Post-Operative Lumbar Hernia and Bulge Following Surgical Flank approach(es) to the Kidney; A Study of Related Factors

Thesis

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بسم الله الرحمن الرحيم

قالوا سبحانك لاعلم لنا إلا ماعلمتنا إنك أنت العليم الحكيم

صدق الله العظيم

سورة البقرة آية ٣٢

DEDICATION

I WISH TO DEDICATE THIS WORK TO MY FATHER AND MY WIFE

I'M HERE NOW BECAUSE OF YOU, YOU ARE ALL MY REASONS

Acknowledgement

First of All Thanks To **ALLAH**

I would like to express my profound gratitude to **Professor Tarek Osman** Professor of Urology, Faculty of Medicine, Ain Shams University for his most valuable advice and support throughout the whole work and for dedicating much of his precious time to accomplish this work.

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Introduction

Hernia is defined as protrusion of a viscus through an opening in the wall of the cavity in which it is contained. The size of a hernia is determined by the dimension of the neck and the volume of the distended sac. Hernia occurs where aponeurosis and fascia are devoid of support of striated muscle. Most common sites are groin, umbilicus, Linea Alba, semilunar line of Spiegel, diaphragm and surgical incision ***(Schumpelick and Treutner, 2001***).

Hernias may or may not present with either pain at the site, a visible or palpable lump, or in some cases more vague symptoms resulting from pressure on an organ which has become "stuck" in the hernia, sometimes leading to organ dysfunction. Fatty tissue usually enters a hernia first, but it may be followed or accompanied by an organ ***(Mizrahi H, et al., 2012)***.

The lumbar region is an area bounded superiorly by the 12th rib, inferiorly by the iliac crest, medially by the erector spinae muscles, and laterally by the external oblique muscle. The region is divided into the superior lumbar triangle and an inferior lumbar triangle ***(Alfisher et al., 1995)***.

The description of the anatomical limits of the inferior lumbar space was made by Petit in 1783 ***(Petit, 1783)*** and a description of the superior space was made by Grynfeltt in 1866 ***(Grynfeltt, 1866)***. The superior lumbar triangle (Gryn-feltt's Triangle) is defined medially by the erector spinae muscle group, laterally by the internal oblique muscle, and superiorly by the 12th rib. The floor of this triangle is formed by aponeurosis of the transversalis muscle, and the roof is formed by the latissimus dorsi muscle ***(Cesar et al., 2012)***.

Three areas of weakness can be found in this space: immediately below the rib where the transversalis fascia is not covered by the external oblique muscle, in the area of fascial penetration of the 12th

dorsal intercostal neurovascular pedicle, and between the inferior edge of the rib and the ligament of Henle. The predisposition to herniation in this space is extremely variable and depends on the following: size and form of the triangle; length and angulation of the rib; size and form of the quadratus lumborum and serratus posterior muscles; insertion of the latissimus dorsi between the 11^{th} and 12^{th} ribs; union of the posterior fibers of the latissimus dorsi and external oblique; variable insertion of the fibers of the external oblique above the 12^{th} rib; and whether the internal oblique muscle is muscular or aponeurotic at its insertion above the 12^{th} rib (a tall, thin person with angulated final ribs will have a smaller superior lumbar space than a short, obese person with horizontal ribs ***(Cesar et al., 2012)***.

The inferior lumbar triangle (Petit's Triangle) is defined by the iliac crest inferiorly, the external oblique muscle laterally, and the erector spinae muscle group medially. The floor of this space consists of aponeurosis of the transversalis muscle, internal oblique muscle, and lumbodorsal fascia, with the roof being formed by superficial lumbodorsal fascia ***(Petit, 1783)***.

Thinning of the muscles or defects in the lumbodorsal fascia and transversalis aponeurosis creates areas of weakness that permit herniation of retroperitoneal fat and abdominal viscera. Occasionally the edges of the latissimus dorsi and external oblique muscles may be adjoining and close the space ***(Egea et al., 2007).*** Predisposing factors to herniation in this space may be alterations in the origin of the external oblique muscle and a more medial latissimus dorsi giving rise to a larger triangle base (common in women with wide hips), tapering of the internal oblique muscle or its not being completely tendinous, and the presence of the Hartmann fissure at the vertex of the triangle. Unlike the superior space, the inferior space is not penetrated by nerves or blood vessels that weaken the floor ***(Cesar et al., 2012)***.

