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Original Article

Radiological interpretation of anterior urethral valve - a rare urological disease

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ABSTRACT

Anterior urethral valves (AUVs) are uncommon congenital anomalies causing urethral obstruction in boys and uncommon causes of lower urinary tract obstruction. Hameturia, urinal tract infection and weak voiding confirmed the diagnosis. On cystoruethroscopy, cusp like valves in the anterior urethral were seen. Although they are referred to as valves. These cases shows saccular or bulbar dilatation known as anterior urethral diverticulum (AUD). They typically occur where there is a defect in the corpous spongiosum. Leaving a thin-walled urethra. This segment of the urethra balloons out during voiding, simulating a mass that is sometimes visible along the ventral wall of the penis. The swelling is fluctuant and urine dribbles from the meatus on compression. AUV are extremely serious and if left untreated may result in end stage renal disease. The presence of valves in the anterior urethra is a rare pathology. Anterior valves are more frequently located at the bulbar level and are associated with urethral diverticula. Clinical manifestations are secondary to the obstructive process and can have mild to severe urodynamic repercussions. Treatment is always surgical, and can be endoscopic or open surgery. The present study reveals the importance of RGU and MCU in diagnosing the anterior urethral valve radiologically.

Key words: Urethra, Valve, diverticulum, Endoscopic

INTRODUCTION

Anterior urethral valve or valves (AUV) is a rare congenital disorder. Its incidence is 1 in 5000-8000 births. AUV are less frequent than posterior urethral valves and often are not discovered due to their rareness. Etiology is uncertain but they may be the result of a failed attempt at urethral duplication. Another hypothesis is that these valves occur due to cystic dilatation of the periurethral glands that are joined to the urethra as a result of the formation of folds. Although they are called valves, these obstructive structures often present in the form of a diverticulum or accompanied by a urethral diverticulum.In AUV, the urethra has a secular or bulbar dilatation. They are generally produced when there is a defect in the corpus spongiosum, leaving a thin urethral wall. This segment of the urethra distends during micturition, simulating a mass that is sometimes visible along the ventral wall of the penis .Some authors state that the most common localization is in the distal urethra.[8] Others refer to the anatomical presence of anterior valves in the urethral tract in percentages, documenting more in the bulbar urethra (40%), at the junction of the penile urethra and bulbar urethra (30%), and in the penile urethra (30%). It is not easy to radiologically demonstrate AUV, especially if they are not associated with urethral diverticuli.7,9.

