

SECONDARY URETEROPELVIC JUNCTION OBSTRUCTION: ENDOPYELOTOMY A BETTER OPTION

Tariq Ahmad

Institute of Kidney diseases,
Hayatabad, Peshawar - Paki-
stan.

Address for correspondence:
Dr. Tariq Ahmad

Institute of Kidney diseases,
Hyatabad, Peshawar - Paki-
stan.

E-mail: dr_tariqahmad@yahoo.
com

Date Received:

May 15, 2014

Date Revised:

October 24, 2014

Date Accepted:

November 30, 2015

ABSTRACT

Objective: To evaluate the outcome of percutaneous antegrade endopyelotomy as a primary intervention for Secondary Ureteropelvic junction (UPJ) obstruction.

Methodology: This study was conducted from 20th January 2011 to 19th January 2012 at Institute of Kidney diseases, Hayatabad, Peshawar. A sample of 31 cases having evidence of secondary ureteropelvic obstruction were listed for the study of which 21 cases as males and the rest females. Ultrasound, intravenous urogram and DTPA Scan were carried out. Patients with severe hydronephrosis, renal function <30%, anterior crossing vessel and UPJ >2 cm stenosed segment were not included in the study. Stenosed segment was incised posterior-laterally until periureteral and peripelvic fat was visualized. At completion of 8 weeks postoperatively the ureteric stents were removed as day cases and the patients were evaluated at follow-up of 3 months and every subsequent 6 months in the out-patient department with data relevant collected on a predesigned proforma.

Results: Demographically the findings were observed and mean age at both sexes was similar. The mean split GFR on the affected side was 36.5 mg/ml. The average time taken to completion of the procedure was 63 min. Hospital stay averaged 3.8 days (ranging from 2–6 days). Success rate was 81% (25 of 31) at 10.25 months. Failure was noted clinically in 6 cases with presentation variably at completion of first to the third month postoperatively.

Conclusion: Percutaneous antegrade endopyelotomy has significant advantages in term of reduced hospital stay, shorter operative time, early postoperative recovery, minimal morbidity and decreased postoperative analgesic requirements. It is successful in selected patient who have good renal functions, no crossing vessels, mild to moderate hydronephrosis and dependent ureters.

Key Words: Percutaneous antegrade endopyelotomy, Ureteropelvic junction (UPJ) obstruction, Minimal invasive management, Anterior crossing vessel

This article may be cited as: Ahmad T. Secondary ureteropelvic junction obstruction: Endopyelotomy a better option. *J Postgrad Med Inst* 2015; 29(4): 215-8.

INTRODUCTION

Lack of adequate flow of contrast from the renal pelvis to the ureter on imaging studies is diagnostic of an Obstruction of the Ureteropelvic junction (UPJ). It may be due to nephrolithiasis, previous surgery, ureteral surgery, retroperitoneal fibrosis, or extrinsic compression due to surrounding inflammation or even a mass effect¹. Several management options are available, including open surgery, antegrade and retrograde endourologic techniques, and laparoscopic repair²⁻⁴. Conventionally the various pyeloplasty procedures are considered the armamentarium of urologists in tackling this kind of obstruction^{5,6}. Over the last few decades significant progress in endoscopic urological procedures have paved way to introducing lesser demanding procedures

with little trauma and post-operative pain⁷. These include Percutaneous Antegrade Endopyelotomy (PAE), Cautery Wire Balloon Endopyelotomy and Ureteroscopic Endopyelotomy. Their safety having documentation by literature in terms of feasibility and success^{1,8}. Ramsay and colleagues⁹ in 1984 were pioneers to the endoscopic management of the disease in discussion as a "percutaneous pyelolysis" followed by Badlani and coworkers¹⁰, that familiarized the north American continent with the term Endopyelotomy. Endoscopically the procedure involves transmural incision of the ureteric wall till the perirenal fat and surrounding tissue is visualized and by principal devised by Davis a stent is left in situ for a long duration post-operatively. The defect is later left for nature to nurture and the layers of the ureter are regenerated achieving what what would oth-

erwise be possible with more invasive procedure such as pyeloplasty^{11,12}.

Narrowed portion greater than 2cm in length or an existing infection are not rendered as candidates for the procedure. The rationale of this study is to determine the benefit of subjecting patients to lesser trauma in an already compromised pelvis (secondary).

