

# Mullerian duct cyst treated with template-guided transperineal aspiration: a case report and review of the literature

Carnjini Yogeswaran, Vaikuntam Srinivasan and Kingsley C Ekwueme

Department of Urology, Glan Clwyd Hospital, Rhyl LL18 5UJ, UK

**Corresponding author:** Kingsley C Ekwueme. Email: Kingsley.Ekwueme@wales.nhs.uk

## Lesson

Template-guided transperineal aspiration is a minimally invasive treatment option for patients with Mullerian duct cysts. The precise targeting provided by the brachytherapy template grid enables specific targeting, quick recovery and resolution of symptoms without complications.

## Keywords

Mullerian duct cyst, template-guided transperineal aspiration

Mullerian duct cysts are rare and usually present a challenge for diagnosis and treatment. Various surgical approaches with varying success rates and complications have been described. However, there is now a growing desire for minimally invasive treatment, particularly in the younger patient group. This is the first case of a Mullerian duct cyst treated by template-guided transperineal aspiration, a minimally invasive, targeted and precise approach.

We describe the case of a 43-year-old Caucasian male presenting with a large Mullerian duct cyst confirmed on MRI scan and treated with Template-guided transperineal aspiration with complete resolution of the cyst.

## Introduction

Mullerian duct cysts are uncommon, with a reported prevalence of 1–5%.<sup>1</sup> Consequently, the diagnosis is often incidental and often requires a high index of suspicion.<sup>1,2</sup> When diagnosed, it presents a treatment challenge due to a combination of patient and technical factors. Overall, it is a condition affecting the younger age group where less radical treatment options are preferred. Few surgical treatment approaches, including open surgery and non-specific transrectal aspirations, have been reported, with varying success and complications.<sup>2</sup> In this paper, we describe the first case of a Mullerian duct cyst

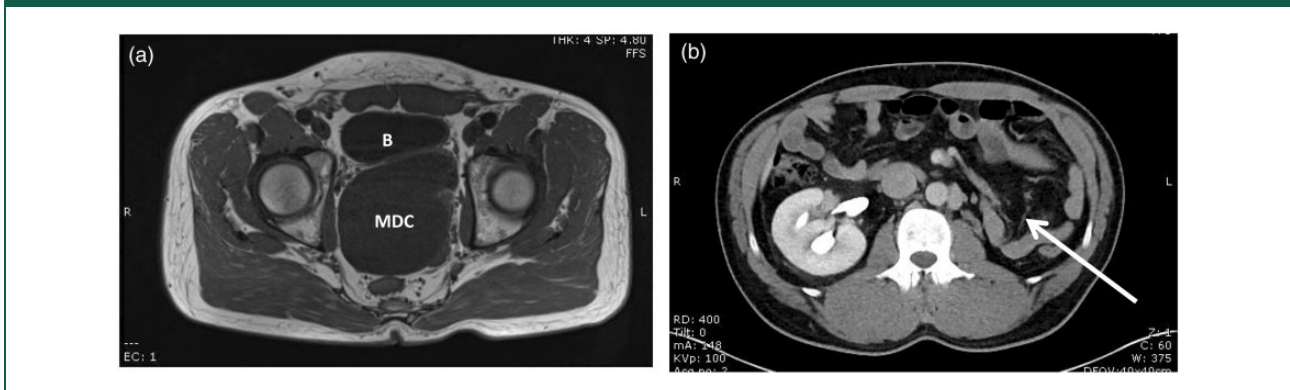
treated by a minimally invasive, precision-targeted approach via template-guided transperineal aspiration.

## Case presentation

A 43-year-old Caucasian male presented with lower abdominal and groin pain associated with urinary urgency prompting an ultrasound scan which incidentally revealed a large cystic mass posterior to the bladder and prostate. Physical examination was unremarkable but digital rectal examination revealed a palpable mass at the tip of the examining finger. An MRI scan confirmed an 8 cm midline pelvic cyst compressing the bladder, displacing it anteriorly (Figure 1(a)). Flexible cystoscopy confirmed that the cyst was not communicating with the bladder. CT urogram revealed left renal agenesis (Figure 1(b)).

