

ORIGINAL RESEARCH

Open Pyeloplasty Surgical Techniques: Success Rate and Complications

Muftah M. EL-Garba^{1*}, Jalal A. Boderraha²

¹ Urology Department, Derna University, Derna, Libya

² El-Hawary Urological Centre, Benghazi Libya

Corresponding Author*: Dr. Muftah Elgarba, Urology Department, Derna University, Derna, Libya. E.mail: elgarba_uro@yahoo.com.

Received: 15 April 2023

Accepted: 20 May 2023

Published: 20 June 2023

ABSTRACT: Analytic study for patient's characteristics and open surgical techniques for patients diagnosed with PUJO in Benghazi, single center experience. A retrospective study of Forty-eight patients admitted to Al Hawari Urological Center in Benghazi diagnosed with UPJO during period of 36 months start from 1. 1. 2019 to 31. 12. 2021. 48 out of 132 with hydronephrosis cases [36.3%] were diagnosed as UPJO indicating that the UPJ obstruction constitutes the most common cause of hydronephrosis in our center. Clinical data regarding age, sex, complaint, laboratory investigations and KUB imaging studies, types of UPJO, side of UPJO, types of operations and post-operative complications were analyzed and evaluated in our series. There were two common types of open operations which were Anderson-Hynes pyeloplasty [38 cases] and Y-V folly's pyeloplasty [8 cases], the patients were discharged on 5th - 7th day post operatively. 58% of cases were adults, both gender were affected equally and the most common presentation war loin pain



[56.2%] followed by UTI [18.7%] and accidental [12.5%]. The age ranged between 2 months -70 years. The condition was most common in left side 25 cases [52.08%], and 20 cases [41.6%] on the right and bilateral affection in 6.2. Success and failure rate of both procedures [94% - 75% respectively] and the post-operative complications (fever, hematuria and urinary leak and their conservative management were reviewed). 38 cases subjected to Anderson Hynes pyeloplasty [79.1%], the successful rate was 36 cases [94.7%] and failed in 2 cases 5.3%. Folly's repair was done in other patients with excluding 2 cases who missing the follow up. The successful rate was 6 cases [75%]. UPJO was not uncommon in our society. Open pyeloplasty still giving good results and good success rate and rare possibility of post operative minor complications. So, these practices should be encouraged. It is recommended that to early diagnose of congenital urogenital system anomalies particularly UPJO antenatally is required to avoid complications.

KEYWORDS: Uretero-Pelvic Junction Obstruction (UPJO), Anderson-Hynes Pyeloplasty, Folly's Y-V pyeloplasty, Antenatal USG.

INTRODUCTION

The successful management of the obstructed PUJ continues to challenge the urologist, since 100 years after the first PUJ reconstruction was described by Trendelenburg⁽¹⁾. Of the many surgical options available, the dismembered Anderson-Hynes pyeloplasty is probably the most widely practiced, with the Folly's Y-V and flap procedures performed in selected cases. Although excellent results, with success rates of >90% are accepted for these open techniques⁽²⁻⁵⁾. The advent of various endourological techniques has produced many reports suggesting that open pyeloplasty may no longer be the treatment of choice^(6,7). This study was undertaken to document our experience with open pyeloplasty; the primary aims were to determine the overall success rate, complications and morbidity from open pyeloplasty in a department where most operations are performed by urological senior staff. The data gathered were also analysed to

audit our present practices in diagnosis and surgical techniques, and thus to determine whether any of these required modification in the context of current urological practice. The diagnosis of UPJO implies functionally significant impairment of urinary transport from the renal pelvis to the ureter. Although most cases are probably congenital in origin, the problem may become clinically apparent until much later in life⁽⁸⁾. Acquired conditions as inflammatory stricture, oesophageal folds, ureteral neoplasm may also present clinically with symptoms and signs of obstruction at level of the UPJ⁽⁹⁾.