METHODOLOGY

This case series was conducted from 20th January 2011 to 19th January 2012 at the Institute of Kidney diseases, Hayatabad, Peshawar. A sample of 31 cases having evidence of secondary ureteropelvic obstruction were listed for the study of which 21 cases as males and the rest females. Intravenous urogram and DTPA Scan were performed for each patient. Patients with differential split renal function <30% by DTPA scan were not included in the study. On table retrograde pyelogram was performed for every patient to quantify the length of the narrowed segment and also to rule out a possible extraluminal cause of narrowing such as an acute posteriorly directed ureteral outline suggesting a crossing vessel. Patients with anterior crossing vessel and UPJ > 2 cm stenosed segment were not included in the study. Severe hydronephrosis was defined as the loss of renal cortex with dilated pelvicalyceal system. Only a single operating surgeon was identified but was blinded of the results of the study. Following induction of anesthesia the operating surgeon would first pass a ureteric guide or glide wire and a rigid ureteric catheter before shifting the patient to the prone position. After the injection of contrast through ureteric catheter percutaneous nephrostomy tract was made under fluoroscopy. Stenosed segment was incised posteriolaterally until periureteral and peripelvic fats were visualized. A JJ stent was placed for a period of 8 weeks post-operatively as was an already clamped nephrostomy tube (1st postoperative day). Following clamping the nephrostomy tube was removed 6 hours when the patient had no complaints and was asymptomatic. At completion of 8 weeks post-operatively the ureteric stents were removed as day cases and the patients were evaluated at follow-up of 3 months and every subsequent 6 months in the out-patient department with data relevant collected on a pre-designed proforma.

The success of procedure is defined when there is no resistance elicited on a repeat DTPA scan at the previously narrowed segment. Failure is inversely any evidence of resistance to flow at the previously narrowed segment on the repeat scan after diuretic phase at 3 months.

RESULTS

Demographically the findings were observed and

mean age at both sexes was similar. The mean split GFR on the affected side was 36.5 mg/ml. The average time taken to completion of the procedure was 63 min ranging from 45 min to 2 hours. Hospital stay averaged 3.8 days (ranging from 2–6 days). No significant operative or post-operative morbidity was documented during the course of the study. Two patients underwent simultaneous stone extraction from the renal pelvis at the same time. Success rate was 81% (25 of 31) at 10.25 months (average follow-up). At first Follow up visit DTPA was equivocal in 2 cases. In these, a repeat DTPA at second follow up visit was normal. Failure was noted clinically in 6 cases out of which 5 were symptomatic and one was asymptomatic. Those patients culminating in a failed procedure had an average time of presentation at 1.6 months that presented between the 1st and the end of the third month. Three of the six patients presenting with failure underwent an open pyeloplasty whereas the remainder were subjected to placement of JJ stents for a longer duration. Exception was in one case that proved as a nonfunctioning renal scan had to undergo a nephrectomy.

Apart from those labeled as failed procedure another patients that was symptom free showed a post-operative DTPA scan with resistance to flow of urine that was subjected to Anderson Hyens pyeloplasty.

DISCUSSION

Today (PAE) is widely accepted as a primary treatment for correction of UPJ Obstruction^{13,14}. In the past this (PAE) was subjected as a conservative approach to a failure of a more invasive pyeloplasty procedure. However, due to the increase in success rate and refinement of procedure many urologists prefer percutaneous antegrade endopyelotomy (PAE), as first-line modality to treat for all cases with the disease. The advantages of (PAE) include significantly reduced hospital stay, shorter operative time, early postoperative recovery, minimal morbidity, decreased postoperative analgesic requirements and lesser trauma. One survey ascribed nearly half of all American urologists to opt for PAE as primary modality of treatment for the UPJ obstruction¹⁵.

The argument of another endoscopic option is the pyeloplasty performed laproscopically that has evidence of better success rate than PAE with literature suggesting up to 100% success. But the benefits of reducing trauma and less steeper learning curve to acquiring skill in management of UPJ obstruction makes PAE a favorable option^{16,17}. If the procedure is unsuccessful, there are no adverse outcomes of following the management with a pyeloplasty⁵.