Template-guided transperineal aspiration was performed under general anaesthesia as a day-case procedure. The set-up for the procedure is similar to our previous report on template-guided prostate biopsy.<sup>3</sup> In brief, the patient received a phosphate enema 1 hour prior to surgery and a single dose of 160 mg gentamicin was given on induction. Once anaesthetised, he was positioned in extended lithotomy, the scrotum was secured anteriorly with adhesive optape (Barrier<sup>®</sup>, Göteborg, Sweden) and the perineal skin was shaved, prepped and draped. A side viewing, biplanar implant probe (BK Medical, Herlev, Denmark) attached to a brachytherapy stepping unit (DK Technologies<sup>®</sup>, Barum, Germany) with a template grid was inserted into the rectum. Transrectal ultrasound confirmed the presence of a large cystic mass displacing the bladder and prostate (Figure 2(a)). The cyst was precisely targeted at the dependent region by advancing a 22G spinal needle (BD Medical<sup>®</sup>, Franklin Lakes, USA) through the fixed template grid (Figure 2(b)). A total of 250 mL of straw-coloured fluid was aspirated and complete collapse of cyst was achieved as demonstrated by

**Figure 1.** (a) MRI scan showing large septated MDC and compressed bladder (B) and (b) CT scan showing absent left kidney.



the return of the prostate to normal anatomical position (Figure 2(c)). The patient was discharged home the same day without complications and has remained asymptomatic.

## Discussion

Mullerian duct cysts result from a focal failure of regression and saccular dilatation of the mesonephric duct. They usually present in the third to fourth decade of life and may be associated with renal agenesis but external genitalia are usually normal.<sup>4</sup> Clinically, Mullerian duct cysts are often asymptomatic but may manifest with non-specific symptoms including haemospermia, ejaculatory disturbances, male infertility, pelvic or perineal pain, lower urinary tract symptoms or infections and acute urinary retention; but a significant proportion of cases are incidental findings.<sup>1,2</sup> As with our case, diagnosis is made by ultrasound and MRI. Transrectal ultrasound findings include a midline anechoic cystic structure posterior to the urethra and may extend above the base of the prostate. MRI findings include hypointense lesions on T1-weighted images and hyperintense lesions on T2-weighted images.<sup>4</sup> Treatment of Mullerian duct cysts are largely reserved for symptomatic and large cysts, but there is no consensus on the best method of treatment and choice of procedure is often individualised and based on clinical expertise.<sup>1,2</sup>

This paper is unique because it is the first case of a Mullerian duct cyst to our knowledge to be treated by template-guided transperineal aspiration. In our institution, we have extensive experience with the use of the brachytherapy template grid for prostate biopsy.<sup>3</sup> Hence, we hypothesised that the use of this technique for aspiration of a Mullerian duct cyst would result in a minimally invasive approach without infection risk as previously reported.<sup>5</sup> Similarly, application of this technique for Mullerian duct cysts therapy should

