Comparative study between nephrectomy through trans-peritoneal laparoscopic approach versus dorsal lumbotomy open approach for treatment of symptomatizing small atrophic kidney

Thesis

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By

Mohammed Abdelgawad Omer

Resident of urology

El- Sahel teaching hospital

M.B.B.CH

Under supervision of

Prof. Dr. ABD EL-HAMEED ABDELKADER YOUSSEF

Professor of urology

Faculty of medicine, Ain shams university

Dr. Ahmed Farouk Mahmoud

Lecturer of urology

Faculty of medicine, Ain shams university

Faculty of medicine

Ain shams university

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طبيب / محمد عبدالجواد عمر

مستشفي الساحل التعليمي

بكالوريوس طب وجراحة

تحت اشراف

الاستاذ الدكتور/ عبدالحميد عبدالقادر يوسف

استاذ جراحة المسال البولية

بكلية الطب جامعة عين شمس

الدكتور/ احمد فاروق محمود

مدرس جراحة المسالك البولية

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List of contents

List of figures

List of diagrams

Introduction

In 1929, Erik Ask-Upmark, a Swedish physician, described small distinctive kidneys in eight patients, seven of whom had malignant hypertension; six of these patients were adolescents. Subsequently, this problem was described histologically as focal renal hypoplasia resulting in segmental renal scar. In Segmental renal hypoplasia or Ask-Upmark the patients (usually females and young women) most frequently present with hypertension [1].

Ask-Upmark kidney has been shown to be 12 to 35 gm [4].

Abnormal renin secretion has proposed to be the cause of hypertension, however, nephrectomy has been shown to normalize blood pressure regardless of plasma renin activity in patients with unilateral disease, partial or total nephrectomy may control hypertension [4].

Laparoscopic nephrectomy in a porcine animal was first attempted via a retroperitoneal approach by Weinberg and smith in 1988. In 1991, after extensive laboratory trial including the development of basic concepts of organ entrapment and tissue morcellation, Clayman and coworkers performed the first clinical laparoscopic nephrectomy [3].

Since first performed by Clayman, laparoscopic nephrectomy has proved to have various advantages, these advantages include decreased post-operative pain medication requirement, shorter hospital stay, quicker

convalescence time, and potentially lower complication rates [5].

Laparoscopic nephrectomy is indicated in the management of benign renal disease associated with significant loss of function or that contributes to patient morbidity. This includes chronic pyelonephritis, obstructive nephropathy, renovascular hypertension, cystic disease (congenital or acquired), non-functioning due to stone disease, and reflux nephropathy [3].

The dorsal lumbotomy is useful for simple nephrectomy for small atrophic kidney, simultaneous bilateral simple nephrectomies, renal biopsies, pyeloplasty, pyelolithotomy, upper ureterolithotomy, and other procedures on the renal pelvis or upper ureter [2].

The dorsal lumbotomy incision offers relatively atraumatic access to the ureteropelvic junction especially in properly selected thin patients [2].

Because the muscles are retracted rather than transected, patients benefits from less pain and strong closure [1].

Post-operative flank bulges are less common than with the flank approaches. Rib resection is not necessary because the exposure is adequate with division of the costovertebral ligament and rib retraction [1].

Aim of the study

To compare between nephrectomy through trans-peritoneal laparoscopic approach versus dorsal lumbotomy open approach as a treatment for symptomatizing small atrophic kidney, as regards operative and postoperative outcomes.

REVIEW OF LITERATURE

CHAPTER 1

INCIDENCE AND ETIOLOGY OF A SMALL ATROPHIC KIDNEY

Small atrophic kidney

Hypoplasia is defined as underdevelopment of a tissue or organ, and is usually due to a deficiency in the number of cells. Renal hypoplasia is a condition in which there is a reduction in the size of functioning renal mass. Use of the term renal hypoplasia should be restricted to kidneys that have less than the normal number of calyces and nephrons [(1)].

A small atrophic kidney can be seen in the following conditions:

A) Hypo-plastic kidney as in congenital conditions, Ask-Upmark kidneys, Oligomeganephronia, renal hypo dysplasia [(1)].

B) Atrophic end stage kidney as seen in end stage and chronic renal diseases as:

- As a sequalae of atherosclerotic diseases [(1)].
- As a complication of inflammatory kidney diseases, as in pyelonephritic renal atrophy [(27)].
- Other conditions, in which small shrunken kidney can be seen include, Peri-medial fibroplasia [(1&9)], on top of renal artery stenosis [(1)].
- Post renal surgeries atrophic kidneys.

- **Figure 1** Gross appearance of an atrophic kidney with mediolateral section showing hypoplastic areas [22].

Symptomatizing small atrophic kidney

Clinical manifestations associated with a small shrunken (atrophic) kidney, may be the leading cause or the result of the original renal pathology;

(A) Reno-vascular hypertension

In segmental renal hypoplasia (Ask-Upmark kidney), patients (usually women and girls) frequently present with severe hypertension. The disease is associated with severe hypertension, sometimes with headaches, either alone or together with hypertensive encephalopathy, and with retinopathy in half of the patients [1].

Abnormal renin secretion has proposed to be the cause of hypertension in such cases, however nephrectomy has been shown to normalize blood pressure regardless of plasma renin activities [1&9&10].

(B) Infection

Many individuals with chronic pyelonephritis have no symptoms, but they may have a history of frequent UTIs. In children there is a strong correlations between renal scarring and recurrent UTIs [11].

Atrophic pyelonephritis results from chronic infection that may be ascending from the lower urinary tract or hematogenous in origin. Sometimes it follow surgical intervention on the kidney such as nephrolithotomy or plastic repair [11].

The diminutive kidney resulting from atrophic pyelonephritis may be bilateral or unilateral. When bilateral it can result in uremia or death, and if unilateral it can be cured with nephrectomy. It can take place in a congenitally hypoplastic kidney, but it usually occurs in kidneys that are of normal size at birth [11].