IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 19, Issue 9 Ser.7 (September. 2020), PP 38-40
www.iosrjournals.org

Comparative study: Anderson – Hynes versus Vertical flap Pyeloplasty.

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KEYWORDS:
Ureteropelvic junction
Ureteropelvic junction obstruction

Date of Submission: 05-09-2020 Date of Acceptance: 20-09-2020

I. Introduction

Ureteropelvic junction obstruction (UPJO) is defined as a functionally significant impairment of urine flow from the renal pelvis across the UPJ to the proximal urethra. Patients usually present with symptoms of flank pain, Diet's crisis, urinary tract infections, Hematuria, and sometimes nephrolithiasis[1] . Diagnosis may involve use of a number of anatomic imaging studies (ultrasonography, intravenous Pyelography, retrograde Pyelography, computed tomography-based urography, etc) and functional tests (diuretic radionuclide renography, rarely Whitaker test); Hydronephrosis in itself does not imply obstruction, and imaging with diuretic renography is important to confirm that obstruction is indeed present[2] . The first reconstructive procedure for ureteropelvic junction (UPJ) obstruction was performed by Trendelenburg in 1886. Foley modified flap techniques, first introduced by Schwyzer in 1923 after the application of the Durante pyloroplasty principle, successfully to Y-V pyeloplasty in 1937. Culp and de-Weerd introduced the spiral flap in 1951. Scardino and Prince reported about the vertical flap in mid 20th century[3] . Traditionally open pyeloplasty has been the standard of care but minimally invasive surgical techniques have become increasingly popular. Endopyelotomy has a lower success rate than other modalities (42–90% depending on the approach), but is associated with reduced pain and shorter convalescence. Laparoscopic pyeloplasty and robot-assisted pyeloplasty have similar success rates to open pyeloplasty (>90%), with the additional advantages of significantly reduced morbidity and shorter convalescence.

II. Aims and Objectives

A comparative study of dismembered and vertical flap pyeloplasty is done with following aims and objectives

- To assess advantages and disadvantages of both the techniques .
- Limitations of dismembered and vertical flap pyeloplasty .

III. Material & Methods

The study was conducted in department of Urology , PGIMS Rohtak between August 2014 to July 2017 . Total of 22 patients were operated by single surgeon , out of which 10 were Anderson – Hynes pyeloplasty and 12 were vertical flap pyeloplasty . All but one patients underwent open extraperitoneal pyeloplasty . Decision to choose type of pyeloplasty was taken depending upon crossing vessel , intraoperative findings & redo case . Data was analysed and all patients were followed up till 3 months .

Inclusion Criteria : All patients having UPJO , including secondary renal stone
Exclusion Criteria : Patients of B/L UPJO , who require nephrectomy and UPJO with VUR .

IV. Observations

From August 2014 to July 2017 , 22 patients having symptomatic UPJO were operated in department of Urology , PGIMS Rohtak . Out of these , 1 patient underwent laparoscopic transperitoneal pyeloplasty while rest of 21 patients underwent open , retroperitoneal approach pyeloplasty. 10 patients were male while 12 were female patients . 10 patients underwent Anderson-Hynes pyeloplasty while 12 patients underwent vertical flap of Prince & Scardino pyeloplasty . In 1 patient laparoscopic was converted to open pyeloplasty due to difficulty in intracorporeal suturing technique .

Mean operative time for AH pyeloplasty was 70 minutes while it was 40 minutes for vertical flap pyeloplasty .

Minimum average blood loss in AH pyeloplasty was 60 ml (1 sponge) , while for vertical flap it was negligible .

2 patient who underwent vertical flap pyeloplasty were already had failed pyeloplasty sometimes back (AH pyeloplasty) .

In 1 patient of redo vertical flap pyeloplasty, there was need to place intraoperative nephrostomy tube

Out of 12 vertical flap pyeloplasty patients , all were successful pyeloplasties . While out of 10 AH pyeloplasty , 2 patients had failed pyeloplasty (1 open & 1 laparoscopic AH pyeloplasty) .