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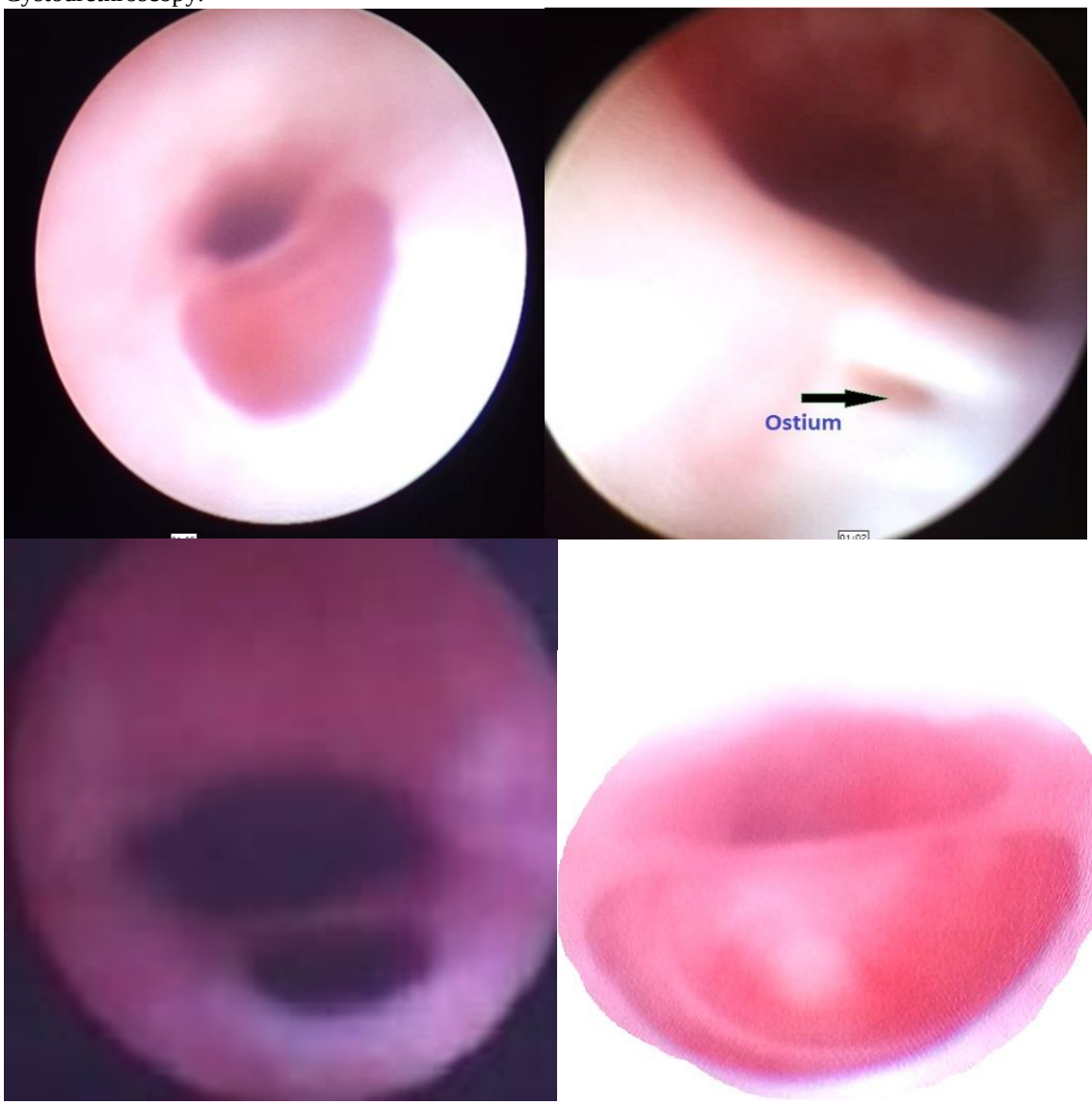
Cystourethroscopy.