In our unit the success rate of (PAE), was 81% which is comparable with the most published studies¹⁸. Bodo E Knudsen¹⁹ conducted a study on 80 patients over a

period of 10 years. In his study the overall success rate for secondary UPJ obstruction was 74%. His success rate was almost similar to the success rate of our study. Similarly in a retrospective audit conducted by NJ Rukin¹ over a period of over 4 years showed results for PAE with a 79% radiological improvement having followed up with post-operative DTPA scans performed on completion of 3 of 3 months and 93% overall improvement of symptoms. Pratipal Singh²⁰ performed a study comparing the outcomes of the laproscopic variant of pyeloplast versus the option under discussion with profoundly depressed renal function. In his study the success rate for endopyelotomy was 78.26% which was lower than laparoscopic surgery group (100%). In the same way the success rate of Stephen J Savage²¹ was 83%, which is almost similar to our results.

6 out of 31 patients failed to show radiological improvement on three months DTPA scan. Five patients were symptomatic and presented with pain 1 to 3 months after stent removal. One patient was not symptomatic but showed obstruction on repeated DTPA scan.

The presence of a crossing vessel is somewhat controversial. On the contrary Van Cangh et al²² have documented an aberrant artery as the cause for a significant failure having compared the presence or absence of the extraluminal obstruction which objectively differed with the study conducted by Gupta et al²³. which included a larger series with very little evidence of an aberrant vessel (<5%). In the current study we excluded patients with UPJ obstruction caused by vessels. We performed retrograde pyelography to show the typical appearance of anterior crossing vessels. In the failed 6 patients, anterior crossing vessels were confirmed in two patients during open pyeloplasty. Weiping Wang²⁴ also included a large retrospective cohort to identify the number of cases diagnosed with an aberrant vessel based on antegrade pyelographic appearances to diagnose aberrant vessel as the cause with great accuracy²⁴.

In our study we included those patients who have differential renal function more than 30ml/min on the affected site. In the published studies poor renal function was also reported with lower success rate²³. Kapoor and colleagues²⁵ performed 34 endopyelotomies on poorly functioning kidneys and documented contradicting evidence in favour of a pyeloplast rather than PAE with GFR (5-15 mL/ min). Profoundly decreased renal function on the DTPA scan is associated with lesser success rates²⁶.

Endopyelotomy has not good results when the renal pelvis is large or ureter is high inserted. We also excluded patients with severe hydronephrosis because the degree of hydronephrosis has impact on the success rates of endopyelotomy. After establishing consensus with radiology department severe hydronephrosis on

ultrasound was defined as the loss of cortex with dilated pelvicalyceal system. Endopyelotomy is successful in selected patient who have good renal functions, no crossing vessels, mild to moderate hydronephrosis and dependent ureters^{26,27}.

CONCLUSION

Percutaneous antegrade endopyelotomy significantly reduced hospital stay, shorter operative time and early postoperative recovery with better cosmetic result. It is successful in selected patient who have good renal functions, no crossing vessels, mild to moderate hydronephrosis and dependent ureters.

REFERENCES

1. Rukin NJ, Ashdown DA, Patel P, Liu S. The role of percutaneous endopyelotomy for ureteropelvic junction obstruction. *Ann R Coll Surg Engl* 2007; 89:153-6.
2. Baldwin DD, Dunbar JA, Wells N, McDougall EM. Single-center comparison of laparoscopic pyeloplasty, Acucise endopyelotomy and open pyeloplasty. *J Endourol* 2003; 17:155-60.
3. Parkin J, Evans S, Kumar PV, Timoney AG, Keeley FX Jr. Endoluminal ultrasonography before retrograde endopyelotomy: can the results match laparoscopic pyeloplasty? *Br J Urol Int* 2003; 91: 389-91.
4. Poulakis V, Witzsch U, Schultheiss D, Rathert P, Becht E. [History of ureteropelvic junction obstruction repair (pyeloplasty). From Trendelenburg (1886) to the present]. *Urologe A* 2004; 43:1544-59.
5. Elabd SA, Elbahnasy AM, Farahat YA, Soliman MG, Taha MR, Elgarabawy MA, et al. Minimally-invasive correction of ureteropelvic junction obstruction: do retrograde endo-incision techniques still have a role in the era of laparoscopic pyeloplasty? *Ther Adv Urol* 2010; 1:227-34
6. Gogus C, Karamursel T, Tokatli Z, Yaman O, Ozdiler E, Gogus O. Long-term results of Anderson-Hynes pyeloplasty in 180 adults in the era of Endourologic procedures. *Urol Int* 2004; 73:11-4.
7. El-Nahas AR, Shoma AM, Eraky I, El-Kenawy MR, El-Kapany H. Prospective, randomized comparison of ureteroscopic endopyelotomy using holmium: YAG laser and balloon catheter. *J Urol* 2006; 175:614-8.
8. Fallon E, Ercole B, Lee C, Best S, Skenazy J, Monga M. Contemporary management of ureteropelvic junction obstruction: practice patterns in Minnesota. *J Endourol* 2005; 19:41-4.
9. Ramsay JW, Miller RA, Kellett MJ, Blackford HN, Wickham JE, Whitfield HN. Percutaneous pyelolysis: Indications, complications and results. *Br J Urol* 1984; 56:586-8.
10. Badlani G, Eshghi M, Smith AD. Percutaneous surgery

