

PELVI-URETERIC JUNCTION OBSTRUCTION IN CHILDREN

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ABSTRACT

- Objectives* To find out modes of presentation and treatment for primary pelvi-ureteric junction (PUJ) obstruction in children.
- Study design* Descriptive study.
- Place & Duration of study* Department of Paediatric Surgery Chandka Medical College Hospital Larkana, from June 2003 to June 2008.
- Patients and Methods* All patients who were diagnosed as primary pelvi-ureteric junction obstruction were included in the study. Urine D/R and C/S, blood urea and creatinine, ultrasound, IVU and radio-isotope renal studies were performed in all cases. All underwent open surgery.
- Results* A total of 25 patients (15 male and 10 female) were managed. The age of patients ranged from 2 months to 13 years (mean 4.6 years). Left side was involved in 13 patients, right side in 11 and 1 patient had bilateral pelvi-ureteric junction obstruction. The clinical presentations were abdominal mass, pain abdomen and urinary symptoms. Twenty two patients underwent Anderson-Hynes pyeloplasty while nephrectomy was done in 3 cases. All patients who underwent pyeloplasty recovered uneventfully except three who developed prolonged extravasation of urine. One patient developed wound infection. Average hospital stay was 10 days. Follow up studies showed good renal function on the side of pyeloplasty in 20 cases.
- Conclusions* Pelvi-ureteric junction is common site of obstruction in the upper urinary tract. Post operative recovery of renal function is achieved in majority of patients using Anderson-Hynes pyeloplasty.
- Key words* Pelviureteric junction obstruction, Urinary tract obstruction, Anderson-Hynes pyeloplasty.

INTRODUCTION:

Pelvi-ureteric junction is the most common site of obstruction in the upper urinary tract. It occurs nearly 1 in 500 to 1:1250 live births.^{1,2} There are two types of pelvi-ureteric junction obstruction (PUJO), the extrinsic and much common intrinsic variety.³ The main indications for active intervention are to relieve pain, relieve obstruction and / or treat pathologies secondary to such

obstruction like calculi and infections.⁴

Many surgical techniques have dominated urologic practice in this field for more than a century. These techniques include Foley's VY plasty, Anderson-Hynes dismembered pyeloplasty (open and laparoscopic approach) and more recently endopyelotomy and robotic surgery also added into its armamentarium.⁵ All techniques and approaches have various advantages as well as disadvantages.

Very little data is available on the subject especially in paediatric population from our country. This study was undertaken to describe our experience of this anomaly.

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PATIENTS AND METHODS:

A study was conducted in the department of Paediatric Surgery Chandka Medical College Hospital Larkana from June 2003 to June 2008 to find out various modes of presentation of primary PUJO, treatment offered and results obtained. The data collected both retrospectively and prospectively. All patients who were diagnosed as primary PUJO were included in the study. Patients who presented with PUJO secondary to stones, adhesions or external compression were excluded.

All patients were subjected to routine investigations like blood complete picture, urine detailed report, blood urea, serum creatinine, urine culture and sensitivity, ultrasound, radio-isotope renal studies and intravenous pyelogram. Based upon functional status of the kidneys decision was taken for pyeloplasty and nephrectomy. Parents were counseled before surgery.

Pyeloplasty was performed using Anderson-Hynes dismembered technique. The affected kidney was approached through flank incision using extraperitoneal route. After identifying the pelvi-ureteric junction the redundant pelvis of the kidney was excised. Repair was then performed over a stent (feeding tube no.8 Fr) using the polyglactin 5/0 suture. A perinephric drain was also kept. The stent was removed on 8th post operative day and drain after cessation, if any, of extravasated urine.

RESULTS:

During the study period 25 patients were managed, 15 (60%) males and 10(40%) females. The age of patients ranged from 2 months to 13 years, with the mean of age of 4.6 years. The majority (n 14 - 56%) belonged to age group of 2-5 years. Right side was affected in 11(44%) patients while left side in 13(52%) and 1 patient (4%) had bilateral PUJO. One (4%) patient had coexisting vesicoureteric junction obstruction on the same side.

The clinical presentation included pain abdomen in 44%, mass abdomen 24%, urinary symptoms in 16%, and stones in 12%. Sixteen patients also had history of haematuria. Anderson-Hynes dismembered pyeloplasty was performed in 22(88%) patients (primarily in 21 patients while in one patient after percutaneous nephrostomy). Nephrectomy was done in 3(12%) patients (primarily two and one after percutaneous nephrostomy).

Percutaneous nephrostomy was done in two (8%) patients, one improved and subsequently pyeloplasty was performed while other patient ended up in nephrectomy. Three patients (9.4%) developed prolonged extravasation of urine, one of them required ureteric catheterization while 2 improved with conservative measures. One patient developed wound infection. The hospital stay ranged from 10 days to 19 days.