This study was focused on congenital UPJO, presentations, clinical data, type of surgery and complication. The typical presentation has changed since the widespread use of antenatal ultrasound. The most common presentation was loin pain which was reported in 50%; UTI was the second followed by hematuria, abdominal masses and others⁽¹⁰⁾. The UPJO incidence before the era of antenatal USG was 1 in 5000, recently estimated incidence is 1 in 1500 live birth⁽¹¹⁾. The UPJO is by far the most common cause of hydronephrosis in children, so the

management of UPJO remain very important⁽¹²⁾. There are 2 types of UPJO; either intrinsic in which the obstruction is secondary to muscular discontinuity and smooth muscle disorientation at UPJ is evidence by electron microscope and real narrowing at UPJ is concealed as the catheterization of upper ureter can pass to renal pelvis without resistance, and Extrinsic type secondary to bands, kinks, and aberrant vessels also are commonly encountered⁽¹³⁾. In 1936, Folly described the result of 20 pyeloplasties using Y-V repair⁽¹⁴⁾. In 1946, Anderson and Hynes published their experience with an operation that included the complete transaction of upper ureter, subsequent spatulation and trimming of redundant renal pelvis⁽¹⁵⁾.

MATERIALS AND METHODS

This is a retrospective analysis at EL Hawari Urological Center in Benghazi, patients who had been managed for UPJO, during 36 months starting from 1. 1. 2019 to 31. 12. 2021, along with cases of hydronephrosis admitted during this period and their causes to find the percentage of UPJO out of hydronephrotic cases. The diagnosis of UPJO done by clinical data, ultrasound study, intra venous urography [IVU] and confirmed intraoperatively. 38 patients of 48 pyeloplasties underwent Anderson Hynes procedure and 8 cases by Foly's Y-V method. Polycolic acid, polyglactin or chromic catgut "3\0 or 4\0" sutures were used for the pyeloplasties and the ureter either splinted internally use JJ stent in 20 cases or using nephrostomy tube with pig tail stent in remaining cases to be removed endoscopically after 4 weeks, nephrostomy tube clamped for 8-12 hours to assess patency of UPJ by observation of flank pain and fever or through radiographic imaging "nephrostogram". External drainage from site of repair by using tube drain through separated stab incision removed after 2-3 day in case of stent or after removal nephrostomy by 7-10 days. In our series no patients underwent pyeloplasty

without stenting. Although the techniques of both procedures is simple and versatile, all surgical procedures done by senior staff in our department. Diagnosis and follow up of patients depend on our available diagnostic modality in our department namely IVU, USG, and we consider symptomology pre and postoperatively (follow up period 6-12 months).

RESULTS AND DISCUSSION

The various clinical presentations are summarized in table 1 while table 2 summarizes causes and percentages of hydronephrosis [HDN] included in this study out of which 48 patients were diagnosed as UPJO. The left side was affected in 25 patients while the right side affected in 20 patients, Bilateral the remaining 3 patients. Male and female is equally affected in our series, Renal function tests are normal in all patients, Primary UPJO in 37 patients and secondary UPJO present in 11 patients, Urinary infectivity documented in 11 patients and antibiotic therapy received by all patients, suppressive chemotherapy given only for infected urine postoperatively 3 of them having asymptomatic bacterurea, 2 patients have small renal pelvic stone which was removed during pyeloplasties and these patients remained stone-free during follow up. In cases operated by Anderson Hynes pyeloplasty, the Complications postoperatively were mild, 2 patients complicated by hematuria and one patient post operative fever another patient develop urinary leak treated by percutaneous tube drain and other complications treated conservatively. In cases of Foly's Y-V pyeloplasty the complication also mild in form of hematuria in 3 cases and 2 cases fever, one case of urinary leak and was treated by conservative measures (Table 3). 36 cases were successful "94%" in Anderson Hynes pyeloplasty and only 2 cases underwent nephrectomy for poor functioning affected kidney or due to continuing pain, while 6 cases

out of 8 "75%" in Foly's Y-V pyeloplasty (Table 4) only 2 patients "25%" were given unsatisfactory outcome because persist obstruction and continuation of pain, one of them underwent nephrectomy and other underwent repeated pyeloplasty.

Table 1: Percentage of Presentations.