Lumbar hernias occur in the flank and are most often acquired spontaneous, posttraumatic, or postoperative) rather than congenital. Symptoms are absent, variable, or confusing because postincisional neuralgia may be indistinguishable from pain caused by a lumbar hernia. A flank bulge may be detectable, but the clinical diagnosis can be very difficult in obese and postoperative patients ***(Baker et al., 1987).***

Incisional hernia is a late complication following abdominal surgery, occurring as a result of breakdown or loss of fascial closure ***(Santora and Roslyn, 1993)***. The incidence after laparotomy has been reported as ranging between 4% and%12 in large series, but the true incidence is probably underestimated. Many incisional hernias are asymptomatic, but if symptoms are present, an incisional hernia may be associated with major morbidity, loss of time from productive employment, and diminished quality of life. Given the financial cost of incisional hernia repair and the disappointing recurrence rates up to 45%, incisional hernia remains a significant challenge for most surgeons ***(Yahchouchy-Chouillard et al., 2003)***.

A number of factors associated with incisional hernia have been identified, some of which are local, such as wound infection and surgical technique ***(Hodgson et al., 2000)*** and some, systemic, such as older age, male sex, and altered collagen metabolism. In addition, a lifestyle factor like obesity has been found to be associated with incisional hernia ***(Sorensen et al., 2005)***.

The risk factors for occurrence include factors related to patient's status, underlying disease, surgical technique and postoperative complications. Surgical technique of wound closure also plays a role (***Chowbey et al., 2006)*** Perioperative factors appear to have the most significant correlation to incisional hernia formation, with wound infection being the most consistently reported risk factor. Other perioperative factors include deep abscesses, perioperative

gastrointestinal complications and early reoperations ***(Chan and Chan, 2005)***.

Aim of the work

This study aims to evaluate the incidence and risk factors of development of lumbar incisional hernia and flank bulge following surgical flank approaches to the kidney.

Surgical Anatomy

Anatomy of posterior abdominal wall:

Posterior musculature and lumbodorsal fascia:

The posterior abdominal wall consists of fasciae, muscles and their vessels and spinal nerves. It is best described as that part of the abdominal wall lying between the two mid-dorsal lines, below the posterior attachments of the diaphragm and above the pelvis. It is continuous laterally with the anterolateral abdominal wall, superiorly with the posterior wall of the thorax behind the attachments of the diaphragm and inferiorly with the structures of the pelvis.

The lumbodorsal fascia originates from the lumbar vertebrae, a very strong and thick fascia, which extends anterolaterally from the lumbar spine. There are three distinct layers of the lumbodorsal fascia. All the three layers of the lumbodorsal fascia join to form a single thick aponeurosis lateral to the quadratus lumborum muscle before extending further anterolaterally, where they are contiguous with the aponeurosis of the transversus abdominis muscle ***(Kabalin, 2002).***

A vertical incision that parallels the lateral borders of the sacrospinalis and quadratus lumborum can be made through this lumbodorsal fascia, posteromedial to the first transverse muscle fibres of the transversus abdominis, to gain surgical access to the retroperitoneum and kidney without cutting muscle (the so-called lumbodorsal approach, or dorsal lumbotomy). The posterolateral

application of the peritoneal reflection also roughly approximates the anterior margin of this lumbodorsal fascia ***(Williams et al., 1995).***

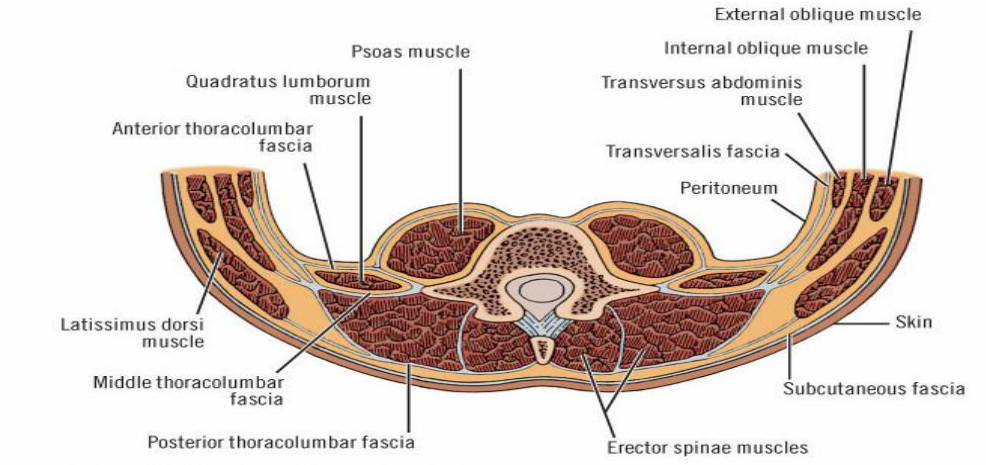

Fig. 1: Cross section of posterior abdominal wall (***Skandalakis et al., 1996)***

Anatomy of lumbar triangles:

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