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Brief Report

URACHAL REMNANTS IN PATIENTS PRESENTING TO THE EMERGENCY DEPARTMENT WITH ABDOMINAL PAIN

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Abstract—Background: Rare causes of abdominal pain include abnormalities of the urachus, including patent urachus and urachal cyst with or without infection. However, reviews discussing etiology of abdominal pain, even in children, may completely omit mention of urachal remnants. **Objectives:** Determine the incidence of symptomatic urachal remnants in patients presenting to the emergency department (ED), including common presenting findings and method of diagnosis. **Methods:** A retrospective chart review was performed of all patients presenting to the ED with abdominal pain who were diagnosed with urachal remnants, including patent urachus or urachal cyst or abscess over a period of 11 years and 7 months in one hospital. **Results:** There were a total of 833,317 ED visits over the time period of the chart review, with 76,954 patients or 9.2% presenting with a complaint of abdominal pain. Twenty-four patients were identified, or 0.03% of those presenting with abdominal pain. Ages ranged from 16 days to 59 years. Among those 18 years or older, there was a male-to-female ratio of 1:1 of 14 patients. Thirteen patients (54.2%) initially presented with drainage from the umbilicus. **Conclusions:** Although rare, symptomatic disorders of urachal remnants may present at any age. These disorders should be kept in mind by the emergency physician among the broad list of differential diagnoses accounting for abdominal pain. Urachal cyst and abscess may present with or without drainage from the umbilicus. Drainage from the umbilicus is highly suggestive, but not pathognomonic, of a urachal anomaly, and patients should be imaged to make a definite diagnosis and assist in the management plan. © 2018 Elsevier Inc. All rights reserved.

Keywords—abdominal pain; urachal cyst; urachal abscess

INTRODUCTION

Abdominal pain is one of the most common symptoms precipitating evaluation in the emergency department (ED). The causes of abdominal pain are manifold. The diagnostic approach to abdominal pain may divide different etiologies by anatomic region or by age of presentation. Rare causes of abdominal pain include abnormalities of the urachus, including patent urachus and urachal cyst with or without infection. The urachus is a fibrous remnant of the cloaca that communicates between the bladder and umbilicus. This structure usually involutes after birth, forming the median umbilical ligament. The embryology and anatomy of urachal remnants has been reviewed recently (1,2). During the neonatal period, drainage from the umbilicus is suggestive of a patent urachus. However, urachal anomalies are rare after the neonatal period, with an estimated incidence of 1.6% in children under 15 years of age and in 0.063% of adults (3). However, reviews discussing etiology of abdominal pain, even in children, may completely omit mention of urachal remnants (4–6). This author encountered two young adults over a 3-year period who presented to the ED for evaluation of abdominal pain

who were diagnosed with urachal cyst. This prompted several questions: What is the incidence of symptomatic urachal remnants? Up to what age may symptomatic urachal remnants present? To answer these questions, a retrospective chart review was conducted of all patients presenting to the ED with abdominal pain who were diagnosed with urachal remnants, including patent urachus or urachal cyst or abscess over a period of 11 years and 7 months in one hospital.

METHODS

We obtained approval from the institutional review board for retrospective chart review and data analysis. The hospital is a suburban, community hospital, not an academic or referral center. One emergency physician conducted the chart review. Data sources included the emergency physician note, specialist notes, pathology reports, radiology imaging reports, and laboratory results. We used a data table to target extraction of information, but a standardized abstraction form was not used. The electronic medical records were searched from February 21, 2006 to September 20, 2017 for total visits to the ED, visits presenting with abdominal pain, and visits with a diagnosis of urachal cyst or abscess. The starting date of the search coincided with the adoption of electronic medical records. International Classification of Diseases, Ninth Revision code 753.7, covering anomalies of the urachus, urachal cyst, and urachal abscess; and International Classification of Diseases, Tenth Revision codes Q64.4 for malformation of urachus, urachal cyst, and patent urachus; L02.216 for cutaneous abscess of the umbilicus; and R19.05 for periumbilical swelling, mass, or lump, were used as search criteria. Inclusion criteria were patients whose charts were coded with a diagnosis of urachal cyst or abscess as of completion of the patient chart at any time from presentation to the ED until discharge from the hospital. Thus, diagnoses of urachal remnants might have been made before the patient presented to the ED or after the patient left the ED, based on further work-up or based on pathology findings from laparoscopy. Exclusion criteria were patients whose medical records did not support a diagnosis of urachal cyst or abscess. We did not obtain specific patient or parental consent because all identifying personal information was removed from the report.

RESULTS

During the 139-month interval, there were a total of 833,317 visits to the ED for an average of 71,943 visits per year. Of these visits, 76,954 patients presented with a complaint of abdominal pain or 9.2% of total visits; 34 charts were identified. One case was excluded that

did not have a urachal cyst but had surgery for umbilical hernia. Three cases were excluded that had a superficial umbilical abscess or cellulitis that apparently did not involve a urachal remnant. However, of note, several of these patients did present with drainage from the umbilicus. Two patients were excluded who had neoplasia that did not derive from urachal remnants. An additional case was also excluded that had peritoneal abscesses of unclear etiology. Three cases were excluded because there was insufficient documentation of patients' work-up or diagnosis that could be identified in the medical record. Six patients were not seen by emergency physicians, but were seen directly by the pediatric surgeon. However, these patients were included for analysis. In another hospital, or under different circumstances in this hospital, it is possible that these patients would have been seen by the emergency physician.

We identified 24 patients with urachal cyst or abscess (see collected data in [Table 1](#)). In the Table, "prior visits" refers to visits to the ED. Many patients were previously seen by their primary physician prior to evaluation in the ED. Several patients had neither abdominal pain nor tenderness, but presented with swelling of or discharge from the umbilicus. The 24 patients represent a rate of 0.03% of patients with abdominal pain. The ages ranged from 16 days to 59 years, with an average age of presentation of 20.1 years. Examination of the ages reveals what appears to be a trimodal distribution, with a cluster in the neonatal/infant period, a second cluster in the late teens/early 20s, and a later cluster in the mid 50s (see [Figure 1](#)). Fourteen were male and 10 were female, for a 1.4:1 ratio. Among those 18 years or older, there was a male-to-female ratio of 1:1 of 14 patients. Thirteen of 24 patients (54.2%) initially presented with drainage from the umbilicus; 17 of 24 patients (70.8%) required operative repair of the urachal remnant/abscess.

DISCUSSION

Abdominal pain is an extremely common symptom and accounted for nearly 10% of all ED visits during the study period. Symptomatic urachal remnants are a small fraction of this group. The incidence of urachal remnants in this review was only 0.03% of patients presenting with abdominal pain. Asymptomatic urachal remnants may be more common, but this review focused only on symptomatic cases that require diagnosis and differentiation from other causes of abdominal pain (7). Previously published rates of urachal remnants suggested a prevalence of 1–1.6% of the general pediatric population, and less in the adult population (3). The discrepancy in the previously published rates and the rate observed in this study most likely represents the difference between asymptomatic vs. symptomatic presentation. However, because this

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