

# Renal calyceal rupture and perirenal urinary extravasation from complete procidentia

Cindy Ko-Chen Kao · Jane A. Schulz ·  
Cathy Gwen Flood

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**Abstract** Genital prolapse is common among ageing women. Urinary obstruction and hydronephrosis have been reported as one of the most severe and fortunately uncommon complications. An 82-year-old multiparous woman with symptomatic pelvic organ prolapse quantification stage 4 genital procidentia fails multiple trials of pessary and abandons the trials due to significant side effects. She chooses to pursue conservative management with estrogen cream and tight underwear. However, she fails to follow up as planned. Two years later, she presents with acute abdomen and renal failure due to renal calyceal rupture and perirenal urinary extravasation from complete procidentia. She is treated promptly with urinary catheter, manual prolapse reduction, and Gellhorn pessary which relieves anuria and stabilizes her condition. She then receives definitive surgical treatment 2 weeks later. Her renal failure and abdominal pain resolve post-operatively.

**Keywords** Complete procidentia · Genital prolapse · Calyceal rupture · Perirenal urinary extravasation

## Introduction

Genital prolapse is becoming more prevalent due to the ageing population. Lower [1] and upper tract urinary obstructions [2] have both been reported as an infrequent complications of prolapse. The estimated prevalence of hydronephrosis is 7.7% to 34.6% [3, 4]. Renal calyceal rupture is a rare condition that has been associated with

blunt trauma, cancer, and idiopathic causes. We describe the first known case of renal calyceal rupture and perirenal urinary extravasation due to long-standing complete procidentia.

## Case report

An 82-year-old para 3 woman presented to the urogynecology clinic in 2004 with a long-standing history of cystocele, rectocele, and uterovaginal prolapse. She had three vaginal deliveries and one with forceps, all with perineal tears, and the largest baby was 5 kg. Her past medical history included rheumatic fever, hypertension, osteoarthritis, glaucoma, and cataracts. Her only surgery was an appendectomy in 1933. She was an ex-smoker who quit 25 years ago.

In 2003, the patient presented to a general gynecologist with urinary urgency, nocturia, and bowel incontinence which was treated conservatively with pessaries. Initially on physical examination, she was found to have large defects in the posterior and lateral walls with pelvic organ prolapse quantification stage 4 uterine descent. She had a normal uroflow and a post-void residual of 63 mL. A 3 1/2-in. Gellhorn pessary was initially tried but failed. Multiple pessaries were tried over 1 year through the nurse-run tertiary-care pessary clinic. These provided no relief of her symptoms and resulted in complications of vaginal irritation, erosion, and discharge.

The patient refused any further attempts and decided to stop using the pessaries. After extensive discussion, the patient agreed to a 3-month trial of vaginal estrogen cream, incontinence pads, and tight underwear as conservative management. The patient was then referred to the urogynecologist at which time surgical options were discussed (both vaginal and abdominal approaches); however, the patient

C. K.-C. Kao · J. A. Schulz (✉) · C. G. Flood  
Royal Alexandra Hospital,  
Edmonton, AB, Canada  
e-mail: schulz@ualberta.ca

adamantly refused surgical intervention. She was referred back to her general gynecologist but was lost to follow-up.

In 2006, the patient collapsed at home and was brought to the hospital in acute sepsis and renal failure. She presented with acute abdomen and was admitted under general surgery. At the time of admission, she was found to have anuria for 12 h and a complete procidentia to 15 cm beyond her introitus. Initial laboratory investigations showed leukocytosis (WBC count  $12.7 \times 10^9/L$  [normal 4–11]) as well as significantly elevated serum urea (10.8 mmol/L [normal 2.5–8.0]), and creatinine ( $>1,200$  mmol/L [normal 40–115]). She was treated initially with a Foley catheter and antibiotics for presumed UTI.

She complained of acute left lower quadrant abdominal pain. CT scan of her abdomen and pelvis revealed the presence of a large rectocele, cystocele, and bilateral ureteric obstruction with considerable hydronephrosis. Furthermore, there was a left sided renal calyceal rupture with urine extravasation in the perirenal space.