V. Results

1. Average time in doing vertical flap was less as compare to AH pyeloplasty . Time difference was 30 minutes . Cause for this time difference was that in vertical flap technique, we don't have to transect at level of UPJ . We only need to raise flap & start anastomosing .
2. Minimum average blood loss for vertical flap pyeloplasty was significantly less as compare to AH pyeloplasty , specially it matters to those females whose hemoglobin is on marginally lower side .
3. In already operated case of pyeloplasty i.e. failed pyeloplasty , redo pyeloplasty with vertical flap pyeloplasty is far more superior option than AH technique because there is no need to divide the already relatively hypovascular UPJ . Hence , results are better .
4. Placing intraoperative nephrostomy tube usually is not helpful until unless repair is precarious or stricture is of long segment .

VI. Discussion

Obstruction of UPJ is probably the most common congenital abnormality of the ureter [4,5] . Although the problem is congenital but may not become apparent until much later in life. In older children or adults, intermittent abdominal or flank pain, at times associated with nausea or vomiting, is a frequent presenting symptom. Repair of Ureteropelvic junction (UPJ) obstruction is traditionally done either by dismembered pyeloplasty or a non-dismembered flap pyeloplasty. Dismembered pyeloplasty requires the division and re-anastomosis of the ureter. This procedure has a very high success rate but is unsuitable for obstructions that involve long strictures. Conversely non-dismembered flap pyeloplasty requires the incision of the ureter along the length of the stenosis and creation of a broad flap from the renal pelvis, and subsequent anastomosis of this flap. While this procedure is more complex, it allows correction of relatively long ureteral narrowing. Once UPJ obstruction diagnosis has been made, pyeloplasty should be performed as soon as possible in order to preserve the renal functions in normal or moderately reduced functioning rental units [6,7] . Nowadays, Anderson Hynes Dismembered pyeloplasty and vertical flap pyeloplasty are commonly used technique by most urologists in UPJ obstruction . In our case , Anderson Hynes pyeloplasty was done in 10 patients while vertical flap pyeloplasty in 12 patients . The indications for placement of stents or nephrostomy tube intra operatively remain controversial and may be different in paediatric and adult practices. Most paediatric urologists avoid routine use of stents and nephrostomy tubes[8] . But in our study , in one patient of age 9y , we did not place stent/nephrostomy while doing AH pyeloplasty and in post-op period, there was significant urine leak in drain. It was subsequently controlled by post-op JJ stenting. In our 2 patients in which there was previously failed AH pyeloplasty , redo pyeloplasty using vertical flap was highly successful . Increased vascularity of the anastigmatic segment due to incomplete resection is very helpful for better outcome . Open dismembered pyeloplasty has withstood the test of time with its excellent results . Despite excellent results, widespread acceptance of the laparoscopic dismembered Anderson-Hynes pyeloplasty is hampered by its steep learning curve[9, 10, 11] . At present, most urologists in the surgical repair of UPJ obstruction prefer a dismembered pyeloplasty because this procedure is almost universally applicable to the different clinical scenarios except long and or multiple stricture segments. This approach can be used regardless of whether the ureteral insertion is high on the pelvis or already dependent. It also permits reduction of a redundant pelvis or straightening of a tortuous proximal ureter. Furthermore, anterior or posterior transposition of the UPJ can be achieved when the obstruction is due to accessory or aberrant lower pole vessels. In addition, unlike the flap techniques, only a dismembered pyeloplasty allows complete excision of the anatomically or functionally abnormal UPJ itself. All patients in our study had pre-op renal scan and after 3 months post-op . JJ stent was removed in post-op 6 weeks in all patients . None of the patients were lost in follow up and they continue to do well , except for 2 patients of failed AH pyeloplasty . One of them failed to undergo any kind of intervention , while other was lost to follow up .

VII. Conclusion

1. Though open dismembered pyeloplasty is gold standard treatment for UPJO , non dismembered pyeloplasty has advantage of better blood supply at site of anastomosis and ability to cover good length of stricture Hence can be applied to cases of previously failed pyeloplasty .
2. JJ stent should be kept for at least 6 weeks for optimal results in both types of pyeloplasty while in children , its role is still controvertial .
3. Post-op NT is not essential unless repair is precarious or stricture segment is long type.
4. Vertical flap pyeloplasty is now a day's emerging as easy to go , simpler, less time consuming , most favourable outcome with minimal blood loss Hence , we recommend use of such type of pyeloplasty in future so that more comparative results are drawn for near 100% success rate .

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