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Extravesical diverticulectomy: a case report



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Pande Made Wisnu Tirtayasa^{1*}, Wempy Supit², Firdaus Saleh²

ABSTRACT

Background: Several factors cause bladder diverticula. In adult males, the incidence tends to be due to infravesical obstruction. Various techniques have already been introduced to remove the bladder diverticula, which the most hazardous method is the extravesical diverticulectomy technique. This case study aims to report our successful experience in treating a patient with bladder diverticula with extravesical diverticulectomy technique.

Case Description: A 69-year-old man was admitted to the urology clinic with recurrent urinary tract infection. Ultrasonography examination revealed bladder diverticula, mild bilateral

hydronephrosis without prostate enlargement. Preoperative urethroscopy confirmed the presence of urethral stricture. Internal urethrotomy was performed, followed by extravesical diverticulectomy. The postoperative patient healed remarkably and no complaints were reported.

Conclusion: The extravesical diverticulectomy approach seems to be a safe, simple, effective method and can be performed for many sizes of bladder diverticula when performed by an experienced surgeon.

Keywords: Bladder Diverticula, Diverticulectomy, Extravesical, Technique

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¹Division of Urology, Department of Surgery, Faculty of Medicine, Universitas Udayana, Sanglah General Hospital, Bali, Indonesia

²Consultant of Urology, Pelni Hospital, Jakarta, Indonesia

INTRODUCTION

Bladder diverticula are caused by several conditions such as bladder outlet obstruction, iatrogenic due to bladder surgery, or congenital malformations.¹ Regardless of the cause, all diverticula arises as herniation of the bladder's mucosa between the defect on its smooth muscle fibers.² Even though bladder diverticula incidence is reported to be low in a pediatric population, in adult males, the occurrence of bladder diverticula tends to be higher due to the higher incidence of bladder outlet obstruction.^{1,2}

Urinary bladder diverticula in both the adult and pediatric cases are relatively rare.³ The risk of urothelial carcinoma development within the lesion has been associated with their adult population presence.^{4,5} In the adults, bladder diverticula are commonly caused by pathologic processes which differ from pediatric patients where congenital process as the leading factor.^{6,7} A previous study found that the male population older than 50 years old was predominant due to a sequela of benign prostatic hyperplasia.^{6,8} A chronic urinary stasis related to the bladder diverticula can lead to bladder calculi and subsequent infections, whereas highlighting the importance of appropriate management such as surgery.⁹ A various management of bladder diverticula has

been elucidated, including formal diverticulectomy either by open or laparoscopic approach as well as extravesical diverticulectomy technique.¹⁰

This case report aims to describe and review our experience in treating a patient with bladder diverticula with extravesical diverticulectomy technique at Sanglah General Hospital, Bali, Indonesia.

CASE REPORT

A 69-year-old male with a chief complaint of pain in micturition and recurrent urinary tract infection was admitted to the emergency ward. Ultrasonography confirmed the presence of bladder diverticula size 7.37 cm x 4.57 cm (Figure 1), mild bilateral hydronephrosis, with post-void residue (PVR) 356 ml and PVR on diverticula was 119 ml, and no enlargement on the prostate.

Preoperative cystoscopy revealed urethral stricture on pars membranoprostatica and internal urethrotomy was performed. Trabeculations and sacculations with cystitis were seen with a narrow opening of diverticula located at the left ureteral orifice's superolateral. Extravesical diverticulectomy was then performed (Figure 2). Saline irrigation through a three-way urethral catheter was maintained for 24 hours post-operatively.

At the postoperative follow-up visit to the

*Corresponding to:
Pande Made Wisnu Tirtayasa;
Division of Urology, Department of Surgery, Faculty of Medicine, Universitas Udayana, Sanglah General Hospital, Bali, Indonesia;
wisnu_tirtayasa@unud.ac.id

outpatient clinic, the patient showed remarkable recovery without any symptoms left.

DISCUSSION

Diverticula of the bladder can be classified as either acquired or congenital.¹ The congenital diverticula usually occur during childhood.¹ The primary causation of congenital diverticula seems to be the weakness of the ureterovesical junction instead of infravesical obstruction.^{2,3} Acquired bladder diverticula happen most commonly in the

condition of infravesical obstruction or neurogenic dysfunction of vesicourethral, but might also be iatrogenic.¹¹ Acquired bladder diverticula in men usually present later in life, which correlated to the age at the development of prostatic hyperplasia.¹¹

Voiding cystourethrography (VCUG), which fluoroscopically monitored, is an exceptional examination to evaluate bladder diverticula.¹² Another examination to detect bladder diverticula are excretory urography, ultrasonography, CT-scan, and cystoscopy.^{11,13} Upper urinary tract imaging is sometimes required to detect the hydroureteronephrosis that may concomitantly occur with bladder diverticula.¹¹

The increase of vesical pressure due to the infravesical obstruction causes the bladder mucosa to protrude between its muscle fibers.² This mechanism is one of the examples of several mechanisms that lead to diverticula. The bladder diverticula might also occur by weakening the bladder muscle due to infection or the bladder's smooth muscle defect following bladder surgery.² The Waldeyer's sheet usually damages as the bladder diverticula increase in size. The expanding diverticula pull the intravesical ureter out of its position and may interfere with the ureterovesical junction. Eventually, the ureteral obstruction can occur due to the enlarged diverticula.^{2,11} Bladder diverticula can compress the urethra's bladder neck and posterior of the urethra if the diverticula are located in the lower part of the bladder.^{2,11} This condition became a vicious cycle as the resulting obstruction continuously increasing the size of the diverticula and eventually causes complete urinary retention.^{2,11}