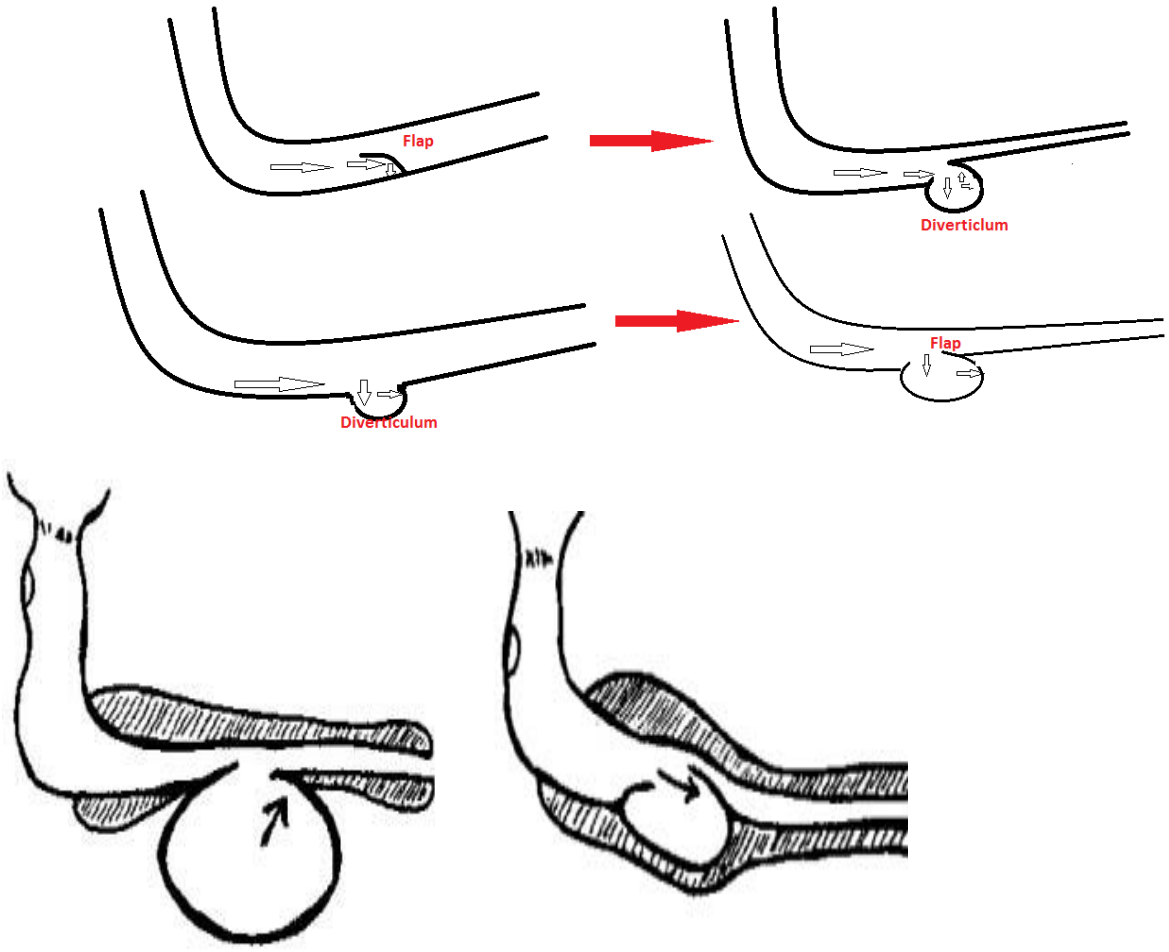


DISCUSSION

AUV have been reported less frequently than posterior urethral valves, at a ratio of 1:10. This urethral anomaly can lead to varying urinary tract symptoms depending on the patient, age, and degree of obstruction. Clinical symptoms are varied, from irritative bladder symptoms, hematuria, urinary infection, reduction of urinary strength and caliber, dripping, urinary retention, incontinence, enuresis, to terminal kidney failure. Urethral obstruction can lead to detrusor hyperactivity and partial imbalance of the sphincter, predisposing the patient to incontinence or nocturnal enuresis. Symptoms are principally dependent on age at time of presentation and degree of obstruction.[1] Micturition cystourethrography is the study of choice for this pathology, revealing anatomical characteristics of the bladder and urethra. Today videourodynamic studies can be done to show the connection between the anatomy and the functioning of the urinary tract and the pelvic floor. Clinical evaluation should be accompanied by renovesical echogram, cystourethrogram, excretory urography, and urethrocystoscopy.[3] The treatment of choice is endoscopic surgery with valve ablation using transurethral electrofulguration. The objective of the procedure is to achieve valve ablation and free urinary flow.[1,4] If equipment for endoscopic ablation is not available, open valve resection is an equally good alternative. Other options are vesicostomy in children with severe vesicoureteral reflux, urethroplasty in cases involving the urethra, and diverticulectomy in results associated with diverticulum.[2] AUV are extremely rare congenital entities which cause obstructive uropathy in the lower urinary tract of children and can be difficult

to diagnose[34]. Their occurrence has also been described in adolescents and adults[8]. The frequency of AUV is eight times lower than the frequency of PUV[9]. No family pattern of inheritance has been detected for these lesions. Associated malformations are undoubtedly rare, despite the many cases of an association between diverticula and prune belly syndrome[5],[10]. Some cases of AUV also have been reported in the navicular fossa[11].

The clinical presentation of AUV: The common presenting complaints include difficulty in voiding, dribbling on micturition, incontinence, poor urinary stream and recurrent UTI[6]. In the neonatal period and infancy, AUV may cause severe obstruction resulting in megacystis, bladder rupture, bilateral server Hydrouretronephrosis, azotemia and urinary ascites[7,12]. In one-third of patients there is VUR, and in half of them upper tract damage is present[13]. Hematuria, UTI and poor urinary stream is the most common symptoms.

