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A Case of Horse Shoe Kidneys Diagnosed by Computerized Tomography

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Abstract: A 9 years old male scanned by ultra sound (U/S) for , abdomen and diagnosed as abdominal mass. The patient was also scanned by 64 slices Computed Tomography (CT). A Computerized Tomography Urogram (CTU) and Computerized Tomography Angiogram (CTA) revealed that there was horseshoe kidney.
Keywords: U/S, CTU, CTA

INTRODUCTION

In humans the kidneys are located in the abdominal cavity, more specifically in the para-vertebral gutter and lie in a retroperitoneal position at a slightly oblique angle. There are two kidneys ,One on each side of the spine[1]. The right kidney being slightly lower than the left, and left kidney being located slightly more medial than the right[2-3].

The development of the kidneys happens in three stages: pronephros, mesonephros and metanephros. The last of these three phases will occur around the fifth week of gestation[4]. The kidneys migrate from the pelvis where they are formed and ascend to the retroperitoneal space in the upper right and left quadrants. It is during this critical time in the early stages of formation and ascension that most of the malformations occur. These renal anomalies are a result of the interruption of the normal migration of the kidney. That is what is thought to happen with the horseshoe kidney. O'Brien et al states[5] . At this stage, the renal capsule has not matured and the kidneys still lie within the pelvis. It is suggested that abnormal flexion or growth of the developing spine and pelvic organs brings the immature kidneys together for a longer period than usual, leading to fusion of the two renal elements and hence forming the so-called horseshoe kidney.

Fig-1: CT Urography shows normal kidneys.

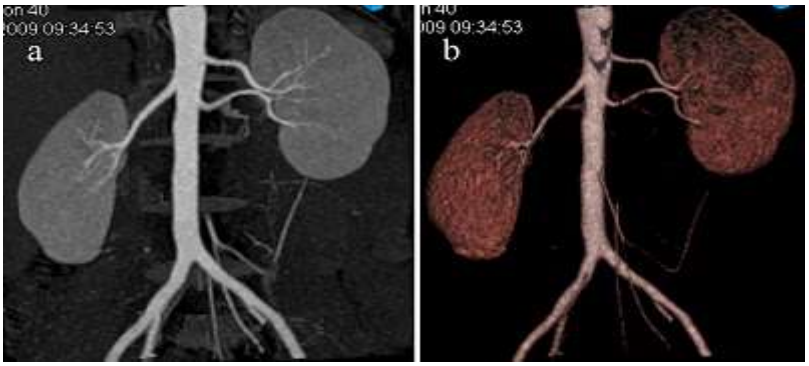

Fig-2: CT Angiography shows normal vasculature of kidneys.

Computed Tomography Uurography is a technique for the evaluation of urinary system[6]. Computed Tomography Angiography (CTA) is a noninvasive modality for evaluating the vascular system and planning treatment strategies[7].

Here we are reporting a case of Horse shoe Kidneys Diagnosed by Computed Tomography Urography and Computed Tomography Angiography.

CASE REPORT

A 9-years old male was referred to the CT department complaining of back pain, and abdominal pain. The clinical examinations suggest that there is abdominal mass. The patient was scanned by 64 slices Computed Tomography (CT) and the images of the patient are shown below in Figure 1&2.

CTU and CTA revealed that there were fused lower pole of the both kidneys just anterior to the body of the lumbar spine Figure 3&4.

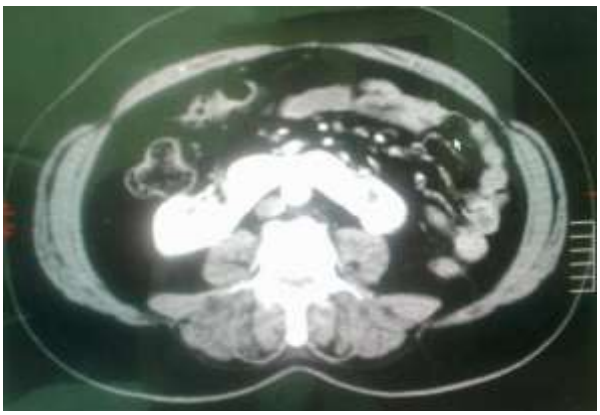

Fig-3: Axial CT shows horse shoe kidney.

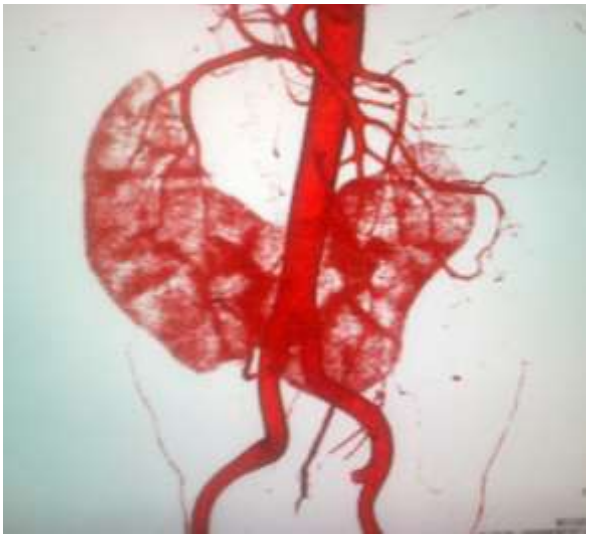

Fig-4: **3D CT Angiogram shows horse shoe kidney.**

DISCUSSION

Renal fusion anomalies, of the kidney, in which both kidneys are fused together in early embryonic life, are rarely encountered. They may be partial or complete. Partial renal fusion is represented by the horseshoe kidney and crossed renal ectopia with fusion. Cake kidney is an anomaly characterized by the complete fusion of both kidneys; it accounts for only 2% of fused kidneys [8]. Renal fusion anomalies occur predominantly in males[8].

Horseshoe kidney is the most common fusion anomaly in the kidney and occurs in about 1 in 400 people, or about .25%. It is also twice as likely to occur in males as in females[9]. Although it is not highly common, it isn't uncommon either. Normally one-third of the patients that have horseshoe kidney are asymptomatic, and the condition is noticed incidentally on radiologic examination[10] . Although most patients are asymptomatic, there are certain conditions that go with horseshoe kidney quite frequently.

The modalities of choice for studying a horseshoe kidney are computed tomography (CT) or magnetic resonance imaging (MRI) or even initially by

ultrasound examinations. CT is more commonly used to examine the condition because it allows precise observation of the anatomy as well as evaluating possible complications. Additionally, with CTA, vascular anatomy of the kidney will be well demonstrated [5].

The early diagnosis of complications that can accompany this anomaly must be made to prevent permanent renal damage. In this study we report our experience with multidetector computed tomographic (MDCT) urography for the anatomic demonstration of renal fusion anomalies [11].

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