

## Urachal Inflammatory Mass Mimicking an Intra-Abdominal Tumor Two Years after Excision of the Urachal Sinus in a Child

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A 2-year-and-2-month-old boy presented with a tender fist-sized mass in the lower abdomen for 3 days. Turbid urine was also a complaint. His urachal sinus and umbilicus had been removed at the age of 2 months. Abdominal ultrasonography and computed tomography revealed a tumor mass beneath the lower abdominal wall. Total excision of the mass was performed. Microscopic examination showed an abscess located next to a small urachal remnant without stitches or foreign body reaction. To our knowledge, an urachal inflammatory mass mimicking an intra-abdominal tumor after excision of the urachal sinus, especially in children, is very rare. The factors causing such an urachal mass are discussed. (*Chang Gung Med J* 2003;26:598-601)

**Key words:** urachus, tumor, children.

The urachus is a normal remnant located between the bladder and the umbilicus, which exists as a narrow cord. After infection, umbilical discharge and abdominal pain with an associated mass are the most common presentations. Clinical diagnosis can thus be made in a majority of patients. Preoperative ultrasonography and computed tomography scan are helpful in suspected cases. Usually an urachal sinus can be treated by radical resection. Rarely the cyst perforates the peritoneal cavity causing peritonitis mimicking an abdominal mass. An urachal abscess presenting as an abdominal mass after excision of the urachal sinus is very unusual. Herein, we report on such a case and emphasize that an urachal abscess may present as an intra-abdominal tumor mass 2 years after the operation.

### CASE REPORT

A 2-year-and-2-month-old boy presented with 3 days of fever and a tender fist-sized mass in the

lower abdomen. Turbid urine was also a complaint, but there was no umbilical area discharge. There was no history of hereditary or familial diseases. He had received removal of the urachal sinus with the umbilicus at the age of 2 months.

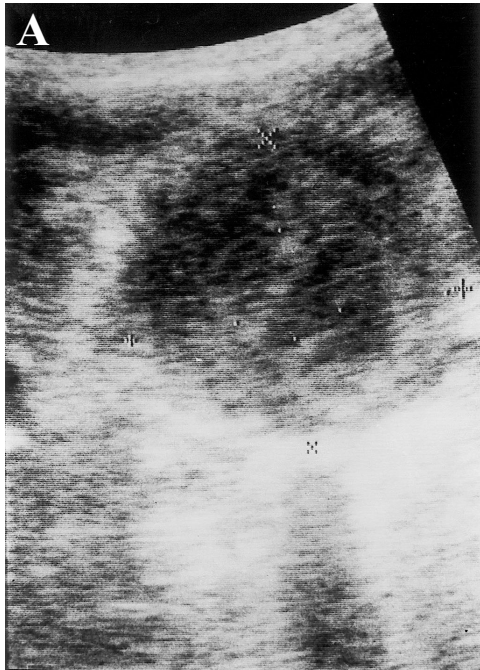
On physical examination, the abdomen was soft without erythema or heat. But a 3 × 4 cm, firm, fixed mass was palpable in the lower abdomen with tenderness. Laboratory tests revealed marked leukocytosis of 24,000/mm<sup>3</sup> and slightly elevated C-reactive protein (16.4 mg/L; normal value <5 mg/L). Urinalysis showed occult blood (2+) and increased white blood cells (>100/high-power field). Urine culture grew *Escherichia coli* (>10<sup>5</sup> colony count/ml). Blood urea nitrogen and serum creatinine were within normal values. The chest and plain abdomen X-ray films were unremarkable.

Abdominal ultrasonography and computed tomography demonstrated a large heterogeneous solid tumor mass in the lower abdomen, just beneath the abdominal wall (Fig. 1A, B). Thus total excision

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**Fig. 1** (A) Abdominal ultrasonography showing a large heterogeneous solid mass just beneath the lower abdominal wall. (B) Abdominal computed tomography showing a large upper pelvic mass. It is a pelvic extraperitoneal mass with inward protrusion and compression of the sigmoid.

of the solid mass was performed. During the operation, an inflammatory mass extending from the dome of the urinary bladder to the umbilicus was noted, and which contained a small amount of purulent material. The mass had a pale-gray, non-broken outer surface. Microscopic examination revealed an abscess surrounded by granulation tissue with dense infiltration of neutrophils. No stitch material was found. Only a small remnant of the urachus with a transitional epithelial wall next to the abscess was noted (Fig. 2). The patient remained well 12 months after surgery.



