

# Ultrasound of Urachal Anomalies in Children: A Pictorial Essay

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## Introduction

The urachus connects the dome of the bladder to the umbilical cord in foetal life. This connection usually involutes at birth. Urachal anomalies occur when the urachus persists beyond birth. These anomalies may cause severe morbidity and mortality due to complications such as infection and malignancy. These anomalies often present in childhood and ultrasound is often the first and only modality needed to diagnose these lesions. The purpose of this poster is to illustrate the sonographic features of these anomalies and their complications.

## (B) Urachal Cyst

The urachal cyst is a fluid-filled dilatation of the mid-urachus. They form when the umbilical and vesical ends of the urachal lumen close while an intervening portion remains patent and fluid-filled. Urachal cysts are usually asymptomatic until they become infected. If left untreated they may rupture and cause peritonitis or drain through the umbilicus or cause urinary tract infection. Rarely, calculi or adenocarcinoma may develop.



**Figure 3: Urachal Cyst.** 8-week old boy with inflamed umbilicus. Sagittal image shows a cyst (within the cursors) within the remnant urachus.

## (C) Umbilical-urachal Sinus

This is a non-communicating dilatation of the urachus at the umbilical end. It may be complicated by infection and rarely by tumour.



**Figure 4: Umbilical-urachal Sinus**

6-week old girl with inflamed umbilicus. Sagittal image shows a sinus containing low level internal echoes (red arrows) communicating with the umbilicus. The rest of the urachus is closed.

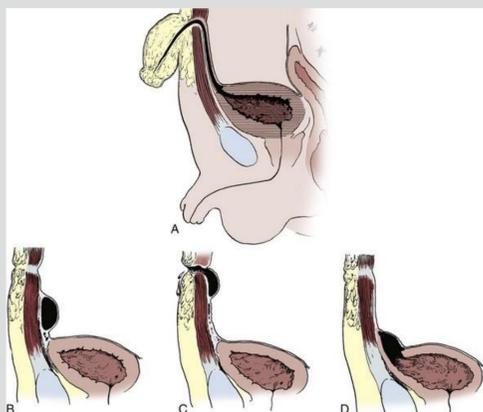
## (D) Vesico-urachal Remnant

This is the proximal equivalent of the urachal umbilical sinus due to failure of the urachus to close at the anterior-superior aspect of the bladder. There is no communication with the umbilicus. On imaging, a urine-filled outpouching is seen from the bladder.

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**Figure 5: Vesico-urachal Remnant**

6-week old girl with UTI. Sagittal image shows a urine filled outpouching from the anterior-superior end of the bladder.



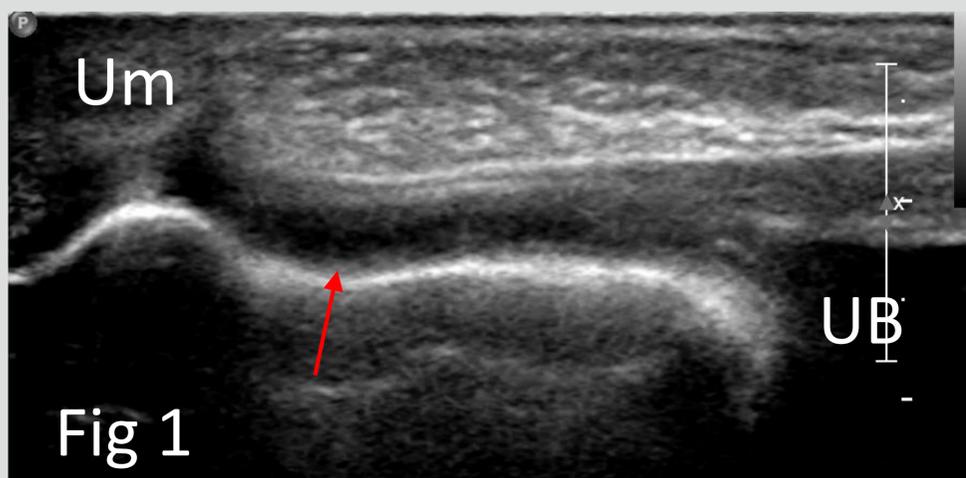
## Types of Urachal Anomalies

- A. Patent Urachus
- B. Urachal cyst
- C. Umbilical-urachal sinus
- D. Vesico-urachal diverticulum

Image from [abdominalkey.com/bladder-anomalies-in-children](http://abdominalkey.com/bladder-anomalies-in-children). Frimberger and Kropp

## (A) Patent Urachus

Commonest type; a tract is identified between the dome of the bladder and the umbilicus



**Figure 1: Patent Urachus.** 6-week old boy with persistently wet umbilicus. Sagittal image shows a patent fluid-containing urachus (arrow) connecting the bladder (UB) and the umbilicus (UM)



**Figure 2: Infected Urachus.** 5-week old boy with an inflamed umbilicus with purulent discharge. Sagittal image shows the patent urachus filled with fluid containing low level internal echoes in keeping with purulent contents.

with the umbilicus. On imaging, a urine-filled outpouching is seen from the bladder.

**Figure 5: Vesico-urachal Remnant**

6-week old girl with UTI. Sagittal image shows a urine filled outpouching from the anterior-superior end of the bladder.