



Original Article

POST A-H PYELOPLASTY ANALYSIS OF RENAL FUNCTION IN UNILATERAL HYDRONEPHROSIS DUE TO CONGENITAL PELVI URETERIC JUNCTION OBSTRUCTION

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Abstract:

Background: The objective of this study was to analyze the functional improvement of renal function in terms of split renal function (SRF) & glomerular filtration rate (GFR) by DTPA renogram in early post operative period who underwent A-H pyeloplasty for unilateral hydronephrosis due to congenital pelvi ureteric junction obstruction.

Methods: A prospective observational study was conducted to see the post operative renal function improvement in patient with unilateral hydronephrosis due to congenital pelvi ureteric junction obstruction in department of paediatric surgery, BSMMU from July 2007 to October 2008. All the patients were followed up at 4 weeks interval for 12 weeks.

Results: Total 13 Patients both male & female were observed with age ranging from 03 months to 15 years. Out of 13, eleven patients showed gradual improvement of renal function in terms of SRF & GFR in three successive DTPA renogram done at 4, 8 & 12 weeks post operatively but two patients showed deterioration of renal function in 1st two renogram but improved at 12th weeks period.

Conclusion: DTPA renogram is the best method to see the functional improvement of renal function after A-H pyeloplasty but should be done on 12th post operative day.

Keywords: Post A-H Pyeloplasty, Renal function.

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Introduction:

Hydronephrosis in children is a common abnormality of the kidney which can be defined as an aseptic dilatation of the renal collecting system as a result of either inadequate drainage through the pelvi ureteric junction or retrograde flow of urine. Its incidence is about 1 in 1250 live birth and common in male (ratio 2:1) and 66% occur in left side. Congenital PUJO may be primary or secondary due to crossing vessels, adhesive band, fibro-epithelial polyp etc. that causes intermittent obstruction at PUJO. Primary or idiopathic hydronephrosis is the most common (44%) cause of PUJO.³

Incomplete or intermittently complete urinary outflow obstruction at PUJ at first causes dilatation of the pelvis, fullness and blunting of calyx and finally leads to impairment of renal function as well as significant renal changes in both renal cortex and medulla. Changes that occur in cortex are-tubular dilatation, glomerular sclerosis, decreased renal blood flow, inflammation and fibrosis of renal parenchyma, decreased GFR and medullary changes are hydrostatic distention of renal pelvis and calyces.⁵

Histologically there is congenital deficiency of ureteric smooth muscle at PUJ.² Electron microscope reveals increased collagen deposition between the muscle fibers. This leads to failure of transmission of peristaltic wave across PUJ and absence of propulsion of urine from renal pelvis to ureter.¹

Patients with PUJO mostly present with typical symptoms like abdominal mass, abdominal pain,

recurrent UTI, failure to thrive, haematuria etc but may be diagnosed incidentally among asymptomatic patients. It also may be diagnosed antenatally by maternal USG.¹

Radionuclide study is the most useful informative & sophisticated investigation is the evaluation of hydronephrosis. It can give detail information regarding differential renal function, glomerular filtration rate and drainage function of each kidney and also helpful in follow up study. Out of several tracer use for radionuclide study, DTPA (Di-ethylene triamine penta acetic acid) is most widely used tracer for several reasons. It is a small molecule that is exclusively filtered by the glomeruli, is neither secreted nor reabsorbed by renal tubules and 95% of tracer is excreted through urine within 24 hours and no retention of compound had been demonstrated in the kidney. It is cheap, easily available and has no documented side effects.³

Out of several types of operative procedure for hydronephrosis Anderson-Hynes pyeloplasty (A-H) is the gold standard operative procedure. The objective of surgery were to relieve symptoms, correct or improve the hydronephrosis and prevent further renal deterioration.⁴

Methods:

The study was designed as a prospective observational study after proper approval from the authority. A total of 13 patients both boys & girls from 03 months to 15 years of ages with unilateral hydronephrosis due to congenital PUJO were included in this study. The study was conducted from July 2007 to October 2008, under department of paediatric surgery, BSMMU, Dhaka. Patients with bilateral hydronephrosis, hydronephrosis with associated renal anomalies like horse-shoe kidney, ectopic kidney, solitary kidney etc and secondary hydronephrosis were excluded from the series.

All patients were preoperatively assessed by DTPA renogram and post operatively they were also assessed by DTPA renogram every four weekly for consecutive 3 months to see split renal function and GFR whether improving, static or deteriorate.

Results:

A total of 13 patients both boys(11) and girls (2) with age ranging from 3 months to 15 yrs were included in this study. Out of 13 patients. 4 were antenatally

diagnosed, 7 were symptomatic and 2 (two) were incidentally detected. Left sided PUJ involvement was in 7 patients and right sided was in 6 patients. All patients underwent A-H pyeloplasty and post operative periods were uneventful. Preoperative mean value of split renal function was 21.15 ± 9.45 and post operative mean value at 4th weeks was 31.62 ± 7.75 , at 8th week was $35.5410.76$ and at 12th week was $39.319.24$. Pre operative mean value of GFR was $17.99.74$ ml/min and post operative mean value of GFR were $25.847.91$, $32.488.85$ & $36.118.70$ at 4th, 8th & 12th weeks respectively.

Discussion:

A number of methods has been applied to measure the post operative results of A-H pyeloplasty including clinical status, IVU, USG and diuretic renography. Despite improvement in symptomatology following A-H pyeloplasty radiographic improvement in hydronephrosis has often been lacking. Though IVU and USG does not demonstrate clearly the improvement after operation but diuretic renography clearly demonstrate the early and subsequently improvement.

In this study we evaluated the renal function in terms of split renal function and GFR by DTPA renogram on 4th, 8th & 12th week post operatively. Out of 13 patients, 11 showed gradual improvement of renal function in consecutive three follow up both in SRF & GFR. In 2 patients renal function deteriorate in initial two follow up that is at 4th & 8th weeks but improved at 12th weeks follow up. This study has shown that improvement of mean SRF from 21.2% to 39.3% and mean GFR from 17.1 ml/min to 36.1 ml/min.

In our study, improvement of renal function occur in majority of patients. Those who were symptomatic, those were younger (age<60 month), those diagnosed antenatally, those corticomedullary differentiation not lost and those operation done within short period after diagnosis they showed much improvement after A-H pyeloplasty.

Previously no one have seen post operative renal function at 4th & 8th weeks by DTPA renogram. All of them did the renogram at 12th weeks. So, this result is compared with the other results only at 12th weeks but not with the initial two follow up i.e, at 4th & 8th weeks.

A-H pyeloplasty is the choice of operative procedure⁶. Because it improve post operative pelvi ureteric

drainage time, reduce pelvicalyceal dilatation, improve renal tubular function, eliminate clinical sign & symptom related to obstruction and prevent further renal deterioration.

Conclusion:

A-H Pyeloplasty is the gold standard operative procedure for hydronephrosis and radionuclide study (DTPA renogram) is the best method of investigation for follow up. Renal function & post operative changes settled down 12 weeks after operation, so a 12th weeks DTPA renogram is significant for post operative assessment after A-H pyeloplasty.

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