients who’ve arrived at the emergency department (ED):

- Paul Weeks, 30, is complaining of severe left flank pain that comes in waves and blood in his urine. The pain started when he was working at his home computer. On examination, Mr. Weeks is restless, pale, diaphoretic, and afebrile; his blood pressure (BP) and pulse are elevated. After further evaluation, Mr. Weeks is diagnosed with a kidney stone. He’s discharged home with an oral opioid analgesic and an anti-inflammatory drug, a referral to a urologist, and instructions to increase his oral fluid intake and strain all urine. He’s also told to return to the ED if his symptoms worsen.

- Bill Endicott, 65, is brought to the ED with symptoms that are seemingly identical to those of Mr. Weeks. After a thorough evaluation, however, a vascular surgeon is quickly contacted and Mr. Endicott is rushed into surgery. He’s been diagnosed with a dissecting abdominal aortic aneurysm (AAA) that needs immediate repair.

Two patients, two very different diagnoses—yet virtually identical signs and symptoms. In this article, I’ll take a closer look at the clinical clues and important information nurses need to know to distinguish between kidney stones and an expanding or dissecting AAA. (For more on symptoms, see Beware of similar symptoms.) I’ll also examine nursing considerations for both diagnoses.

KIDNEY STONES

Painful predicament

Although both men and women can develop kidney stones (calculi), the incidence is three times higher in men. High levels of calcium, oxalate, or uric acid in the urine and poor hydration (which leads to urine concentration) are the main factors contributing to kidney stone formation.

A patient with a kidney stone usually has a classic presentation of colic-like lower abdominal, unilateral flank, and groin pain. The patient may be extremely restless, pale, or lightheaded. Your immediate concerns should be to take his history and conduct a physical examination. Then you should address pain relief; hydrate the patient; draw blood for a complete blood count, checking the white cell count, hemoglobin, hematocrit, and platelets; and obtain a comprehensive metabolic panel to test electrolytes, blood urea nitrogen, and creatinine levels. Results will indicate renal function, presence of infection, or blood loss. You’ll also obtain urine for a urinalysis that will test for nitrates, leukocytes, and blood in the urine.

The health care provider will order a radiologic study to confirm that the patient has kidney stones. Today’s gold standard is noncontrast computed tomography (CT) scan. If your facility doesn’t have access to a CT scanner, X-ray of the kidneys, ureters, and bladder is considered accurate too. Because X-rays can’t be performed on pregnant women, they’ll probably undergo an ultrasound instead.

How aggressively the patient is treated will depend on whether the situation is an emergency because of factors such as obstruction, renal failure, or sepsis.

Pain management is the main priority for your patient before and after the diagnosis is confirmed. Commonly used pain medications are intravenous (I.V.) ketorolac, a nonsteroidal anti-inflammatory drug (NSAID), or morphine, an opioid analgesic; or oral NSAIDs, such as ibuprofen and naproxen. To control the nausea that can
occur with kidney stones, you may also give antiemetics, such as prochlorperazine.

Debate continues over how much fluid to give the patient with a kidney stone. Hydration is intended to flush the kidneys, moving the stone through the ureter into the bladder, where it can be passed through the urethra. However, there’s concern that a too-rapid I.V. infusion will increase pressure in the ureters, thus increasing pain. If the patient can drink fluids, oral hydration is preferred to reduce this risk. But if the patient can’t tolerate oral fluids because of nausea or vomiting, he needs I.V. hydration.

After a diagnosis is made, your patient will likely be discharged home. Before discharge, ensure that he understands his pain medication and has a referral for a urologic follow-up. Also, give him a strainer to use at home. Every time he voids, he should use the strainer to catch any passed stones, which are then tested for composition. Depending on the composition, he may need to modify his diet and lifestyle to help prevent future stones. For example, if the stone is primarily composed of calcium, he should reduce calcium intake, including calcium-containing supplements and antacids. If the stone is primarily composed of uric acid, he should reduce protein intake.

Most patients pass a kidney stone without intervention—unless it’s larger than 5 mm. Then the urologist has to remove it. How that’s done depends on the patient and the stone’s location. Lithotripsy, which uses shock waves to break up kidney stones, is the least invasive procedure and is performed on an outpatient basis. Some patients require a more invasive procedure, such as cystoscopy or ureteroscopy.

Finally, tell the patient to return to the ED if his prescribed medication doesn’t relieve the pain or if he experiences fever, chills, nausea, or vomiting. These are signs of pyelonephritis (kidney infection), usually from a blocked ureter. Fortunately, this complication is rare.

ABDOMINAL AORTIC ANEURYSM
Take action, stat!
An aortic aneurysm is the weakening and ballooning of the aorta wall. Aortic aneurysms can occur in the thoracic aorta or abdominal aorta (the focus of this article).

