

**Comparative Study Between Anderson-Hynes Pyeloplasty Through
Transperitoneal Laparoscopic Approach Versus Pyeloplasty Through
Vertical Lumbotomy Approach In UPJO Repair**

**Thesis Submitted for Partial Fulfillment
Of the Requirement of Master Degree
in Urology**

By

**Yehia Raafat Yehia Hassan
Resident Urology MOHP**

Supervised by

Prof. Dr.

Abd El-Hamid Youssef

**Professor of Urology,
Faculty of Medicine
Ain Shams University**

Dr.

Ahmed Farouk

**Lecturer of Urology,
Faculty of Medicine
Ain Shams University**

**Faculty of Medicine
Ain Shams University**

2017

Table of Contents

List of tables	3
List of figures	4
List of abbreviations	6
Introduction	8
Aim of the work	10
Review of literature	12
Aetiology.....	13
Diagnosis.....	14
Treatment	24
Laparoscopic approach	31
Open approach.....	41
Patients and method	45
Discussion	80
Summary	85
References	90

List of tables

table	Content
1	Vertical Lumbotomy statistical data
2	Laparoscopic approach statistical data
3	Demographic comparison between vertical lumbotomy and Laparoscopic approach
4	Site details
5	Preoperative pain and renogram outcomes
6	Operative time
7	Post operative incidents comparison
8	Post operative pelvicalyceal improvement by IVP
9	Post operative T ½ in minutes
10	Post operative split renal function

List of figures

Figure	Content
1	UPJO due to a crossing vessel to the lower pole
2	Maximum intensity projection on UPJ
3	Diuretic renogram in normal and obstructed system
4	IVP showing PUJO
5	Crossing vessel in a 7-year-old girl with intermittent left flank pain.
6	Foley Y-V plasty
7	Spiral (Culp–DeWeerd) flap
8	Vertical (Scardino–Prince) flap
9	Anderson Hynes Technique
10	Transperitoneal laparoscopic pyeloplasty
11	Retroperitoneal laparoscopic pyeloplasty
12	Retroperitoneal laparoscopic pyeloplasty.
13	Lateral position for flank incision
14	vertical dorsal incision
15	vertical dorsal incision
16	Vertical Lumbotomy position
17	Landmark for vertical lumbotomy incision
18	Vertical Lumbotomy - Ureter and lower pole of the kidney
19	Vertical Lumbotomy - Renal pelvis and ureter after incision of the renal pelvis
20	Vertical Lumbotomy - Reduced renal pelvis
21	Vertical Lumbotomy - DJ fixation
22	Vertical Lumbotomy - Incision post operative
23	Laparoscopic Pyeloplasty trocars' placement
24	Laparoscopic Pyeloplasty ureter and lower pole of the kidney
25	Laparoscopic Pyeloplasty - Anterior abdominal wall stay
26	Laparoscopic Pyeloplasty - Guide wire fixation
27	Laparoscopic Pyeloplasty - DJ fixation
28	Laparoscopic Pyeloplasty - DJ in place
29	Laparoscopic Pyeloplasty - Anastomotic sutures

30	Gender comparison
31	Age comparison
32	Site comparison
33	T1/2 Comparison
34	Split renal function
35	Significant pain
36	Operative time comparison
37	Leakage incidence
38	Drain removal
39	Post operative pain
40	Amount of leakage
41	Duration of leakage
42	Catheter time
43	Hospital stay by days
44	IVP pelvicalyceal dilatation
45	T ½ in minutes
46	Split renal function %

List of Abbreviations

Abbreviation	Content
ALP	Alkaline phosphatase
ARFI	Acoustic radiation force impulse
BMI	Body Mass Index
CRVs	Crossing vessel
CT	Computed tomography
DR	Diuretic Renography
DTPA	Diethylenetriaminepentaacetate
ET-1	Endothelin-1
fMRI	Functional MRI
GFR	Glomerular Filtration Rate
GGT	Gamma glutamyl transferase
IVP	Intra Venous Pyelogram
LP	Laparoscopic Pyeloplasty
MAG3	Mercaptoacetyl triglycine
MBq	MegaBecquerel
MIP	Maximum Intensity Projection
MRA	Magnetic Resonance Angiography
MRI	Magnetic Resonance Imaging
MRU	Magnetic Resonance Urography
NAG	N acetyl Beta D glucosaminidase
NC-MRA	Non-contrast Magnetic Resonance Angiography
RP	Robotic Pyeloplasty
RTT	Renal Transit Time
TGF- β 1	Transforming growth factor- β 1
UPJO	Uretero Pelvic Junction Obstruction
UTI	Urinary Tract Infection
VACTERL	Costo-vertebral abnormalities – Anal atresia – Cardiac defects – Tracheo-esophageal abnormalities-Renal abnormalities- Limb abnormalities – Single umbilical artery
VUR	Vesico Ureteric Reflux

INTRODUCTION

Definition

Ureteropelvic junction obstruction (UPJO) is defined as impeded urine outflow from the renal pelvis to the ureter, which may result in progressive damage to the kidney (45).

Epidemiology

Obstructive nephropathy is the main cause of end stage renal disease in children (104).

With a varying incidence of approximately 1 per 1000-1500, (23). With a male to female ratio of 2:1 and can be detected at any time, ranging from intra-uterine period through pre-natal ultrasonography to old age. Two thirds of congenital cases affect the left kidney, with 10–46% occurring bilaterally (99).

AIM OF THE WORK

To compare the dismembered Anderson- Hynes pyeloplasty through transperitoneal laparoscopic approach to the vertical lumbotomy approach in treatment of Pelvi Ureteric Junction obstruction as regards operative and post operative details.