In the case of acquired bladder diverticula, the bladder outlet obstruction has to be treated first.^{2,13,14} After eliminating infravesical obstruction, the bladder might reshape, and bladder diverticula treatment might not be necessary.^{13,14} If the bladder diverticula need to be removed, the surgeon has to pay attention toward the ipsilateral ureter, whether it should be reimplanted if the ureter is near or included in the bladder diverticula. The most universally practical technique is the removal of the lining extravesical.^{13,14} Another alternative is to invert the bladder diverticula into the bladder and excise it. Minimally invasive techniques such as laparoscopy have been applied to bladder diverticulectomy, but this technique needs sophisticated tools as well as a steep learning curve for the surgeon.¹³⁻¹⁵ The most hazardous method, because of the possibility of ureteral injury, is dissecting the entire diverticulum out and excising it extravesical. Even though this technique is considered a perilous technique, it can become an

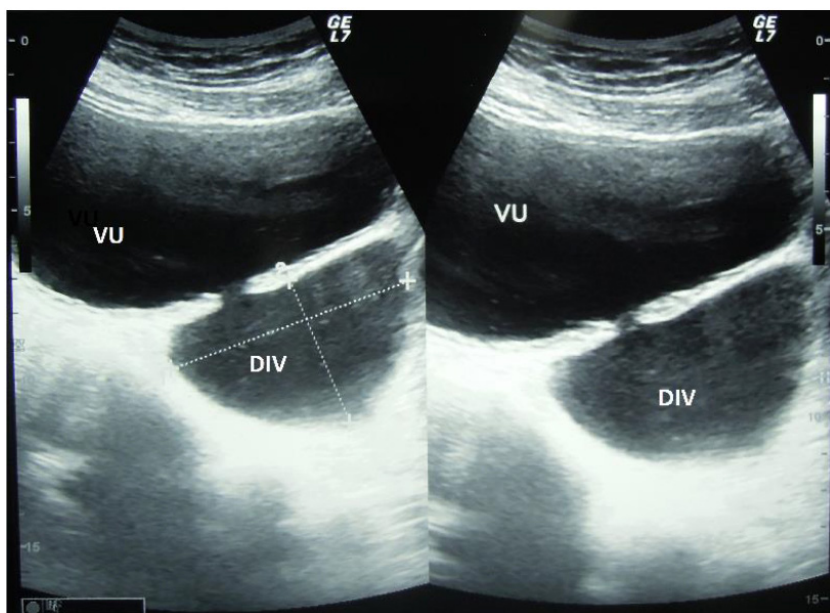


Figure 1. Ultrasonography showed bladder diverticula. VU: vesica urinaria, DIV: diverticula

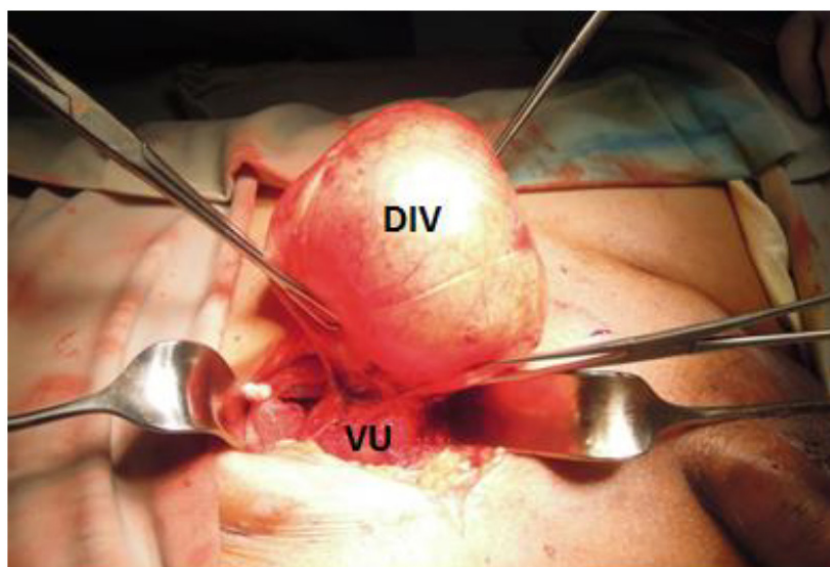


Figure 2. Bladder diverticula shortly before excised from the bladder. VU: vesica urinaria, DIV: diverticula

effective and safe option in the hand of experienced surgeons, as reported in several cases.^{10,16,17}

CONCLUSION

This recent report reveals that the extravesical diverticulectomy technique as operative management of bladder diverticula appears to be a simple and effective approach and can be safely performed for many bladder sizes diverticula when performed by an experienced surgeon.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest regarding the publication of this manuscript.

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AUTHOR CONTRIBUTION

All authors contributed equally to this manuscript's content from the selection cases, surgery intervention until reporting the results of case study through publication.

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