Medical Journal of the
Islamic Republic of Iran

Volume 2
Number 3
Payiz 1367
Safar 1408
Fall 1988

IMPORTANT DIAGNOSTIC AND SURGICAL POINTS IN HORSESHOE KIDNEY SURGERY

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ABSTRACT

From April, 1983 until December, 1987, 15 patients with horseshoe kidneys underwent surgery in *Shahid Labbafi Nejad Medical Center*. Pyelolithotomy was done in 11 cases, pyeloplasty in 2 cases, and nephrectomy in 2 cases. Symphysiotomy was performed in 14 of these patients. Preoperative angiography was not done in any of the cases and midline transperitoneal approach was utilized in all of the cases. We consider angiography an unnecessary invasive procedure in the great majority of the horseshoe kidney operations. Midline transperitoneal approach is far superior to flank approach in horseshoe kidney surgery. We also prefer symphysiotomy in these cases, since it improves drainage from horseshoe kidney pelvices.

MJIRI, Vol.2, No.3, 175-178, 1988

INTRODUCTION

The horseshoe kidney is probably the most common of all renal fusion anomalies.[1]

When symptoms due to horseshoe kidney are present, they are usually related to hydronephrosis, infection or calculus formation.

According to Latham and Smith surgical intervention is required in 28% of patients with horseshoe kindeys.[2]

Culp and Winterringer and Dajani used an extraperitoneal flank incision[3,4] but we prefer anterior midline transperitoneal incision because access to isthmus and vascular hemostasis and bilateral operation simultaneously are easier.We also consider preoperative angiography an unnecessary invasive test. Our approaches and results will be discussed.

METHODS AND MATERIAL:

From April, 1983 until December, 1987, 15 patients with horseshoe kidney underwent surgery at *Shahid Labbafi Nejad Medical Center*. 10 were male and 5 were female. Age distribution is shown in Table I.

Table I: Age distribution in 15 patients with horseshoe kidney.

Number	Years
1-10	1
11-20	4
21-30	3
31-40	5
41-50	1
51-60	1

The most common presenting symptoms were pain and hematuria. Urinary frequency, fever and cloudy urine were also seen in some patients (Table II). IVU was done in all of the patients which revealed renal

Table II: Symptoms of 15 patients with horseshoe kidney.

Symptoms	Number
Flank pain	13
Frequency	6
Hematuria	8
Dysuria	7
Fever	6
Enuresis	-
Cloudy urine	3

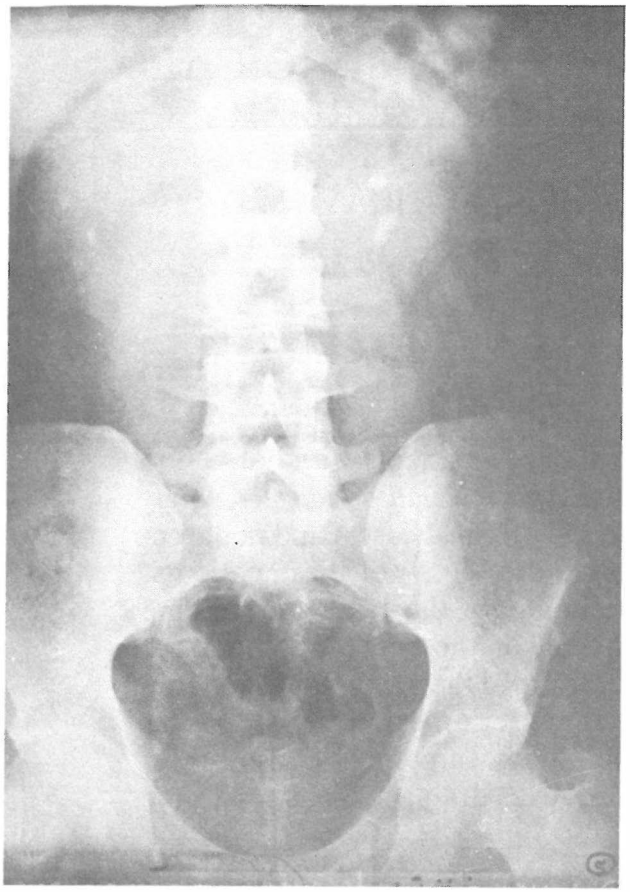

Fig 1 A: Plain abdominal film reveals stones bilaterally within the horseshoe kidney.