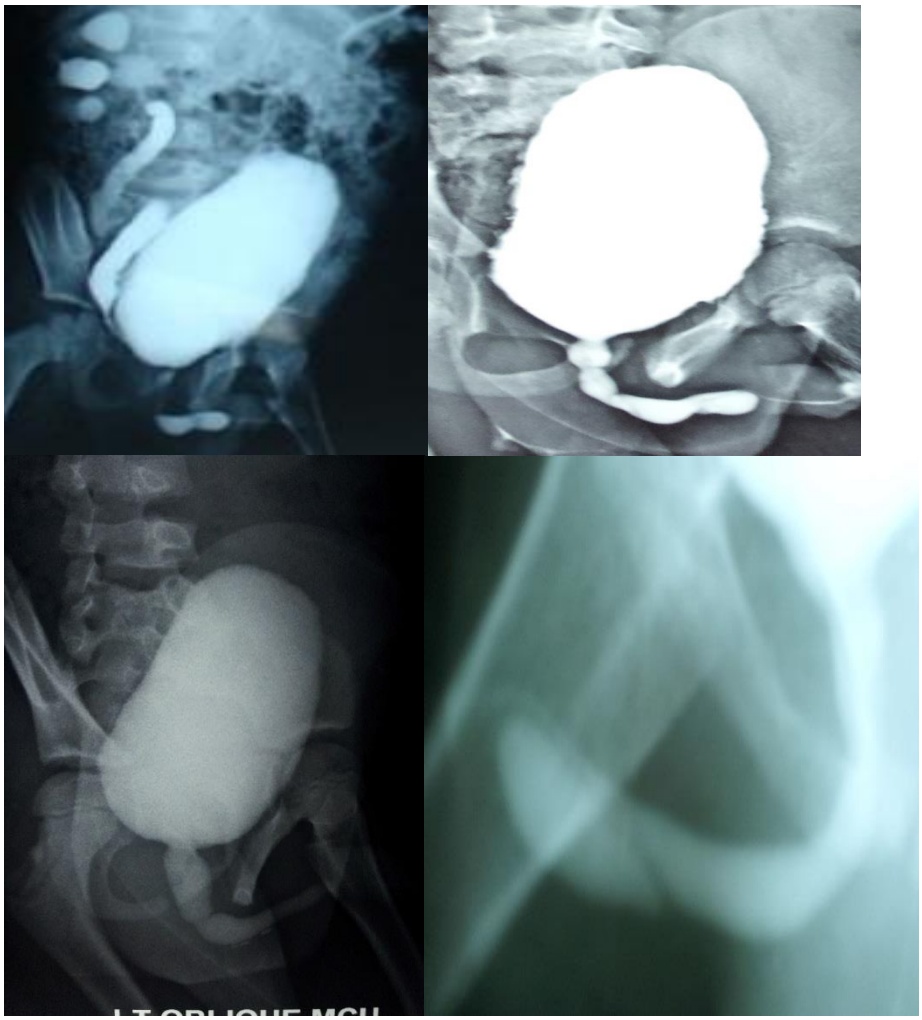


Figurs showing flap and diverticulum formation.

