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A Case of Horseshoe Kidney

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Abstract

The present report describes a case of malformation of the kidney of the type known as horseshoe kidney found in a middle-aged male cadaver ,who was brain death and organ transplants autopsy was to For patients who need organ transplants were, we identified a horseshoe kidney arrested lower to the inferior mesenteric artery.

On dissection, the kidneys were fused inferior poles, both hila were wide and the kidneys had bilateral duplicated renal arteries and ureters and one artery for isthmus that originates from abdominal aorta. Horseshoe kidneys was be associated with bilateral urinary system.

Introduction

The horseshoe kidney is the most common type of renal fusion anomaly. Horseshoe kidney occurs in about 1 in 500 children. Less than 0.3% of the general population has horseshoe kidneys [1]. Horseshoe is more frequently encountered in males. The vast majority of cases are sporadic, except for those associated with genetic syndromes [2]. The horseshoe kidney is susceptible to medical renal disease. It occurs during fetal development as the kidneys move into their normal position in the lumbar area. With horseshoe kidney, however, as the kidneys of the fetus rise from the pelvic area, they fuse together at the lower end or base. By fusing, they form a "U" shape, which gives it the name "horseshoe". One-third of people with horseshoe kidney will have at least one other problem or complication such as the following:

Kidney stones, Hydronephrosis, Wilmstumor (This embryonic tumor of the kidneys usually occurs during early childhood), Kidney cancer, or polycystic kidney disease, various cardiovascular, gastrointestinal, or skeletal problems [3].

Horseshoe kidney can occur alone or in combination with other disorders.

Case Report

The present report describes a case of malformation of the kidney of the type known as horseshoe kidney found in approximately a 31 year old man who was brain death and organ transplants autopsy was to move to the transplant candidate members. Both the kidneys were joined at their lower poles by an isthmus located in front of third and fourth lumbar vertebrae. The inferior mesenteric artery was hindered ascent of kidney (Figure 1).

Figure 1: Horseshoe kedney1-fatty tissue (extra peritoneal layer) around kidney 2- abdominal aorta artery.

The connecting bridge was well-developed, measured about 35 mm x 31 mm size and consisted of renal tissue (Figure 1). The maximum widths of right and left kidneys were 34 mm and 32 mm respectively. The maximum length (distance superior pole of right to superior pole of left- kidneys) was 276.49 mm.

Hilum of each kidney opened anteriorly and ureters passed anterior to the connecting bridge and entered the urinary bladder normally.

Both right and left renal veins opened in to the inferior vena cava and were found normal. Inferior mesenteric artery was running anterior to the isthmus making a deep groove on superior margin of it (Figure 2).

At the level of L5 vertebra, two separate renal arteries originated from the right side of the aorta. They passing behind inferior venacava and entered the upper part of right hilum. At the same vertebral level one left renal artery originated from the left side of abdominal aorta. It entered into the upper part of left hilum. Below the isthmus at the level of L5 vertebra one artery originated from the front of the bifurcation of the aorta. Out of these one artery having entered directly the upper

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Figure 1: Horseshoe kidney 1) Fatty tissue (extra peritoneal layer) around kidney, 2) Abdominal aorta artery.

Figure 2: 1) Inferior mesenteric artery, 2) Ureter in hilum of right part of horse shoe kidney.

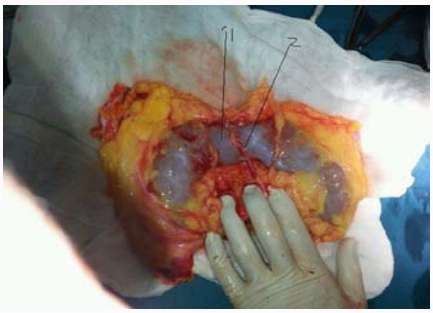

Figure 3:1) Isthmus part, 2) Special artery from aorta for isthmus part.

part of anterior surface isthmus (Figure 3) of the Right ureter with a distance of 5 cm from the upper pole of the kidney exit from right hilum and placed on the anterior surface (bridge) isthmus of kidney and goes into the bladder. Left ureter with a distance of 7 cm from the upper pole of the kidney (close of bridge) exit from left hilum and placed in kidney tissue of anterior surface it's and goes into the bladder.

Other obvious external malformation was found that there was lobulated kidney. This is a type of fetal abnormalities in the kidneys that cannot be merged lobules of kidney and kidney remain to the embryonic state that not uniform appearance and lobulated have been formed.

Discussion

Horseshoe kidney is a rather common abnormality and is found in 1 of about 500 people. It includes two kidneys are located on each side of the mid line, connected at the lower poles by functioning renal parenchyma or fibrous tissue that the bridge connection isthmus [4].

There are three theories about the formation of horseshoe kidney in the first theory suggests deploy alternative during organogenesis lower poles closer together and connect them together is a fusion of mechanical causes. The theory of mechanical fusion is valid for horseshoe kidneys with a fibrous isthmus [5,6].

But this theory is not responsible for the renal parenchyma tissue so the theory has been proposed and recent studies have confirmed it. And the second theory suggests that during their ascent, the kidneys pass through the arterial fork formed by the umbilical arteries, but occasionally one of them fails to do so. It then remains in pelvis close to the common iliac artery. Sometimes both kidneys are pushed so close together during their passage through the arterial fork that the lower poles fuse. This results in the formation of a horseshoe kidney.

Researchers believe that in the renal parenchyma tissue isthmus is the result of a teratogenic event. Number of Posterior nephrogenic cells has migrated to midline which then coalesces to form the isthmus. This teratogenic event may be responsible for other defects, congenital anomaly and neoplasias that seen with horseshoe kidney [7].

Horseshoe kidneys usually located at the level of the lower lumbar vertebrae, since at ascent prevented by the root of the inferior mesenteric artery, the ureters arise from the anterior surface of kidney and pass ventral to the isthmus in a caudal direction.

Horseshoe kidneys may be found at any location along the path of normal renal ascent from the pelvis to the mid abdomen. The kidneys may be lower than normal because the isthmus is tethered by the inferior mesenteric artery during renal ascent. It is posterior to these vessels or runs between them. The isthmus usually lies anterior to the great vessels, at the level of the third to fifth lumbar vertebra. It usually is not the posterior of great vessels or between them [8].

Arteries that feed it have a different origin that can aorta, common iliac and internal iliac and inferior mesenteric arteries. Also the blood supply to the isthmus may originate from the aorta, the iliac or inferior mesenteric arteries. In 30% of cases there are bilateral single renal hilar arteries and in 70% of cases, various combinations of single and multiple renal hilar vessels are seen in 65% of cases, isthmus not have a separate blood supply and in 65% of cases is supplied by a branch from the aorta common, iliac or inferior mesenteric arteries [9].

In intravenous urography of horseshoe kidney has a characteristic appearance. The renal pelvis incomplete inward rotation which faces anterior, thus collecting tubules is deviated inward to the lower poles and Isthmus Bridge and drain off all the urine is impaired due to the angle of the ureters.

When visualised with cross-sectional imaging (CT or MRI) there is essentially no differential. On ultrasound care must be taken to not mistaken a horseshoe kidney for a midline retroperitoneal mass, or to underestimate the length of the kidney. Other diagnoses are cross-fused renal ectopia, pelvic kidney and malrotated kidney [10].

In this case the kidney *via* the renal parenchyma tissue was connected. Kidneys rotated forward, and had been kept down by the inferior mesenteric artery.

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