**Fig. 2** Microscopic examination revealing granulation tissue with dense infiltration of neutrophils. A remnant of the urachus (arrow) next to the abscess can be noted. (H&E, X50)

## DISCUSSION

The urachus, which develops from the apex of the ventral cloaca, is a normal embryonic remnant that usually persists as a narrow cord connecting the urinary bladder and umbilicus. The urachus consists of a 3-layered structure of transitional cell epithelium, connective tissue, and an outer muscle layer.<sup>(1)</sup> It may remain uninfected and present as a smooth intumescence in the anterior abdominal wall between the umbilicus and symphysis. Urachal disease usually occurs by formation of a sinus with mucinous secretion.<sup>(1)</sup> If it becomes infected, the route of infection is via the umbilicus.<sup>(2)</sup> The most common presentations are umbilical discharge and abdominal pain with an associated mass.<sup>(1-4)</sup> In the case of acute lower abdominal pain concomitant with urinary tract infection without umbilical swelling or discharge after umbilicus removal 2 years previous should suggest the possibility of urachal infection. As we know, urinary tract infection generates back pressure and may lead to further dilatation of the terminal part of the urachus.

Infection of the urachus may spontaneously perforate, localized or diffuse peritonitis, sometimes fatal, has been reported.<sup>(1)</sup> Clinically and preoperatively, an urachal abscess must be differentiated from an infected ovarian cyst, Meckel's diverticulitis, and acute appendicitis.<sup>(3)</sup> Early diagnosis and resection of non-infected urachal disease are important.

Diagnosis of a patent sinus tract by cystoscopy has been described.<sup>(5)</sup> Vesicoureterography may be useful in demonstrating an alternating sinus or remnant urachal tract.<sup>(6)</sup> But, the role of cystoscopy and vesicoureterography in diagnosing an urachal abscess remains unclear.

Ultrasound examination and computed tomographic (CT) scan of the lower abdomen are useful tools for establishing a diagnosis, especially in showing the relationship between the urachus and the urinary bladder or umbilicus.<sup>(7,8)</sup> Echogenic cystic tumors and thickened tubular structures within the anterior abdominal wall are highly diagnostic ultrasound findings.<sup>(7,8)</sup> Infection can be diagnosed if the umbilical cord remnant is larger than expected, or if anechoic, echogenic, or flocculent fluid is seen within the lumen. Gas echoes interspersed in the fluid within the internal or external umbilical cord remnants support a diagnosis of anaerobic suppuration.<sup>(9)</sup> Although ultrasound and CT are efficient for evaluating the margin of inflammation for surgery,<sup>(10)</sup> when the inflammation is severe, they occasionally contribute to the misdiagnosis of a tumor.<sup>(10)</sup> Our case masqueraded as an intra-abdominal tumor mass on ultrasound and CT, as it was located extraperitoneally in the pelvis with inward protrusion and compression of the sigmoid which is an unusual presentation.

Urachal neoplasms are very rare tumors, representing 0.5% of all bladder cancers.<sup>(11)</sup> They are more common in middle-aged and elderly populations.<sup>(12)</sup> Seventy-five percent of urachal neoplasms in patients younger than 20 years old are sarcomas.<sup>(13)</sup> When an intra-abdominal tumor mass is found on ultrasound and CT and a sarcoma is suspected, surgical debulking is important.<sup>(10)</sup> In this particular patient, as the imaging presentation indicated that it was more likely a sarcoma rather than an inflammatory mass, surgery was undertaken.

Affected children should routinely undergo an investigation for associated genitourinary anomalies.<sup>(2)</sup> Urine routine analysis should be conducted since retrograde infection from the urinary bladder to the urachal tract is possible. We also suggest that the urachus should be removed as close to the bladder dome as possible.

In conclusion, a urachal abscess should be considered in a child with lower abdominal pain or signs of urinary tract infection. All affected children should be routinely followed up for years because complications may occur late. A urachal abscess may mimic an intra-abdominal tumor mass on ultrasound and CT.

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## 臍尿管瘻管切除兩年後以腹腔腫瘤表現的兒童臍尿管發炎

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一位兩歲兩個月大的小男孩，下腹部被摸到拳頭般大小的腫瘤已經有三天，亦被發現有膿尿的現象，他在兩個月大的時候已經接受過臍尿管瘻管的切除手術，如今腹部超音波及電腦斷層均顯示腹內有腫瘤，所以他又接受腫瘤的全切除手術，顯微鏡檢查發現在小臍尿管殘餘遺跡的旁邊有一膿瘍，但並沒有發現線頭或異物的存在。據我們所知，臍尿管發炎在臍尿管瘻管切除兩年後以腹腔腫瘤來表現，尤其在兒童，是非常罕見的病例，我們將深入探討其可能造成的原因。(長庚醫誌 2003;26:598-601)

**關鍵字：** 臍尿管，腫瘤，兒童。

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