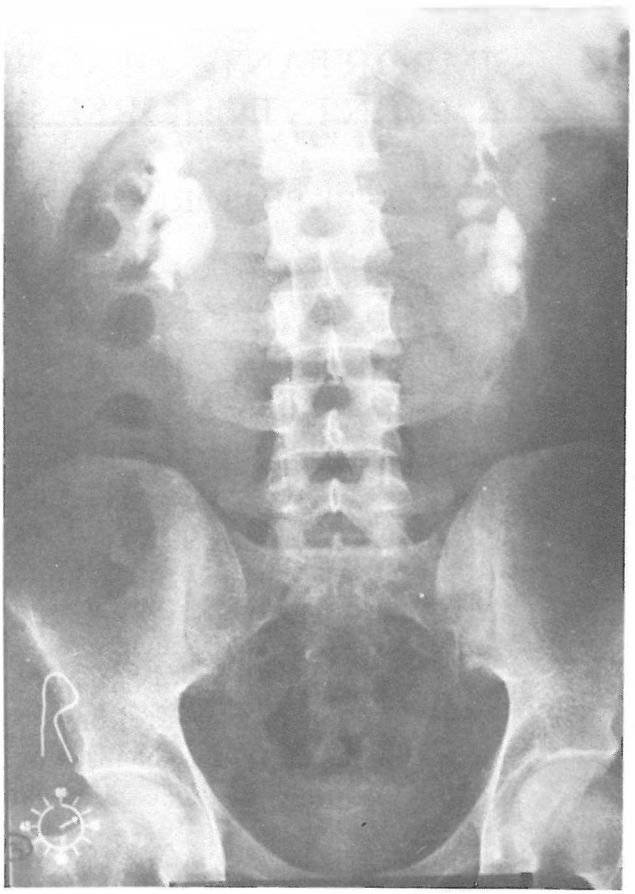

Fig 1 B: Post operative urogram of patient on Fig 1. Lower poles of the horseshoe kidneys are moved laterally to a more normal position with better ureteral drainage.

stone in 12, nonfunction kidneys with stone in 1, and UPJ stenosis in 2 (Table II).

Renal angiography which is usually performed as a preoperative measure was not done in any of our patients. Midline transperitoneal incision was used in all of the cases. Posterior peritoneum was incised and isthmus was easily identified. Renal pelvices of the involved side were found with no difficulty and since it was always located well anterior, we could identify vessels easily, mostly located superior to pelvis, leaving quite enough bare pelvis for pyelotomy. Pyelolithotomy was performed in 11 patients. In two patients unilateral nephrectomy was performed, in one due to nonfunction stone containing unit and in the other the cortex was very thin due to severe hydronephrosis (Table III).

Symphysiotomy (division of isthmus) was performed in 14 of 15 patients (Fig 1, 2) to improve the drainage from the kidneys. Pyeloplasty was done in 2 patients with ureteropelvic junction stenosis. Ureteral reimplantation was done simultaneously in one case during pyeloplasty (Table IV).

Table III: Associated problems in 15 patients with horseshoe kidney.

Problems	Number
Unilateral Hydronephrosis	5
Bilateral Hydronephrosis	2
Renal Stones	12
Recurrent Renal Stone	1
Pyonephrosis	5
Urinary infection	8

Table IV: Operative procedures perfomed in 15 horseshoe kidneys.