DISCUSSION:

Pelvi-ureteric junction obstruction is the most common site of obstruction in the upper urinary tract. It is defined as an obstruction to the flow of urine from renal pelvis to the proximal ureter. As a result of back pressure within renal pelvis, a progressive renal damage and deterioration sets in. Wide spread use of ultrasonography and the advent of modern imaging techniques have resulted in earlier diagnosis of PUJO.⁵

Various surgical techniques, open and minimally invasive, have been used for correction of PUJO. In 1949 Anderson and Hynes published their experience with an operation that included complete transection of the upper ureter, subsequent spatulation of the ureter and trimming of the redundant pelvis. This was first described in the management of retrocaval ureter but it was easily adapted for reconstruction of pelvi-ureteric junction obstruction.⁶ With the wide spread use of prenatal fetal ultrasonography, most infants born with PUJO are detected antenatally. The other population is younger children, out of these 25% are diagnosed within first year of life and 50% recognized before the age of 5 years.⁷ None of our patients was having antenatal detection of the condition. The age of diagnosis in our patients varied from 2 months to 13 years with the mean of 4.6 years and majority of our cases (56%) were below the age of 5 years. This is in accordance with the above mentioned study.⁷ This condition occurs more commonly in males⁵ as has been noted in our patients.

The PUJO predominantly affects left side and bilateral obstruction has been reported in 10-40% of patients.^{8,9,10} This is also true for our patients. In some patients PUJO co-exists with vesico-ureteric junction obstruction.¹¹ One of our patients was found to have coexistent vesico-ureteric junction obstruction. The presenting signs and symptoms depend on age of the patient. Infants usually present with a asymptomatic abdominal mass whereas older children present with pain and urinary tract infection. Stones are reported in 2-5% of children with PUJO and rarely haematuria and raised blood pressure may occur.^{7,12} Majority of our patients presented with pain abdomen and asymptomatic mass. The other presentations were recurrent UTI and stones. The presence of stones was on higher side in our cases compared to reported literature.^{7,12} One of our patients had haematuria while none of the patients had hypertension.

The investigations used to diagnose the PUJO are renal ultrasound, IVU and isotope studies.⁴ Ultrasonography demonstrates and measures the degree of pelvic and calyceal dilatation and dilatation of the ureters or thick walled bladder which indicate vesico-ureteric reflux. IVU remains the first line of investigation in many centers. The pattern of hydronephrosis caused by PUJO

has characteristic radiographic appearance i.e dilated pelvi-calyceal system, contrast transition abruptly at the uretero-pelvic junction and ureter either not visualized or found of normal caliber. Radio isotope studies allow the definition of renal perfusion, relative function of each kidney, clearance of isotope from the upper tract and re-ascend in renal areas in late films, which may be an indirect sign of vesico ureteric reflux.¹³

The goals of management of PUJO are to improve urine flow, to prevent further parenchymal damage and to alleviate symptoms. If renogram shows pelviureteric junction obstruction in a kidney, with 15 to 40% split function, an operative pyeloplasty is performed, where the renal function is less than 15 to 20%, it is common to give these kidneys a chance to recover function after temporary relief of the obstruction with a percutaneous nephrostomy.¹⁴ In children, indications for minimally invasive surgery are less clear and therefore endurologic procedures and laparoscopic pyeloplasty are less prevalent.^{15,16} Open pyeloplasty continues to be the gold standard,¹⁷ and dismembered pyeloplasty is most popular with the success rate of as high as 98%.¹⁸⁻²¹

In our series Anderson Hynes pyeloplasty was performed in 22 (88%) patients while 3 patients (12%) underwent nephrectomy on account of poor renal function (less than 10% split function). Temporary diversion of pelvic urine by means of per cutaneous nephrostomy was performed in 2 patients. In one of them the renal function improved and subsequently Anderson Hynes pyeloplasty was performed while in other the renal function did not improved even after 3 weeks and ended up in nephrectomy. This patient also had coexistent vesico-ureteric junction obstruction.

Post operative complications of pyeloplasty include post operative pyelonephritis, delayed opening of uretero pelvic anastomosis, prolonged leak which is defined as extravasation of urine beyond 14 days and late manifestation as progressive worsening of radiographic studies.³ In majority of our patients (84%), the post operative course was uneventful. Post operative ultrasound is obtained approximately 4 to 6 weeks²² after surgery and the functional assessment of anastomosis should be done in 2 to 3 months.²³ Post operative ultrasound and excretory urography revealed satisfactory excretion in 20(90.90%) patients while significant hold up of contrast at pelvi-ureteric junction was observed in 2(9.09%) patients. Our results are comparable with national and international studies.^{10,19,20-22}

CONCLUSIONS:

Pelvi-ureteric junction is common site of obstruction in the upper urinary tract. Post operative recovery of renal

function is achieved in majority of patients using Anderson-Hynes pyeloplasty.

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