Men are more likely to have an AAA than women. Hypertension, smoking, high cholesterol, and some genetic abnormalities are among the predisposing factors.

Time is of the essence with a confirmed or suspected AAA: If the aneurysm ruptures, the patient will probably die within a short time unless he has immediate surgery. However, if surgery is performed as soon as the aneurysm is discovered, his chance of survival improves. Remember, the longer it takes to operate on the patient, the greater his risk of dying.

So, what do you need to look for when assessing a patient who might have an AAA? A pulsating abdominal mass is a giveaway. Trouble is, fewer than 40% of AAA patients have this cardinal sign. It’s more likely that your patient will experience back, abdominal, or flank pain; hematuria; nausea; or vomiting—signs and symptoms also caused by kidney stones.

In fact, renal colic and kidney stones are the leading misdiagnoses for a patient with a dissecting aortic aneurysm. And that could cost your patient his life.

Of course, even a rapid, correct diagnosis doesn’t guarantee your patient will survive: The mortality rate is
still almost 50% in patients who are quickly and accurately diagnosed with a dissecting or rupturing AAA.

Let’s not be hasty
The lesson to be learned is that even if a patient’s signs and symptoms signal a kidney stone, don’t jump to any conclusions. In a patient age 60 or older who’s never had a kidney stone, an AAA must be ruled out first.

Also, keep in mind that the urinalysis alone doesn’t tell the whole story—meaning you can’t conclude that the patient has a kidney stone just because he has hematuria. In one study, more than 87% of patients with an AAA also had hematuria.

So, what can you rely on? The same thing that tells you if a patient has a kidney stone: a CT scan. If an AAA is highly suspected but the patient is too unstable or can’t tolerate a CT scan because of pain, he may undergo a bedside ultrasound instead.

Your eagle eye
When she suspects an AAA, the health care provider will order multiple I.V. accesses, using large-caliber cannulas, and fluid resuscitation with 0.9% sodium chloride or lactated Ringer’s solution. Hang 0.9% sodium chloride on blood administration tubing so that you’ll be prepared if a transfusion is needed.

Monitor your patient closely for hypotension and tachycardia, which are signs of blood loss, and monitor his SpO2 and cardiac rhythm closely. Administer supplemental oxygen as ordered to maintain his SpO2 at greater than 94%.

Be vigilant about monitoring the patient’s BP. Many patients will become hypertensive as the vessels constrict to make up for the loss of volume. The higher the patient’s BP, the greater the pressure is inside his aorta and the greater the chance of further vessel dissection.

If your patient becomes hypertensive, alert the health care provider immediately. Expect an order for a beta-blocker, such as metoprolol, or a combination alpha-blocker and beta-blocker, such as labetalol, to be given I.V. in addition to nitroprusside. Nitroprusside dilates the vasculature; a beta-blocker is given with it to prevent reflex tachycardia. Metoprolol can be administered at a rate of 5 mg slow I.V. every 5 minutes as needed for desired effect. Labetalol is given at a rate of 10 mg I.V. over 2 minutes initially, and then repeated every 10 to 15 minutes until the patient’s BP is controlled. Nitroprusside reduces peripheral vascular resistance and is initiated at a rate of 0.1 mcg/kg/minute and titrated upwards every 3 to 5 minutes. Be careful: Cyanide toxicity is a risk with nitroprusside doses greater than 4 mcg/kg/minute or prolonged infusions.

As you administer these drugs, be sure to monitor the patient’s BP and cardiac rhythm. He’s at increased risk for a myocardial infarction, so monitor for signs and symptoms of cardiac ischemia. And don’t forget that any opioid analgesics you’re giving can also lower BP. The goal is to maintain a BP that sustains cerebral and renal perfusion. Alert the health care provider if the systolic pressure falls below 80 mm Hg.

Assess your patient’s abdomen for firmness or distention and signs of bleeding into the peritoneal cavity. You’ll most likely note hypoactive or absent bowel sounds. Re-assess this frequently.

Quick thinking, quicker actions
If the CT scan reveals an AAA, quickly move your patient to the operating room. If your facility can’t handle this type of surgery, be prepared to transfer him to a hospital that can. Also transfer your patient if your facility doesn’t have CT capabilities and an AAA is strongly suspected.

Quick thinking and quicker actions can mean the difference between life and death for a patient with an AAA.

SELECTED REFERENCES

Rosalyn Gendreau-Webb is an emergency room staff nurse at Mercy Hospital in Portland, Maine.


Beware of similar symptoms
Common signs and symptoms of kidney stone
• Hematuria
• Severe colicky flank pain
• Nausea and vomiting
• Severe colicky back pain
• Hypertension

Common signs and symptoms of rupturing or dissecting abdominal aortic aneurysm
• Hematuria
• Severe flank pain
• Abdominal pulsating mass
• Severe abdominal pain
• Severe back pain
• Hypertension
• Syncope
• Shock (late sign)