Operation	Number
Pyelolithotomy	11
Pyeloplasty	2
Nephrectomy	2
Symphysiotomy	14
Nephrostomy	3

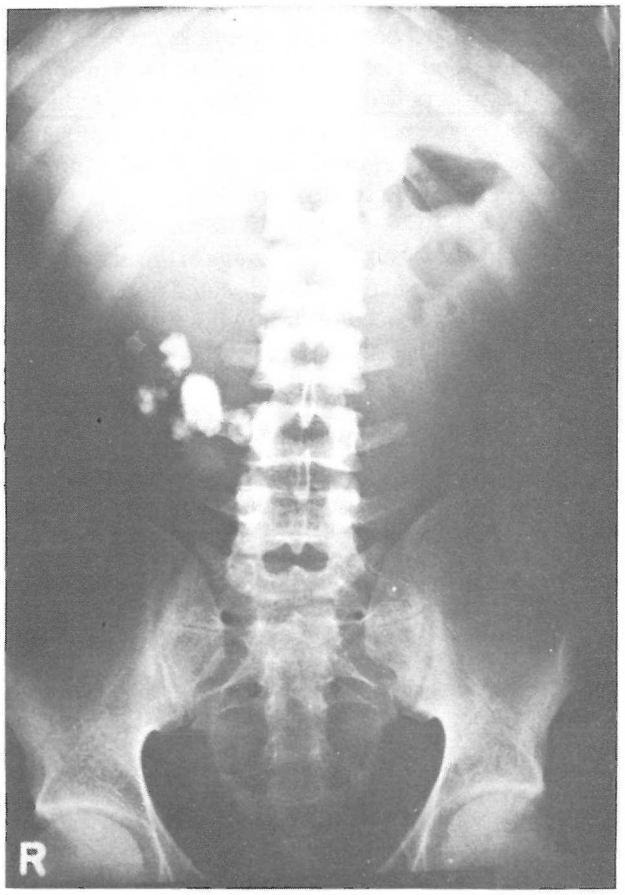

Fig 2 A: Staghorn calculi in a patient with horse shoe kidney

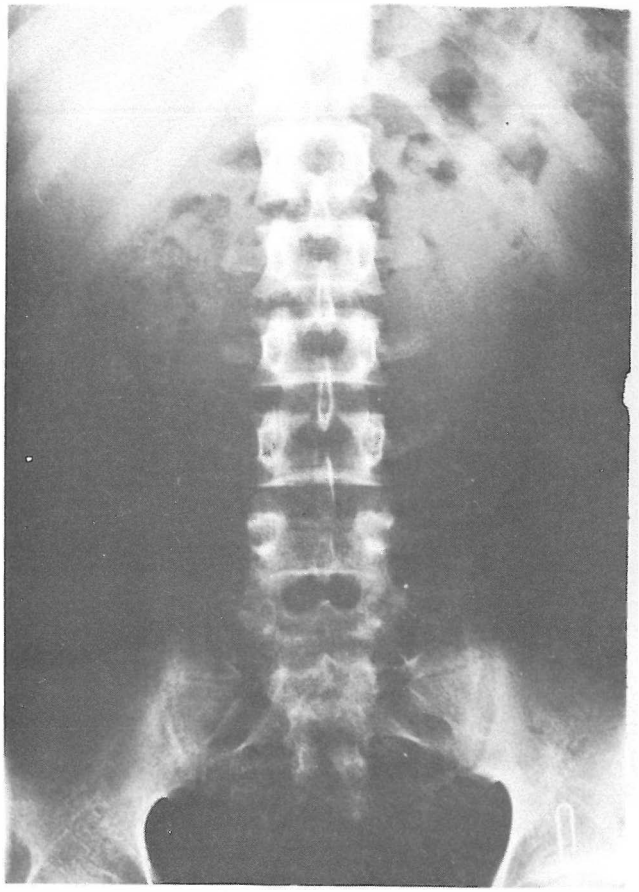

Fig 2 B: Post operative plain film of the patient shown in Fig 2 A

RESULTS

As mentioned before, removal of stone during pyelolithotomy was performed easily because proper anatomic approach is achieved by midline instead of flank approach. Better ureteral drainage occurred due to routine symphysiotomy. Only one urinary fistula and ascites occurred which was easily evacuated without clinical peritonitis. No other complication was noted related to the incision.