To protect her kidney function, the prolapse was manually reduced and a Gellhorn pessary was inserted by two skilled gynecologists. She immediately started to void after pessary insertion. Cystoscopy and retrograde urethrogram further confirmed bilateral hydronephrosis and severe cystocele. Bilateral double-J stents were inserted temporarily. Her serum creatinine normalized over 2 weeks and her previously swollen procidentia partially settled.

It was felt that the abdominal approach would be more appropriate given the severity of her prolapse; however, the vaginal approach was also discussed. With informed consent, she underwent total abdominal hysterectomy, bilateral salpingo-oophorectomy, abdominal colposacropexy with mesh, combined abdominal-vaginal fascial sling, anterior repair, and posterior repair with donor fascia. The sling was done to prevent latent stress incontinence and support the cystocele, although the patient did not have preexisting overt stress incontinence. The surgery went well without any complications and the patient had a good post-operative recovery.

Her acute abdominal pain resolved and renal function returned to baseline. After consultation with social work, the patient was then discharged home. Bilateral ureteric stents were removed 6 months later.

## Discussion

Genital prolapse is increasingly more common due to the ageing population. One large cohort study has estimated that the lifetime risk of requiring at least one operation for prolapse or urinary incontinence by age 80 is approximately 11% and the risk increases with age [5].

Although the exact mechanism of genital prolapse is still poorly understood, many risk factors have been identified.

Women with advancing age, multiparity, and chronic intra-abdominal pressure (obesity, COPD, constipation) are at high risk of developing prolapse [5]. Interestingly, pregnancy alone, with or without vaginal delivery, has also been recognized as an independent risk factor [5]. Since many of the risk factors are non-modifiable, it is essential to understand the consequence and management of genital prolapse.

Urinary obstruction has been reported to be an uncommon but strongly associated complication of genital prolapse [1]. Patients can present with lower urinary tract symptoms, such as frequency, urgency, incontinence, incomplete emptying, or in severe cases, anuria like in our patient. Upper urinary obstruction can also occur but may remain a silent event [2]. Although hydronephrosis is uncommon, about 7.7% of patients undergoing surgery for pelvic organ prolapse, its prevalence is as high as 34.6% in patients with severe prolapse [3]. Hence, it is crucial to have meticulous investigation for patients with high grade prolapse.

Bilateral ureteric obstruction associated with genital prolapse is extremely rare [1]. To the best of our knowledge, this is the first reported case in current literature of severe bilateral hydronephrosis and unilateral renal calyceal rupture due to a long-standing stage 4 procidentia. Delayed augmented CT scan of the abdomen and pelvis also provides evidence of left perirenal urinary extravasation, which leads to sepsis and acute renal failure in this patient. Neither the syncope nor the left lower quadrant abdominal pain that the patient presented with is a typical feature of genital prolapse. Thus, this case highlights the importance of thorough physical examination and keeping a broad differential diagnosis for common presentations such as sepsis and renal failure.

We urgently place a Gellhorn pessary to reduce the prolapse and relieve anuria in order to preserve kidney function. We have observed that acute renal failure due to urinary obstruction from severe prolapse is reversible as our patient's creatinine level normalizes during hospitalization.

The choice between vaginal versus abdominal approach depends on many factors, such as patient characteristics, durability, recovery time, complications, and foreign body risks. A number of randomized trials have shown that abdominal sacrocolpopexy with mesh is superior to vaginal sacrospinous ligament suspension with less recurrence and complications [6]. Based on the severity of her prolapse, significant history of vaginal erosion, and complication of renal calyceal rupture, the abdominal approach was chosen in her case to maximize exposure of pelvic anatomy although both options were fully discussed with the patient.

This case demonstrates a common condition resulting in an uncommon but potentially fatal complication. It illustrates the significance of diagnostic imaging, timely management of genital prolapse, and follow-up for all patients with pelvic organ prolapse.

**Conflicts of interest** None.

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