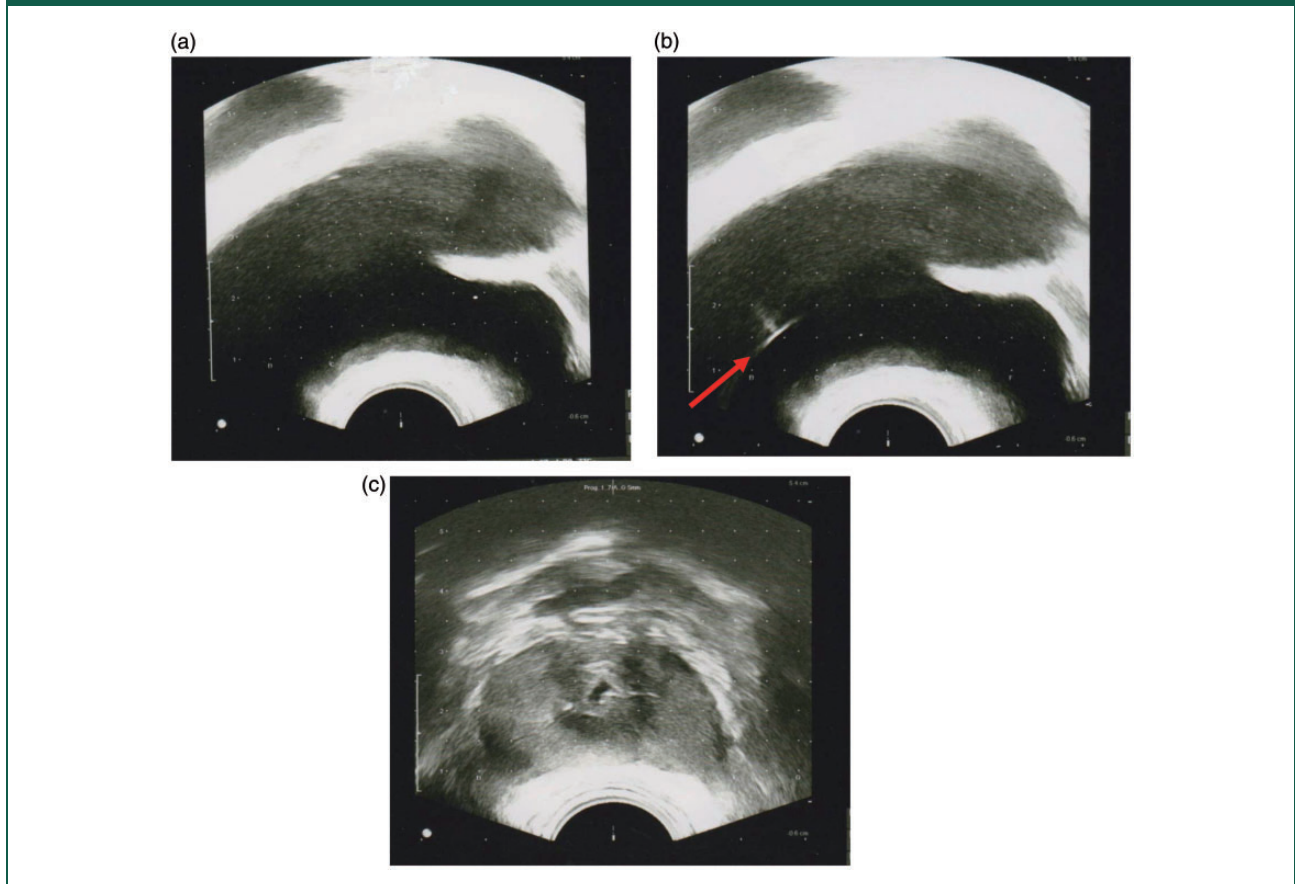
allow a more accurate and targeted aspiration avoiding blind and often multiple needle punctures, with risk of damage to surrounding structures. Furthermore, aspiration of the entire cysts can be performed via a single puncture minimising post-operative pain and avoids the transrectal route which can introduce faecal microbes into the cyst with risk of severe sepsis.<sup>6</sup>

Percutaneous aspiration of Mullerian duct cysts using transrectal and imprecise perineal approaches has been reported.<sup>1,7</sup> However, whilst transrectal approaches may be technically easier, higher rates of sepsis and increasing antibiotic resistance are of concern.<sup>5</sup> The downside to aspiration includes potential cyst recurrence. Although there are only a few reports in the literature, the suggestion is that recurrences are usually asymptomatic and rarely require repeat aspiration.<sup>1</sup>

Other treatment options including open surgical excision, laparoscopic or robotic excision and endoscopic techniques have been described.<sup>2,7,8</sup> Open surgical approaches include transperitoneal, retropubic extravesical, perineal and posterior or anterior transanorectal. The downside of these radical open surgical approaches is the high morbidity related to damage to surrounding structures including bladder, rectum, vas deferens, pelvic nerves, ureter and urethra due to their close proximity to the cyst.<sup>9</sup> Desautel *et al.*<sup>2</sup> reported complications including impotence, lack of ejaculation, urinary tract infection, external sphincter injury and rectourethral fistula with open surgical approaches with resultant prolonged hospital stay and recovery.

