



Trauma and reconstruction

An 82-year-old female with chest pain radiating to the back and flank

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ARTICLE INFO

Keywords:

Bochdalek hernia
Extra-renal pelvis
Ureteral obstruction

ABSTRACT

An 82 year-old female presents with severe, sharp right-sided chest, shoulder and flank pain, worse with deep inspiration. Cardiac workup is negative for myocardial ischemia or aortic dissection. Computed tomography demonstrates a right posterior diaphragmatic (Bochdalek) hernia, involving the right extra-renal pelvis and proximal ureter, with an associated delayed nephrogram and mild hydronephrosis. There is no obstructing nephrolithiasis. The patient is taken to the operating room and right-sided double-J ureteral stent is placed (Fig. 1), with immediate resolution of pain. Diaphragmatic hernia repair in coordination with urology and general surgery is scheduled.

Introduction

The differential diagnosis for chest pain is broad, ranging from musculoskeletal, cardiovascular, upper gastrointestinal. The initial management should involve the evaluation of etiologies with the greatest risk of morbidity and mortality. In patients who complain of pain radiating to the back or flank, renal and ureteral etiologies of the pain should also be included on the differential diagnosis, a focused genitourinary examination should be performed, and relevant imaging should be obtained. Herein, we describe a case of a right-sided renal pelvis that herniated into the ipsilateral chest, causing proximal renal obstruction and renal colic.

Case presentation

An 82-year-old female with hypertension, diabetes, and prior cystocele repair presents with one day of severe, sharp right-sided chest and shoulder pain referring to the back and flank, markedly worse with deep inspiration. Cardiac workup, including computed tomography angiography, is negative for myocardial ischemia or aortic dissection; however, a right posterior diaphragmatic (Bochdalek) hernia is detected. The patient is afebrile, but does have leukocytosis (15.2 K/ μ L). Urinalysis is negative. There is no evidence of acute kidney injury. Abdominal imaging with contrast is obtained. A right posterior Bochdalek hernia is confirmed, measuring 5.4 \times 8.2 \times 6.9 cm, containing fat and a portion of the right extra-renal pelvis and proximal ureter, with an associated delayed nephrogram and mild hydronephrosis (Fig. 1, Video 1). There is no evidence of ureteral dilatation distal to the hernia. There are

scattered punctate subcapsular calcifications of the right kidney but no evidence of obstructing nephrolithiasis. The patient is taken to the operating room and right-sided double-J ureteral stent is placed, which resolves the patient's pain. General surgery is consulted and outpatient repair is recommended. The patient is discharged with follow-up for diaphragmatic hernia repair by urology and general surgery.

Supplementary video related to this article can be found at <https://doi.org/10.1016/j.eucr.2020.101220>.

Discussion

First described by anatomist Vincent Alexander Bochdalek in 1848, a Bochdalek hernia results from a defect of the posterolateral diaphragm, which is the last portion of the diaphragm to close during embryonic development, resulting in herniation of intrabdominal contents into the chest. Most-commonly, it presents in newborns, and is a severe birth defect, with high rates of neonatal mortality. Most commonly affecting the left hemi-diaphragm, it can cause respiratory distress, cyanosis, tachycardia and ipsilateral enlargement of the thoracic cavity.¹ Cases in the literature have centered on the pediatric population, and have described intrathoracic herniation of the small bowel, spleen, stomach, colon, the left lobe of the liver, and rarely the entire left kidney.² Intrathoracic displacement of the kidney and/or upper tract are rare, but can result in renal colic secondary to ureteral obstruction, urinary tract infection, impaired renal function, proteinuria, and hypertension.³ The diagnosis of a Bochdalek hernia in an adult is rare, and few case reports exist in the literature. Patients may present with a myriad of abdominal and chest complaints, and the herniated contents may become

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<https://doi.org/10.1016/j.eucr.2020.101220>

Received 13 April 2020; Received in revised form 20 April 2020; Accepted 21 April 2020

Available online 4 May 2020

2214-4420/© 2020 The Author(s).

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Fig. 1. Reconstructed computed tomography with delayed phase imaging demonstrating a right sided diaphragmatic hernia with involvement of the ipsilateral renal pelvis and ureter.

strangulated, requiring emergent surgical intervention. Thoracic displacement of the kidney, renal pelvis, or ureter, alone do not necessitate intervention unless the patient is clinically symptomatic. Even in the few reports of incidentally discovered adult thoracic kidneys, surgical intervention is not necessary unless there are associated complications.⁴ In the current case, though only the renal pelvis had herniated, there was considerable renal colic, associated hydronephrosis and a delayed nephrogram, suggesting an acute obstruction necessitating intervention. The renal pelvis and ureter were able to be re-aligned and brought out of the hernia through endoscopic manipulation, and a double-J ureteral stent was placed to provide a measure of security

against re-herniation and repeat ureteral obstruction, until the patient could be scheduled for diaphragmatic hernia repair.

Conclusion

Though the differential diagnosis for chest pain is broad, any associated radiation to the back or flank should increase suspicion for renal or ureteral involvement and prompt a basic evaluation of those organs through a focused genitourinary examination and relevant imaging. Herein, the workup and initial management of a patient with sudden onset chest pain and right renal colic revealed displacement of the right renal pelvis through a Bochdalek (posterolateral diaphragmatic) hernia. The clinical presentation, associated hydronephrosis and delayed nephrogram prompted endoscopic intervention to alleviate the resultant obstruction.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of competing interest

No disclosures.

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