The blind-ending bifid ureter is a rare congenital anomaly of urinary system. We presented one case of the blind-ending bifid ureter which originates from the middle third ureter. The embryogenesis and possible mechanisms are reviewed. Changing positions in projections during intravenous urography provides more information of the blind-ending branch. Intravenous urography is one of the best modality to diagnose the blind-ending bifid ureter.

**Key words:** ureter, abnormalities; Intravenous urography; ureter, calculus

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The blind-ending bifid ureter is a rare congenital urological anomaly and only few cases have been reported in the literature [1-6]. The presenting symptoms and signs among the reported cases are variable. Some of them are symptomatic with fever, chills, abdominal pain, hematuria or pyuria, while many cases are silent [5-8]. The mechanism of blind-ending bifid ureters is still unclear [8, 10]. The majority of cases have been diagnosed by intravenous urography or retrograde pyelography [7-9]. We present a case of blind-ending bifid ureter and review the possible mechanisms of this disease.

**CASE REPORT**

A 24-year-old female patient who had been well before presented with left lower quadrant abdominal pain for half a day. She was sent to our emergency department later at the same day. Physical examination revealed knocking pain over the left flank area and urine analysis showed microscopic hematuria. The intravenous urogram delineated a left distal ureteral stone with mild hydronephrosis and hydroureter and a right blind-ending bifid ureter was incidentally found (figure 1 and figure 2). ESWL was performed smoothly for the left distal ureteral stone. No surgical intervention was done to the right blind-ending bifid ureter.

**DISCUSSION**

The blind-ending bifid ureter is a rare congenital anomaly of urinary system [1-6]. Culp defined it as any blind-ending hollow structure with its lumen joining the ureter at an acute angle, its wall presenting the same components as the ureter and its length greater than twice of its greatest diameter [11].

In order to understand the possible mechanisms of the blind-ending bifid ureter, normal embryogenesis of urinary system is reviewed at first. At the embryonal age of approximately the fifth week, two major components of urinary system including ureteric bud and metanephrogenic blastema begin to develop. The ureteric bud is derived from mesonephric duct and
finally develop into ureter, renal pelvis, renal calices and collecting tubules. When the ureteric bud grows cranially, it contacts with metanephrogenic blastema and induces the development of blastema. The metanephrogenic blastema finally covers the cranial end of the ureteric bud and it is the primordial portion of the permanent kidney [10]. The exact mechanism of the blind-ending bifid ureter is still unclear [8, 10]. The mechanisms ever described in the literature were associated with abnormal development of the ureteric bud and failed development of metanephrogenic blastema. One possible mechanism is associated with an unknown ureteric bud branching defect. If the ureteric bud divides and develops, separately duplication of the urinary system occurs. An unknown ureteric bud branching defect of the division leads to the blind-ending bifid ureter with a single ureteral orifice. Another possible mechanism is associated with the incompletely developed double ureteric buds. If two ureteric buds form and one fails to contact with the metanephrogenic blastema, the blind-ending bifid ureter with double ureteral orifices presents [8].

Although the Y-shaped junction site of the blind-ending branch with the ureter is variable, the majority of the origin is from the lower third ureter. It is rarely from the upper third ureter [12]. The length of the blind-ending branch varies from 1.5 cm to twenty more cm [7].

In our case, the origin of the blind-ending branch is from the middle third ureter which overlaps with the underlying ala of sacrum in radiographs. In this circumstance, the origin of the blind-ending branch is occasionally difficult to be clearly demonstrated and thus one projection of the radiograph is not enough. Different views of intravenous urography could provide more information about the origin of the blind-ending branch. Besides, the anteroposterior view plus the oblique view of intravenous urography could demonstrate the whole course of the blind-ending branch and the length of the blind-ending branch could be measured, which is more than 10 cm in our case.

The majority of cases are diagnosed by intravenous urography or retrograde pyelography [7-9]. However, most cases are asymptomatic through their lives which leads to the low incidence. The blind-ending bifid ureter had been incidentally diagnosed on computerized tomography (CT), while the cross-sectional imaging of the blind-ending branch may be confusing [9].
CONCLUSION

The blind-ending bifid ureter is a rare congenital anomaly of urinary system. Though the true cause is still not clear, the mechanism may be associated with abnormal development of the ureteric bud and failed development of metanephrogenic blastema. Intravenous urography is one of the best modality to diagnose the blind-ending bifid ureter. Different views of intravenous urography help to delineate the origin and the whole course of the blind-ending branch.

REFERENCES

盲枝輸尿管裂及其胚胎發育之相關性：一病例報告

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盲枝輸尿管裂是一種極為少見的泌尿系統的先天異常。我們報告此種先天異常的一個病例：輸尿管裂的起點位在中三分之一的輸尿管。我們討論了泌尿系統在胚胎學上之發育及可能造成此種先天異常的機轉。在靜脈注射泌尿道攝影的檢查中，不同身體姿勢的照相，可以提供更多盲枝輸尿管裂的資訊。在診斷盲枝輸尿管裂的檢查方法中，靜脈注射泌尿道攝影是所有最好的檢查方法當中的其中一種。

關鍵詞：輸尿管異常、靜脈注射泌尿道攝影、輸尿管結石