



# Transperineal Ultrasound as an Adjunctive Modality in the Evaluation of 'H or N' Type of Recto-urethral Fistula: Technical Note

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## Abstract

### Keywords

- ▶ anorectal malformations
- ▶ H/N type rectourethral fistula
- ▶ transperineal ultrasound

Anorectal malformations (ARMs) encompass a complex spectrum of congenital anomalies and H/N type anorectal malformations are extremely rare. In the presence of colostomy, an augmented pressure colostogram with or without retrograde or micturating cystourethrogram is the investigation of choice. Transperineal ultrasound is an imaging technique that allows a fairly accurate morphological assessment of ARMs along with dynamic evaluation of the anorectal structures and pelvic floor anatomy. Here we describe the role of transperineal ultrasound as an adjunctive modality in diagnosis of one such complex anomaly.

## Introduction

Anorectal malformations (ARMs) encompass a complex spectrum of congenital anomalies involving the distal rectum and anus as well as urinary and or genital systems.<sup>1</sup> H/N type anorectal malformations are extremely rare, usually seen in females. In boys, they are associated with increased rates of major congenital anomalies.<sup>2,3</sup> In the presence of colostomy, an augmented pressure colostogram with or without retrograde or micturating cystourethrogram is the investigation of choice.<sup>2</sup>

In children, transperineal ultrasound (TPUS) has been used in the evaluation of anorectal malformations, Müllerian anomalies, and disorders of sex differentiation (DSDs).<sup>1</sup>

While augmented pressure colostogram is the gold standard for characterization of ARM and MRI is ideal for pelvic floor muscle assessment, TPUS offers a good combination of

both these utilities.<sup>4,5</sup> Here we describe the role of transperineal ultrasound as an adjunctive modality in the diagnosis of one such complex anomaly.

A 2-year-old male child patient complained of passage of urine from the anal canal, and occasional passage of a few drops of urine from the external urethral meatus. He had no incontinence or fecaluria. Local examination showed a narrow external urethral meatus, not admitting a 5 Fr infant feeding tube. Anal opening was seen at normal site. Abdominal ultrasound was normal.

Retrograde urethrogram (RGU), performed using a 20 gauge cannula, showed opacification of both the bladder and rectum. The anterior urethra was severely attenuated in caliber, with acute angulation at the bulbo-membranous junction (▶ **Fig. 1**). However, an obvious fistulous tract was not demonstrated. TPUS performed with high-resolution linear transducer (7–10 MHz) showed a hypochoic tract

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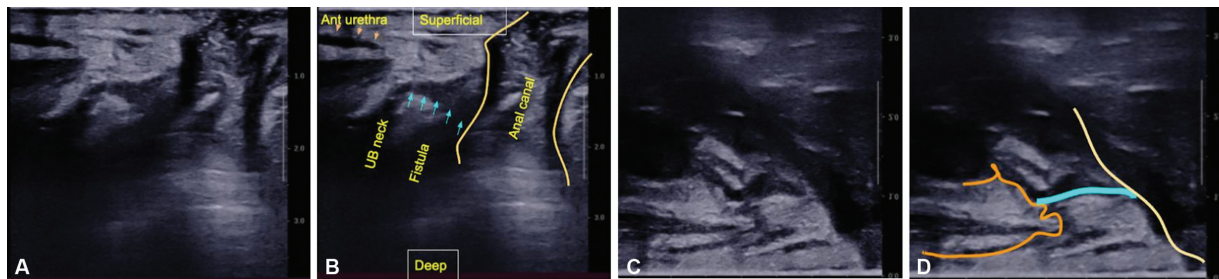
**Fig. 1** RGU image showing irregular attenuated urethra and an angulation at posterior urethra. Radio-opaque external marker is placed at anal canal.

between the urethra and anterior wall of the rectum, indicating a fistula (► **Fig. 2**). Micturating cystourethrogram was performed on a separate occasion after retrograde bladder filling through the distal urethral cannulation. It showed a

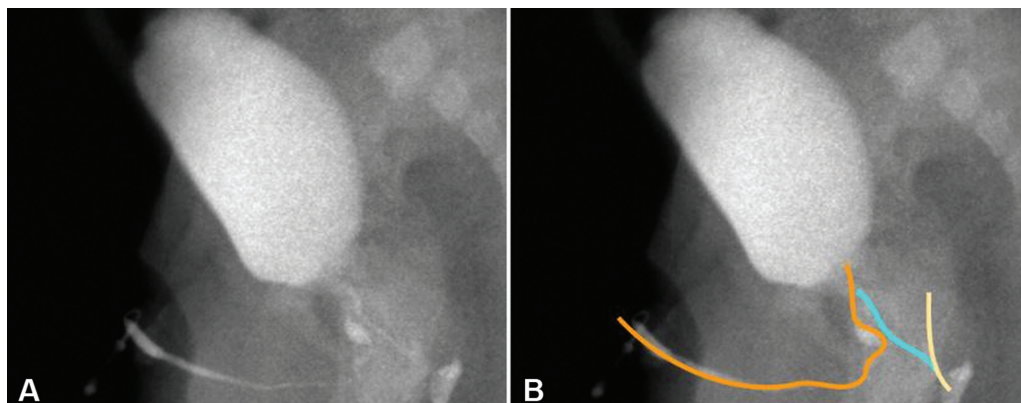
H/N type rectourethral fistula between the prostatic urethra and anorectum (► **Fig. 3**).

**Discussion**

H-type configuration is an extremely rare variant in the spectrum of anorectal malformations described under the recent Krickenbeck classification.<sup>3</sup> It differs from other ARMs in the fact that usually the anal opening is in normal location<sup>3,4</sup>. Majority of these patients have relatively continent sphincters, and abnormal passage of urine through the anal canal is often the only clinical clue. Therefore, imaging plays an important role in the diagnosis, and exact delineation of anatomy.<sup>5</sup> Cologram offers an objective demonstration of the anomaly; however, with proper technique and expertise, TPUS can replicate the same critical anatomical detail.<sup>5,6</sup> Moreover, the orthotopic urethra is often narrow, thereby making MCU difficult and posing imaging challenges in a child who has not undergone colostomy.<sup>5</sup> This was the situation in our patient, where TPUS added significant imaging input and guided further intervention. By demonstrating a sound fistulous tract anatomy, TPUS offers a potential role in differentiating low or intermediate/high variety of anorectal malformation. Simultaneous evaluation of internal pelvic anatomy and dynamic evaluation of pelvic floor muscles were additional benefits.<sup>4,6</sup> The study was performed without sedation, which also is a great advantage.



**Fig. 2 (A–D).** Transperineal US with the child in supine lithotomy position and the probe placed in mid sagittal and slight parasagittal plane (A - original, B- annotated). The fistula tract originates from the posterior urethra after a short distance from UB neck, and ends in the anterior wall of anal canal. Inverted image (C- original, D- annotated) for comparison with urethrogram shows the course of urethra (orange), fistula (torquiose), and anal canal anterior wall (yellow).



**Fig. 3 (A, B).** MCU image shows the microurethra ending in orthotopic meatus, and fistula tract opening in the anal canal. Annotated image (B) showing the ‘H’ shape of the urogenital tract anatomy, similar to that seen in TPUS (► **Fig 2**).

The main challenge in TPUS lies in its operator dependence, and long learning curve.<sup>5</sup> Nevertheless, its increased use as adjunct technique can improve diagnostic confidence in difficult cases.

#### Conflict of Interest

None declared.

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