Others have reported laparoscopic and robotic excision with the proposed advantage of clear and magnified views of deep pelvic structures enabling more precise dissection and less risk of injury to surrounding structures and potential shorter hospital stay.<sup>8,10</sup> Nonetheless, these techniques are challenging and port placement can be difficult especially with large

**Figure 2.** (a) Transverse USS image of Mullerian duct cyst with superimposed template grid, prostate displaced superiorly, (b) needle targeted to dependent region of Mullerian duct cyst and (c) full prostate image after complete aspiration of Mullerian duct cyst.



cysts as in our case.<sup>10</sup> Endoscopic techniques have been reported including transurethral unroofing of the cyst and incision.<sup>1</sup> Nevertheless, whilst these endoscopic techniques avoid the need for a major operation, significant complications may result, including haematospermia, haematuria, urethral stenosis, seminal vesicle and vas deferens reflux of urine and subsequent obstruction, which may be unacceptable to young men who have not completed their family.<sup>1</sup>

## Conclusion

Template-guided transperineal aspiration is a minimally invasive, targeted and precise treatment option for patients with Mullerian duct cysts. It allows for quick recovery and resolution of symptoms with minimal complications, making it an attractive option for young patients.

## Declarations

**Competing Interests:** None declared.

**Funding:** None declared.

**Ethics approval:** Written informed consent was obtained from the patient for publication of this case report and accompanying images.

**Guarantor:** KCE

**Contributorship:** CY summarised the case and wrote the manuscript. VS provided advice. KCE is the principal author, surgeon and provided overall supervision in the writing of this article.

**Acknowledgements:** None.

**Provenance:** Not commissioned; peer-reviewed by Marios Hadjipavlou

## References

1. Coppens L, Bonnet P, Andrianne R and de Leval J. Adult Mullerian duct or utricle cyst: clinical significance and therapeutic management of 65 cases. *J Urol* 2002; 167: 1740–1744.
2. Desautel MG, Stock J and Hanna MK. Mullerian duct remnants: surgical management and fertility issues. *J Urol* 1999; 162: 1008–1013.
3. Ekwueme K, Simpson H, Zakhour H and Parr NJ. Transperineal template-guided saturation biopsy using

- a modified technique: outcome of 270 cases requiring repeat prostate biopsy. *BJU Int* 2013; 111: E365–E373.
4. Shebel HM, Farg HM, Kolokythas O and El-Diasty T. Cysts of the lower male genitourinary tract: embryologic and anatomic considerations and differential diagnosis. *Radiographics* 2013; 33: 1125–1143.
  5. Sivaraman A, Sanchez-Salas R, Ahmed HU, et al. Clinical utility of transperineal template-guided mapping biopsy of the prostate after negative magnetic resonance imaging-guided transrectal biopsy. *Urol Oncol Semin Orig Invest* 2015; 33: 329.e7–329.e11.
  6. Borghesi M, Ahmed H, Nam R, et al. Complications after systematic, random, and image-guided prostate biopsy. *Eur Urol* 2017; 71: 353–365.
  7. Kobori Y, Sato R, Ashizawa Y, et al. Mullerian duct cyst: a curable entity of male infertility. Two case reports. *Reprod Med Biol* 2010; 9: 223–224.
  8. Hong YK, Onal B, Diamond DA, et al. Robot-assisted laparoscopic excision of symptomatic retrovesical cysts in boys and young adults. *J Urol* 2011; 186: 2372–2378.
  9. Krstić ZD, Smoljanić Ž, Mićović Ž, et al. Surgical treatment of the Mullerian duct remnants. *J Pediatr Surg* 2001; 36: 870–876.
  10. Luo J-H, Chen W, Sun J-J, et al. Laparoscopic management of Müllerian duct remnants: four case reports and review of the literature. *J Androl* 2008; 29: 638–642.