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Nephrolithiasis; Valvular Cardiac Disease

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Chapter 1—Nephrolithiasis

Brian S. Rifkin, MD, and Richard J. Simons, MD, FACP

I. INTRODUCTION

The incidence of nephrolithiasis appears to be on the rise, and it has been increasing in developed countries throughout the 20th century. Diet, an aging population, and the use of certain medications are all likely contributing factors to the increasing incidence, although the exact cause is not known. Kidney stones now account for 5 to 10:1000 of all hospital admissions. The overall lifetime risk is 3% to 5% in the United States. By age 70 years, 12% of men and 5% of women will develop a symptomatic stone; children also can develop kidney stones. Several predisposing risk factors (Table 1) for stone development may increase stone prevalence to as high as 25% to 30% in some populations.¹

The natural history of kidney stone formation is marked by recurrence. Nearly 50% of patients will have a recurrence after 5 years, and 66% will have a recurrence after 9 years.² More than 15 different etiologic categories of nephrolithiasis exist, making a thorough workup seem daunting. Unfortunately, a single underlying etiology is found in only a few patients and more than 60% of patients have a multifactorial cause.³ It is important to complete a focused and cost-effective evaluation of patients with kidney stones. Diagnostic evaluation and selective treatment of metabolic abnormalities clearly decrease the incidence of new stone formation. Two case patients are presented to highlight the management of patients with nephrolithiasis.

II. CASE PATIENT I

INITIAL PRESENTATION

Patient 1 is a 35-year-old man who presents to the emergency department for sudden onset of nausea, vomiting, and gross hematuria. Physical examination reveals that patient 1 is obese (220 lb at 5 ft 8 in) and hypertensive, with blood pressure of 150/90 mm Hg. He has right flank tenderness without rebounding or guarding. On further questioning, he also admits to urinary frequency and dysuria. The patient notes no pro-

drome or precipitating event. He appears uncomfortable and is unable to sit in any one position for a prolonged period of time. He describes a sharp pain that “comes in waves,” is not changed with position, and extends from his right inguinal region to the tip of his penis. The patient reports that he does not have a personal or family history of kidney stones. He is given intravenous (IV) fluids and meperidine for pain.

- **What would be the appropriate initial workup for this patient?**
 - A) Serum BUN and creatinine levels
 - B) Serum calcium, phosphorus, and uric acid levels
 - C) Complete blood count (CBC) with differential
 - D) Urinalysis and culture
 - E) All of the above

DISCUSSION

The correct answer is E. This patient’s history strongly suggests the presence of a kidney stone. The 1999 National Institutes of Health (NIH) consensus conference set guidelines for evaluation of a patient with a suspected first episode of nephrolithiasis (Table 2).^{4,5} The evaluation should contain pertinent history (including family, occupational, and dietary history), a list of current medications, and any history of kidney stones or predisposing conditions (eg, Crohn’s disease). Supporting laboratory tests also are recommended. Therefore, testing should include all the items previously listed. Other laboratory tests may be indicated depending on findings of the initial testing, the type and severity of the stone, and the presence of a systemic disorder that would predispose to recurrent stones.

The differential diagnosis in a male patient may include common genitourinary infections, including epididymitis or prostatitis. In a female patient, ovarian torsion or an ovarian cyst may have a similar presentation of excruciating lower abdominal pain, nausea, and vomiting. Other emergent disorders, including testicular torsion in men and ectopic pregnancy in women, also should be considered in the initial workup depending on supporting information in the history and on physical examination. Infectious and catastrophic abdominal

Chapter 2—Valvular Cardiac Disease

Richard J. Simons, MD, FACP, and C. Randy Hubbard, MD

I. INTRODUCTION

Valvular heart disease is an important topic in cardiology and internal medicine, especially with the increasing age of the population. The field has made major advances in the past 15 to 20 years, largely due to improved methods of noninvasive assessment of valvular as well as ventricular function. There also have been advances in treatments, both surgical and medical, leading to less morbidity and mortality than in the past. In this article, common presentations, physical examination findings, and diagnostic and therapeutic strategies will be highlighted.

II. AORTIC STENOSIS

CASE 3—INITIAL PRESENTATION

A 64-year-old man presents for his annual physical examination. He is in good health and is very active, running his own company and travelling extensively. He recently returned from a 2-week hiking and camping trip. He denies any complaints on review of systems. On physical examination, a grade 3/6 systolic ejection murmur is noted at the right upper sternal border. There is a soft S_2 . An echocardiogram is obtained, which shows aortic stenosis with a valve area of 0.8 cm^2 and a transvalvular gradient of 40 mm Hg.

- Which of the following is appropriate for managing this patient?
 - A) Schedule cardiac catheterization to assess for coronary disease prior to valve replacement
 - B) Refer to cardiothoracic surgeon for valve replacement
 - C) Watchful waiting
 - D) 24-hour Holter monitoring to evaluate for arrhythmia

DISCUSSION

The best answer is C. Aortic stenosis is one of the most common valvular lesions in the United States. Between 1% and 2% of the population are born with a

bicuspid aortic valve, which is more prone to stenosis than are tricuspid valves. There is evidence that some of the same risk factors that predispose to coronary atherosclerosis (ie, hypertension, hyperlipidemia, and inflammation) (Table 5) may play a role in aortic stenosis as well. A characteristic murmur and a diminished or absent S_2 , even in the absence of symptoms, should prompt an echocardiographic evaluation.¹⁻³

In patients with symptomatic aortic stenosis, there is strong evidence that valve replacement surgery prolongs survival.⁴⁻⁶ However, the course is less clear in asymptomatic patients with severe stenosis. It is estimated that 1% to 2% of patients with severe asymptomatic aortic stenosis will have sudden death or rapid progression to severe symptomatic disease.^{4,5,7} The perioperative mortality rate is about 1% for aortic valve surgery.^{8,9} Several studies have compared early surgical intervention with watchful waiting. These studies show that it is generally safe to delay surgery until symptoms develop.^{4,7,10,11}

Some suggest that serial echocardiography may be helpful to assist in earlier identification of patients who may require surgery for worsening stenosis and increasing left ventricular hypertrophy. Concentric hypertrophy is the normal adaptive response to stenosis. The hypertrophied myocardium has higher oxygen demands and aortic stenosis can diminish coronary blood flow, which can in turn lead to both systolic and diastolic dysfunction.⁴

Stress testing is contraindicated in patients with symptomatic disease. In asymptomatic patients, stress testing under close physician supervision may be done. Testing may demonstrate symptoms that had not been previously noted by the patient. In one study, 21 of 58 patients developed symptoms for the first time during stress testing.¹² This test may help to identify patients earlier who may benefit from surgical intervention.^{2,4,13}

CASE 3—FOLLOW-UP

The patient returns 8 months later. He has had progressive shortness of breath, orthopnea, paroxysmal nocturnal dyspnea, and lower extremity edema. He reports chest pain with exertion.

- What is the next most appropriate step in this patient's management?