Presentation	No	%
Loin pain	27	56.2
Recurrent UTI	9	18.7
Accidental	6	12.5
Abd.mass	3	6.2
Heamaturia	3	6.2

Table 2: Causes and Percentage of Hydronephrosis.

HDN	CAUSES	%
48	UPJ obstruction	36.3%
39	Renal stone	29.3%
9	V.U.R	6.8%
6	Ureteric stricture	4.5%
5	Post.urethral.valve	3.7%
4	Obstructive megaureter	3%
4	B.P.H	3%
3	U.T.I	2.2%
3	unknown cause	2.2%
2	Renal cyst	1.5%
2	Ca cervix	1.5%
2	Retroperitoneal fibrosis	1.5%
1	Retroperitoneal mass	0.75%
1	Prune belly syndrome	0.75%
1	Ca colon	0.75%
1	Ureteric injury	0.75%
1	Non Hodgkin lymphoma	0.75%
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Table 3: Post-Operative Complications.

Post-operative cx	A.H	V.Y	Management
Fever	1	2	conservative
Heamaturia	3	4	conservative
Urinary leak > 5 days	2	3	percutaneous drainage

With rapid developments in endourology, there is a trend towards less invasive procedures and the role of pyeloplasty is being redefined. however the success rate claimed for endopyeotomy is about 75%^(6,7,9), whereas that for pyeloplasty is about 95%⁽²⁻⁵⁾. In the present series, the success rate after a single repair was in Anderson Hynes pyeloplasty and Foly's Y-V pyeloplasty 94%, 75% respectively.

Table 4: Success and Failure Rates of the Two Different Procedures.

Operation	Result	Total (%)
Anderson Hynes Pyeloplasty	Successful	36(94%)
	Failure	2(6%)
Foly's Y-V Pyeloplasty	Successful	6(75%)
	Failure	2(25%)

Of the four kidneys that deteriorated, only three kidneys were removed to alleviate intractable pain. Renal function remains stable in normal limit and success rate judged by symptomatic improvement was 98%. The role of nephrostogram is important to delineate post operative obstruction as our department not well equipped [we have not renal scintigraphy] although there is equivocal results as postoperative obstruction secondary to mucosal oedema or clot retention at anastomotic site.

The role of routine pre-operative retrograde pyelography has been questioned often; the need to delineate the exact anatomy of UPJO and occasional detection of megaureter have been cited as compelling reason for performing retrograd pyelography⁽¹⁶⁾.

The identification of pre-operative predictors of outcome is important, the influence of age and status of urinary infectivity and presence of palpable kidney masses need further evaluation with big material number and sophisticated diagnostic modalities to conduct effective correlation.

Apart from the beneficial effect on the kidney ,early pyeloplasty in children has been reported to improve somatic growth⁽¹⁷⁾.

In this study the symptoms and signs were mainly discovered postnatal. Children and adults diagnosed with UPJO were found to account up to 36.3% of all hydronephrotic cases.

However, the current widespread use of maternal USG has led to dramatic increase in the number of asymptomatic newborns being diagnosed with hydronephrosis, many of whom are subsequently found to have UPJO^(6,7). In addition, it was detected that the most common presentation is loin pain and recurrent UTI which is supported in other literatures .Also sex was equally affected in our series while, in most literatures, males were more affected.

In our series the adult was more commonly affected than children and

this is against almost other series which may reflect less commonly uses of maternal USG. Left sided affected more than the right one as in most literatures. Bilateral affection in about 6.2 %. Primary UPJ obstruction was about 77.08% while secondary UPJ obstruction was 22.9%. Post operative complications were rare and of mild severity [fever, heamaturia, urinary leak] and treatment were conservative or by percutaneous tube drain in both procedures. Success rate of Anderson Hynes pyeloplasty was better than Foly's Y-V repair 94%,75% respectively. Endo-urolological methods like direct endoscopic incision, balloon dilatation are published nowadays but it's a preferable in cases of recurrence or in post-operative obstruction, but the endopyelotomy must be done laterally to avoid bleeding and the procedure may preclude minimally invasive angiography prior to endopylotomy⁽¹⁸⁾.