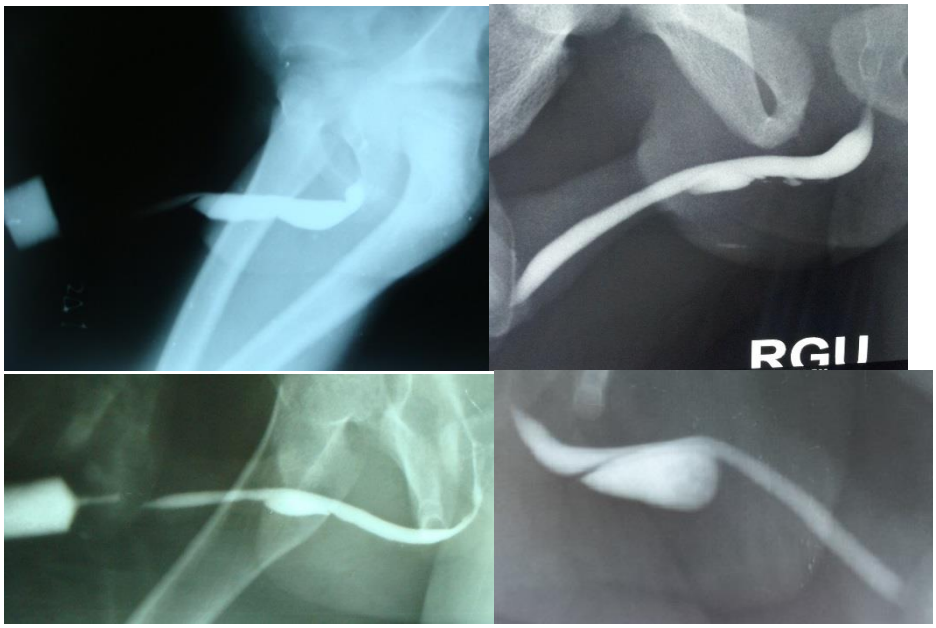
DIAGNOSTIC TOOLS

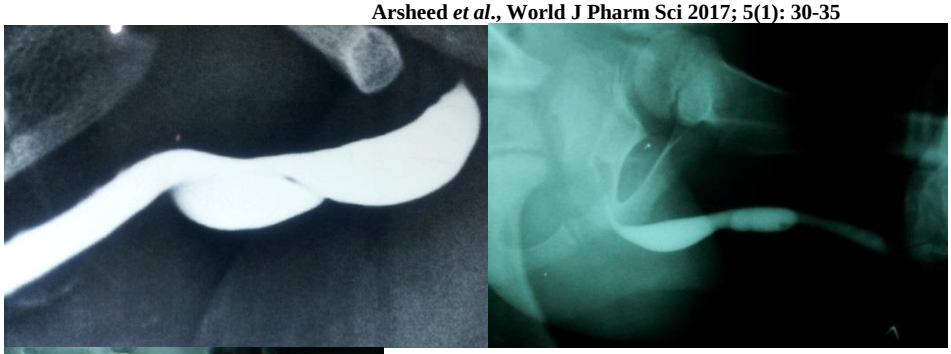
Ultrasonography may suggest the diagnosis of AUV through visualization of urethral dilatation and the renal parenchyma, especially the presence and intensity of renal dysplsia. On this examination, unilateral or bilateral fetal hydronephrosis, associated or not with oligohydramnios, but followed by persistent bladder distension. Transpenile ultrasound during voiding may be helpful in the diagnosis of AUV[14].However this study shows that RGU and MCU shows accurate results desired to diagnose the disease and to reveal the changes in the disease process.

