Abdominal Radiology (2019) 44:1946–1948
https://doi.org/10.1007/s00261-019-01909-4

CLASSICS IN ABDOMINAL RADIOLOGY

"Giant" hydronephrosis

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Published online: 16 April 2019

"Giant" hydronephrosis (GH) is variably defined as a kidney containing greater than 1000 ml of urine in its collecting system, or a kidney that accounts for more than 1.6% of total body weight [1, 2]. More than 600 cases of GH have been reported worldwide [3]. Radiologic imaging descriptions include an enlarged hydronephrotic kidney crossing the midline or occupying the entire hemiabdomen and extending for a length of five vertebral bodies or more [1]. Ultrasonography is often the first line of imaging (Fig. 1), and it may be followed by CT and MRI for better characterization of the process (Fig. 2).

GH is most commonly reported in children and rarely in adults [3]. The most common congenital cause of GH is ureteropelvic junction (UPJ) obstruction. Less commonly, ureteral ectopia, duplicated collecting system and aberrant vasculature causing extrinsic compression of the UPJ may produce GH [3]. Acquired causes include ureteral calculus, trauma, ischemia, carcinoma, and retroperitoneal fibrosis [3, 4]. Patients may be relatively asymptomatic, or present with symptoms of flank pain, chronic back pain, hematuria, protuberant abdominal mass, urinary tract infections, pyelonephritis and renal dysfunction [2–4]. Potential complications of long-standing GH include renal failure, hypertension, malignant transformation and rupture [2].

GH in the adult often leads to differential diagnostic confusion with other large cystic masses in the abdomen including intraperitoneal or retroperitoneal cysts, pseudomyxoma, pancreatic pseudocysts, ovarian cysts or renal tumors [3]. Once a diagnosis of GH is entertained, a renal 99m-Technetium mercaptoacetyltriglycine scan can be performed to assess renal function as the treatment plan relies on residual renal function and severity of symptoms [5]. Treatment includes nephrectomy in patients with severe symptoms and poor renal function [3]. Open or laparoscopic pyeloplasty may be considered in patients with substantial functioning renal parenchyma [5]. Although not a common diagnosis in adults, GH is an entity that radiologists should be familiar with to aid in treatment selection and avoid misdiagnosis (Fig 3).

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Fig. 1 Longitudinal gray-scale ultrasound image in a 90-year-old woman who presented to the ED with abdominal pain and worsening of chronic back pain following an episode of orthostatic hypotension that resulted in a fall, revealed a large 31 × 21 cm, multicystic mass containing internal echoes and debris. The cysts appeared to be communicating with each other and the left kidney was not separately visualized

Fig. 2 Contrast enhanced, reconstructed coronal CT image of the same patient revealed a grossly hydronephrotic left kidney extending from the left renal fossa into the central anatomic pelvis with no functional renal parenchyma seen. The patient subsequently underwent percutaneous nephrostomy drainage of more than a liter of rust colored fluid. The patient's symptoms were relieved and she was discharged following drain placement

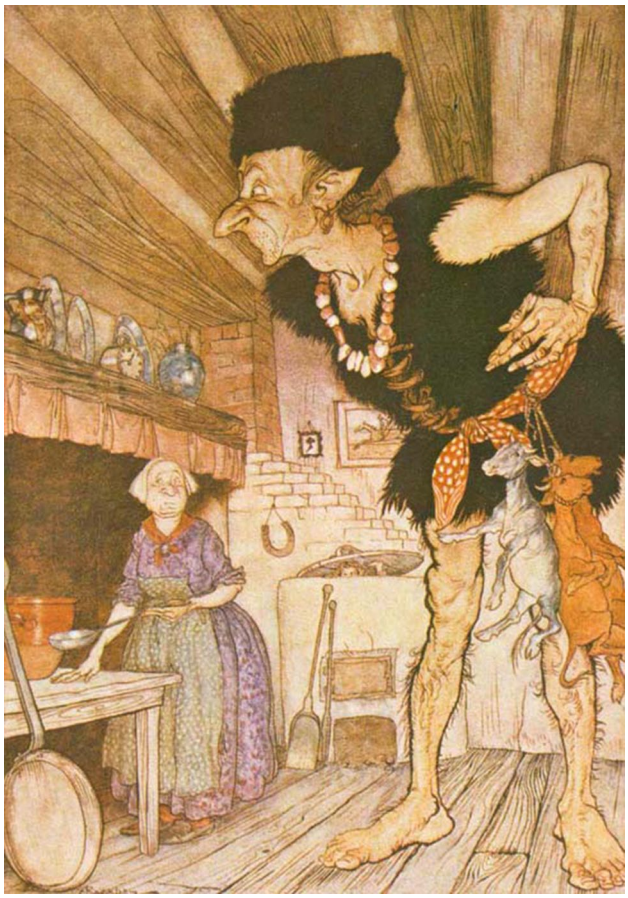

Fig. 3 An illustration depicting the giant from the fairy tale, "Jack and the Beanstalk". Perhaps his left hand is clutching his left flank (and some cows) due to "giant" hydronephrosis! (https://commons.wikimedia.org/wiki/File:Jack_and_the_Beanstalk_Giant_-_Project_Gutenberg_eText_17034.jpg), accessed October 19, 2018 (public domain)

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Research involving human and animal rights This article does not contain any studies with human participants or animals performed by any of the authors.

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