REVIEW OF LITERATURE

Aetiology

A favourable theory explaining the aetiology of UPJO is the functional obstruction theory which is due to abnormalities in the smooth muscles of the ureter (1). Also a physical obstruction of the ureter as in case of a crossing vessel can cause UPJO but the debate is if it can be the sole cause or there is also a functional element. There are multiple possible causes, which can be categorized to intrinsic and extrinsic factors. (2)

Intrinsic factors:

- Disruption of ureteric peristalsis through replacement of smooth muscles with collagen which results in smooth muscles disruption (3).
- Iatrogenic cause as scar formation following surgical manipulation of the ureter (4).
- Fibroepithelial polyp (5)
- Ureteric kinking (6).

Extrinsic factors:

- A crossing vessel to the lower pole, this happens in 40% of cases although there is a debate if there is an intrinsic functional factor coexists (7).

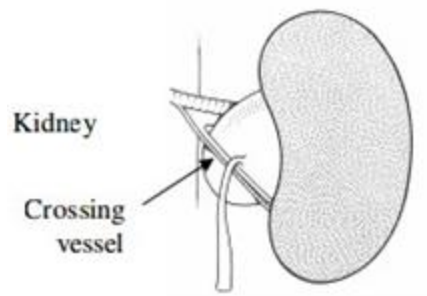


Figure (1) UPJO due to a crossing vessel to the lower pole (7)

- Vesico Ureteric Reflux coexists in 8-14% of cases (8).

Diagnosis:

Clinical presentation:

Prenatal period: Nowadays most of cases are discovered with routine ultrasonography follow-up during pregnancy (9).

Presenting symptoms maybe loin colicky pain related to fluid intake and diuretics (10) and hematuria (11).

Signs include UTI, hematuria and hypertension (11).

UPJO may be associated with VACTERL syndrome which stands for (Costo-vertebral abnormalities – Anal atresia – Cardiac defects – Tracheo-esophageal abnormalities-Renal abnormalities- Limb abnormalities – Single umbilical artery) and the most common renal abnormality is VUR which is a potential cause for UPJO (12).

Investigations:

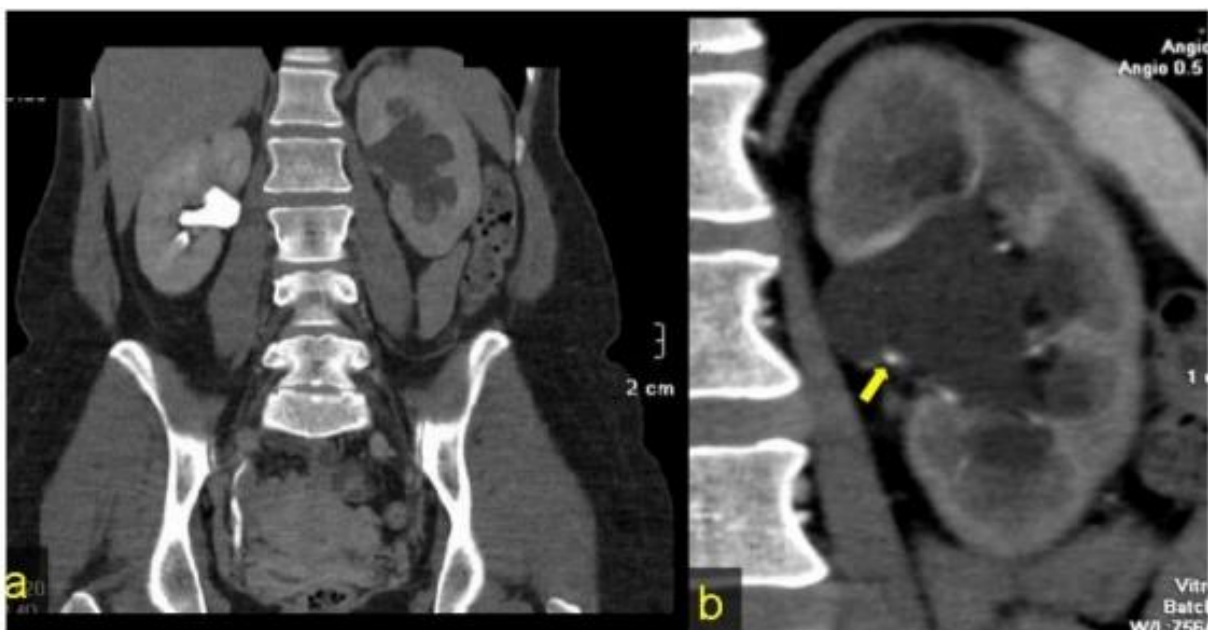
Imaging

Renal ultrasound: Recently Kelley and his colleagues noted objective and quantifiable sonographic renal parenchymal measurements in children with unilateral UPJO. These sonographic renal parenchymal measurements correlate closely with worsening of Hydronephrosis (13).

Acoustic radiation force impulse (ARFI) which is a type of U/S elastography is considered as a non invasive, radiation-free procedure for evaluating parenchymal stiffness may prove useful in the diagnostic work-up and follow-up of children with UPJO-induced renal disease (14).

Computerized Tomography

Computed tomography (CT) with two and three dimensional post processing allow a comprehensive, single-study assessment of the uretero-vascular relationships in UPJO (15).



Ureteropelvic junction stenosis, coronal maximum intensity projections (a, b) show left ureteropelvic junction stenosis, close to crossing vessels of uncertain involvement (arrow), pyelocalycial dilatation and decreased cortical nephrogram are seen

Figure (2) (16)

CT angiography permits an adequate preoperative assessment of patients with UPJ obstruction as it is able to identify the presence and location of crossing vessels. Furthermore, it allows studying in detail the anatomy of the renal area and its vascular variants (14).