DISCUSSION

Horseshoe kidney is an embryologic anomaly in which kidneys are attached together at their lower pole within the 4th to 8th week of fetal life.[1] This occurs before the normal ascent and rotation of the kidneys, causing the horseshoe kidney to have a lower position with renal pelvices staying anteriorly. Isthmus consists of renal parenchyma in the majority of the cases. Rarely it is composed of fibrotic band.[2] Blood supply to the kidneys are quite variable and only in 30% of the cases there is one main artery.[5] Ureters are usually joined to renal pelves at a higher level which together with abnormal vasculature could disturb urine flow from pelvices down the ureter.

Some investigators advocate preoperative angiography before surgery on the horseshoe kidney.[6] We found out that preoperative angiography is an unnecessary invasive procedure in the evaluation of patients with horseshoe kidneys. Flush aortogram with many vessels seen on the film, does not add any important information for surgical planning and since vessels to horseshoe kidney are usually multiple with different origins, selective angiography is difficult to perform. So we did not do angiography in any of our cases. In fact nothing more than adequate surgical attention is necessary in this regard, to avoid vascular injury. We would consider midline transperitoneal approach the best approach in the majority of the surgical procedures for the horsehoe kidney. Others have pointed this out also (Culp, Dahlen).[6,7] By using this incision approach to isthmus is easier and better control of vascular supply is achieved. Simultaneous procedures on both kidneys are feasible. The most important point is that access to renal pelvices is much easier, because the pelvices are located anteriorly.

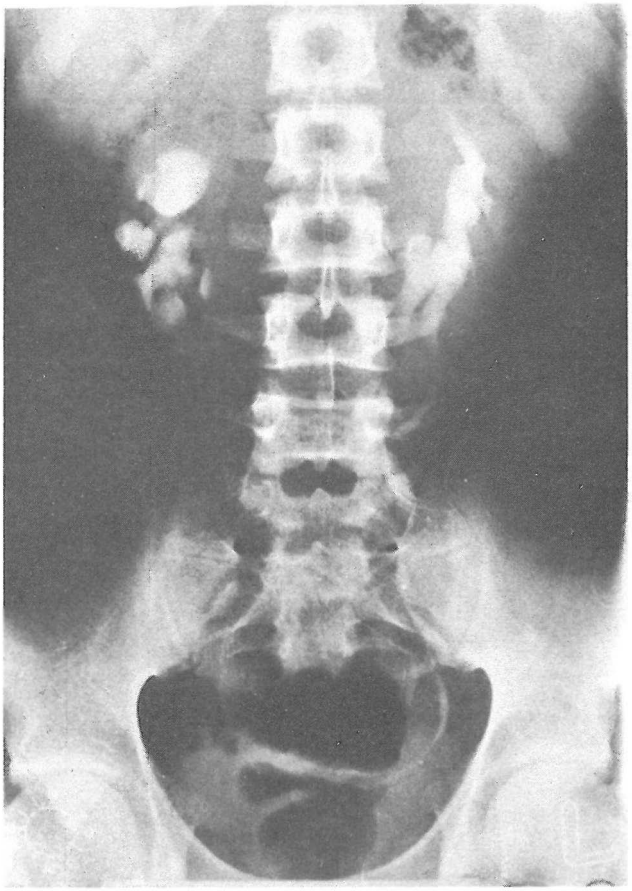

Fig 2 C: Post operative urogram of patient on Fig 2 A. Following midline approach and stone removal from right kidney pelvis, isthmus also was divided, leading to better ureteral drainage.

That is why flank approach is quite improper in getting access to renal pelvices of horsehoe kidneys. This is more understood when one considers that fusion of kidneys in lower pole does not permit moving kidneys. We have come across patients with stone and horseshoe kidneys operated via the flank approach without being able to remove the stone.

Symphysiotomy (division of the isthums of the horseshoe kidney) helps the drainage of the urine out of the pelvices because ureters are located anterioly. We recommend this procedure following pyelolith otomy or pyeloplasty in horseshoe kidneys.

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