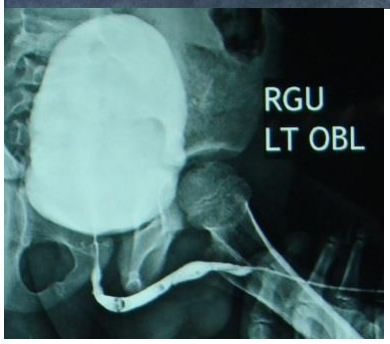
VCUGs

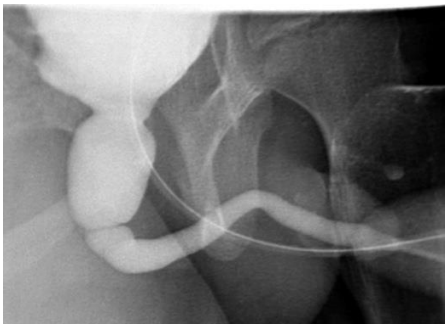


RGUs



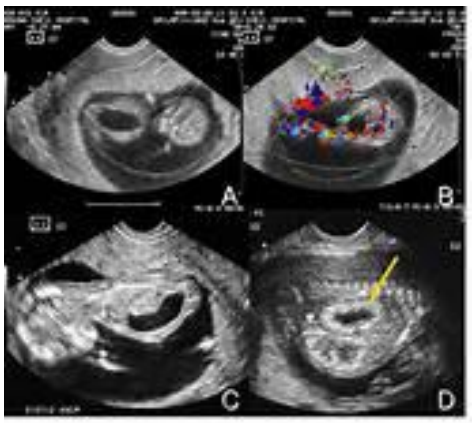


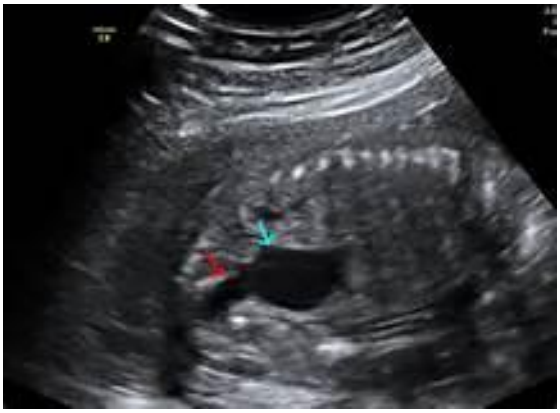


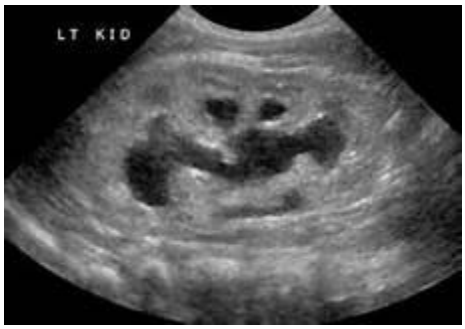


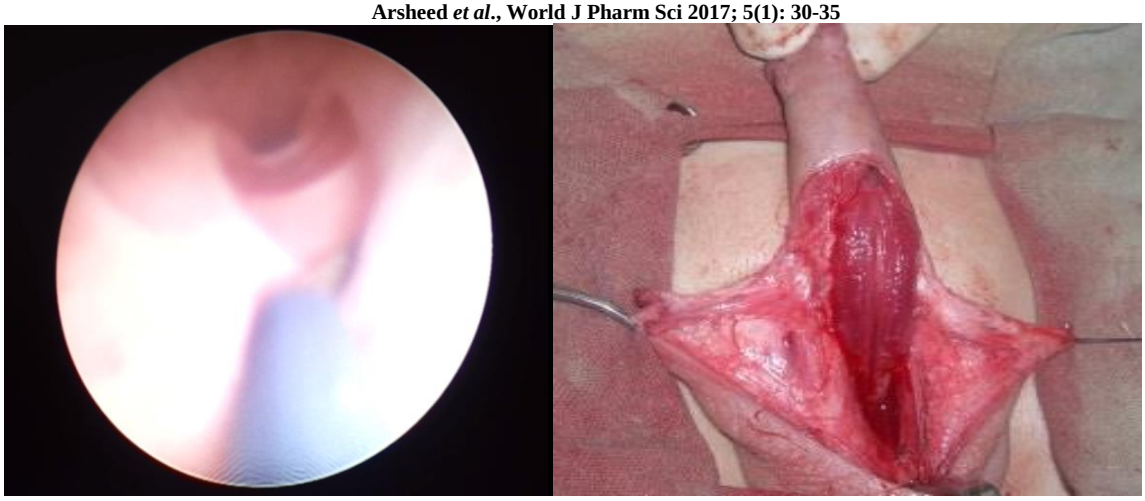
TREATMENT MODALITY:

There are various treatment methods such as open urethrotomy and excision of the valve, segmental urethrectomy of the valve-bearing area along with a primary end-to-end anastomosis, cold disruption and transurethral resection of the valve[6]. Since the 1990's endoscopic valve ablation has been the procedure of choice. Destroying the valve by electrocautery or by a resecting hook is preferred ove dilatation maneuvers or a direct surgical approach[13]. Endoscopic valve fulguration or clod disruption are viable options. Currently, in all ages, with the advances in endoscopic techniques, endoscopic value resection is generally performed successfully.Open reconstruction is recommended for large diverticula with inadequate spongiosum[13,15]. Open urethroplasty is useful in patients with large urethral diverticulum and thin urethra.









Open repair **Diverticulectomy/Urethroplasty**

RESULTS

In the present study was done on 200 patients who were clinically symptomatic and have been screened for further radiological investigations viz., MCU and RJU for evaluation of anterior urethal valve, it has been seen that eight patients were found having anterior urethral valve . In the present study the sensitivity of RJU and MCU was clearly established in the accurate diagnosis of this disease. Further the rear nature of this disease is also established by screening large population first clinically and then radiologically.

CONCLUSIONS:

Obstructive congenital pathologies of the anterior valves (valves, diverticuli) are rare and can be difficult to diagnose. Anatomical interpretation of these lesions is far from unequivocal and it is necessary to distinguish between valves and diverticuli. The main difference lies in abnormality and corpus spongiosum adjacency. Clinical presentation is age-dependent and diagnosis depends essentially on RJU and MCU. Generally, valve treatment is simple and is carried out with endocopic resection-fulguration. Most of the cases can be diagnosed with retrograde urethrogram. Open repair with diverticulectomy and urethroplasty should be reserved for those with larger diverticuli and megalourethras. From the study of anterior urethral valve it has been observed that radiologically MCU(micturating cystourethogram) and RGU(Retrograde urethrogram) have similar sensitivity and specificity but MCU gives more information regarding upper urinary track so radiologically much emphasis has been laid on MCU.

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