- for ureteropelvic junction obstruction (endopyelotomy): Technique and early results. *J Urol* 1986; 135:26.
11. Bernardo NO, Smith AD. Percutaneous endopyelotomy. *Urology* 2000; 56:322-7
 12. Stroom SB. Percutaneous endopyelotomy. *Urol Clin North Am* 2000; 27:685-93.
 13. Lojanapiwat B, Lertsupphakul B. Percutaneous endopyelotomy in the treatment of ureteropelvic junction obstruction. *J Med Assoc Thai* 2004; 87:947-50.
 14. Sim HG, Tan YH, Wong M. Contemporary results of endopyelotomy for ureteropelvic junction obstruction. *Ann Acad Med Singapore* 2005; 34: 179-83.
 15. Kumar R, Kapoor R, Mandhani A, Kumar A, Ahlawat R. Optimum duration of splinting after endopyelotomy. *J Endourol* 1999; 13: 89-92.
 16. Ost MC, Kaye JD, Guttman MJ, Lee BR, Smith AD. Laparoscopic pyeloplasty versus antegrade endopyelotomy: comparison in 100 patients and a new algorithm for the minimally invasive treatment of ureteropelvic junction obstruction. *Urology* 2005; 66:47-51.
 17. Rabah D, Soderdahl DW, McAdams PD. Ureteropelvic junction obstruction: does CT angiography allow better selection of therapeutic modalities and better patient outcome? *J Endourol* 2004; 18:427-30.
 18. Sundaram CP, Grubb RL 3rd, Rehman J, Yan Y, Chen C, Landman J, et al. Laparoscopic pyeloplasty for secondary ureteropelvic junction obstruction. *J Urol* 2003; 169:2037-40.
 19. Knudsen BE, Cook AJ, Watterson JD, Beiko DT, Nott L, Razvi H, et al. Percutaneous antegrade endopyelotomy: long-term results from one institution Original Research Article. *Urology* 2004; 63:230-4.
 20. Singh P, Kapoor R, Suri A, Singh KJ, Mandhani A, Dubey D, et al. Comparison of endopyelotomy and laparoscopic pyeloplasty for poorly functioning kidneys with ureteropelvic junction obstruction. *Ind J Urol* 2007; 23: 9-12.
 21. Savage SJ, Stroom SB. Simplified approach to percutaneous endopyelotomy. *Urology* 2000; 56:848-50.
 22. Van Cangh PJ, Wilmart JF, Opsomer RJ, Abi-Aad A, Wese FX, Lorge F. Long-term results and late recurrence after endoureteropyelotomy: A critical analysis of prognostic factors. *J Urol* 1994; 151:934-7.
 23. Gupta M, Tuncay OL, Smith AD. Open surgical exploration after failed endopyelotomy: A 12-year perspective. *J Urol* 1997; 157:1613-8.
 24. Wang W, LeRoy AJ, McKusick MA, Segura JW, Patterson DE. Detection of Crossing Vessels as the Cause of Ureteropelvic Junction Obstruction: The Role of Antegrade Pyelography Prior To Endopyelotomy. *J Vasc Interv Radiol* 2004; 15:1435-41.
 25. Kapoor R, Zaman W, Kumar A, Srivastava A. Endopyelotomy in poorly functioning kidney: is it worthwhile? *J Endourol* 2001; 15:725-8.
 26. Samarasekera D, Chew BH. Endopyelotomy still has an important role in the management of ureteropelvic junction obstruction. *Can Urol Assoc J* 2011; 5:134-6.
 27. Sim HG, Tan YH, Wong M. Contemporary results of endopyelotomy for ureteropelvic junction obstruction. *Ann Acad Med Singapore* 2005; 34:179-83.