Desai MM et al established access to hydronephrotic kidney performing first percutaneous pyeloplasty, the concept was

attractive and technology was available⁽¹⁹⁾. Laproscopic pyeloplasty has been attempted. Four canula are needed with longer operating time and added surgical difficulty⁽²⁰⁾.

CONCLUSION

UPJ obstruction was one of the most common diseases presented in EL Hawari Urological Center in Benghazi, So, maternal ultrasound screening should be concerned for early diagnosis of UPJO antenatal to avoid complications as early as possible. In spite of great advances and techniques regarding management of UPJO such as endopyelotomy and laparoscopic pyeloplasty, open surgery like Andrson Hyenes and Folly's Y-V still gold standard with high success rate which proved by many comparative studies worldwide.

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المخلص

دراسة تحليلية لخصائص المرضى وتقنيات الجراحة المفتوحة لمرضى انسداد الحالب والحوض الكلوي في بنغازي، تجربة مركز واحد. دراسة استرجاعية شملت 48 مريضًا تم إدخالهم إلى مركز الهوارى لجراحة المسالك البولية في بنغازي، والذين تم تشخيص إصابتهم بانسداد الحالب والحوض الكلوي خلال فترة 36 شهرًا، من 1 يناير 2019 إلى 31 ديسمبر 2021. تم تشخيص 48 حالة من أصل 132 حالة استسقاء كلوي (36.3%) بانسداد الحالب والحوض الكلوي، مما يشير إلى أن هذا الانسداد هو السبب الأكثر شيوعًا للاستسقاء الكلوي في مركزنا. تم تحليل وتقييم البيانات السريرية المتعلقة بالعمر، والجنس، والشكوى، والفحوصات المخبرية، ودراسات التصوير الشعاعي للبطن والحوض، وأنواع انسداد الحالب والحوض الكلوي، وجانب الانسداد، وأنواع العمليات الجراحية، والمضاعفات بعد الجراحة في هذه الدراسة. كان هناك نوعان شائعان من العمليات الجراحية المفتوحة، وهما رأب الحويضة بطريقة أندرسون-هاينز (38 حالة) ورأب الحويضة بطريقة (8 Y-V حالات). غادر المرضى المستشفى في اليوم الخامس إلى السابع بعد العملية. 58% من الحالات كانت لبالغين، وتأثر كلا الجنسين بالتساوي، وكان العرض الأكثر شيوعًا هو ألم الخصرة (56.2%)، يليه التهاب المسالك البولية (18.7%)، ثم التبول العرضي (12.5%). تراوحت أعمار المرضى بين شهرين و70 عامًا. كانت الحالة أكثر شيوعًا في الجانب الأيسر (25 حالة [52.08%])، وفي الجانب الأيمن (20 حالة [41.6%])، مع إصابة كلا الجانبين (6.2%). تمت مراجعة معدل نجاح وقشل كلا الإجراءين (94% و75% على التوالي)، والمضاعفات بعد العملية (الحمى، وبيلة دموية، وسلس البول) وطرق علاجها التحفظية. خضع 38 مريضًا لعملية رأب الحويضة بطريقة أندرسون هاينز (79.1%)، وبلغت نسبة النجاح 36 حالة (94.7%)، بينما فشلت العملية في حالتين (5.3%). أُجري إصلاح فولّي في المرضى الآخرين، باستثناء حالتين لم يتابعهما الطبيب. وبلغت نسبة النجاح 6 حالات (75%). يُعد انسداد الوصلة الحالبية الحوضية (UPJO) شائعًا في مجتمعنا. لا تزال عملية رأب الحويضة المفتوحة تُحقق نتائج جيدة ونسبة نجاح عالية، مع احتمال ضئيل لحدوث مضاعفات طفيفة بعد العملية. لذا، ينبغي تشجيع هذه الممارسات. يُوصى بالتشخيص المبكر لتشوهات الجهاز البولي التناسلي الخلقية، وخاصة انسداد الوصلة الحالبية الحوضية، قبل الولادة لتجنب المضاعفات.

الكلمات المفتاحية: انسداد الوصلة الحالبية الحوضية (UPJO)، رأب الحويضة بطريقة أندرسون هاينز، رأب

