The Relation Between the Distance of Rectus Plication and the Intra Abdominal Pressure Changes before and Immediately After Abdominoplasty

Thesis

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List of Contents

List of Tables

List of Figures

List of Figures Cont...

List of Figures Cont...

List of Abbreviations

Abb.	Full term
ACS	*Abdominal Compartment Syndrome*
CRD	*Rectus diastasis correction*
CVP	*Central venous pressure*
DVT	*Deep Vein Thrombosis*
ED	*Emergency doctor*
EOM	*External oblique muscles*
IAP	*Intra-abdominal pressure*
IPP	*Inspiratory pause pressure*
IQ	*Intra-quantile*
MTV	*Measured tidal volume*
PCWP	*Pulmonary capillary wedge pressure*
PDS	*Polydioxanone*
PEEP	*Positive end expiratory pressure*
PS	*Posterior sheeth.*
RD	*Rectus diastasis*
RDC	*Relative diastasis coefficient*

INTRODUCTION

Abdominoplasty or "tummy tuck" is a common cosmetic surgery procedure with a percentage of 65% of patients worldwide. It is used to make the abdomen flatter and more firm. The surgery involves the removal of excess skin and fat from the middle and lower abdomen and tighten the muscle and fascia of the anterior abdominal wall ***(Dixit and Wagh, 2013).***

This type of surgery is usually sought by patients with aprone abdomen or sagging skin after multiple pregnancies and normal aging process or massive weight loss patient ***(Liao, 2012).***

Whatever the reasons are, abdominoplasty is an effective procedure for improving the appearance of the abdomen and defining the waistline.

Diastasis of recti (also known as abdominal separation) is commonly defined as a gap of roughly 2.7 cm or greater between the medial edges of rectus abdominis muscle. This condition has no associated morbidity or mortality ***(Christakis and Fowler, 2007).***

The distance between the right and left rectus abdominis muscles is created by the stretching of the linea alba and consist of a connective collagen sheath created by the apponeurosis insertions of the transeverse abdomnis, internal oblique, and external oblique.

Diastasis of this muscle occurs principally in pregnant or postpartum women, the condition is caused by the stretching of the rectus abdominis by the growing uterus. It is more common in multiparous women due to repeated episodes of stretching. When the defect occurs during pregnancy, the uterus can sometimes be seen bulging through the abdominal wall beneath the skin. It was reported that women older than 30 years are more susceptible to develop diastasis recti ***(Sharma et al., 2014).***

However, conservative treatment to diastasis of recti in the form of exercises and physiotherapy can somehow help to reduce the size of diastasis recti, but its benifit as curative treatment for diastasis still doubtful.

While surgical correction for diastasis during the abdominoplasty can be considered as a definitive way for correction of diastasis by creating a plication or folding of the linea alba and suturing them together, this creates a tighter abdominal wall ***(Benjamin et al., 2014).***

The patient will notice improvement immediately after surgery but final results may take several months to become apparent. The outcomes of tummy tuck surgery will be permanent but the patient will be required to follow proper diet and exercise regimen to maintain the results ***(Thorek, 1999).***

Several previous studies have studied the changes that occur with Intra-abdominal pressure following abdominoplasty, but none of them studied the relation between recti diastasis distance and intra-abdominal pressure changes after rectofascial placation ***(Psillakis, 1978).***

The current study will validate these previous studies by demonstrating the changes in Intra-abdominal pressure following plication of recti in abdominoplasty and relating these changes of Intra-abdominal pressure to the distance of plication between the medial border of both recti.

AIM OF THE WORK

Aim of this study is to evaluate the relationship between the distance of recto-fascial plication and intra-abdominal pressure changes during and immediately after abdominoplasty.

Research Question

- Could the distance between the medial edges of the right and left rectus abdominis muscle influence the intra-abdominal pressure after rectus sheath plication?

Objectives

- Determine the influence of diastasis recti plication distance plication on intra-abdominal pressure in abdominoplasty.
- Evaluation of the variation in intra-abdominal pressure before and immediately after rectus sheath plication.

Chapter 1

EMBRYOLOGY OF THE ANTERIOR ABDOMINAL WALL

The abdominal wall begins to develop from the lateral plate of intraembryonic mesoderm. As differentiation proceeds, the intraembryonic mesoderm becomes segmented into proliferating somites forming the abdominal wall.

The cephalic fold is the most anterior and contains the foregut, the stomach and the mediastinal / thoracic contents, it also forms the epigastric abdominal wall. The caudal fold develops into the colon, rectum, bladder and the hypogastric abdominal wall.

The two internal folds develop into midgut and the lateral segment of the abdominal wall. All of these segments coalesce in the midline at the umbilicus.

Because the alimentary tract grows rapidly, at 6 to 8 weeks of gestation, all fetuses demonstrate a physiological herniation of the midgut, by the 11^{th} week, the midgut rotates and return back into abdominal wall cavity with the alimentary tract in continuity ***(Sabiston & Lyerly, 1994)*****, Fig. (1).**

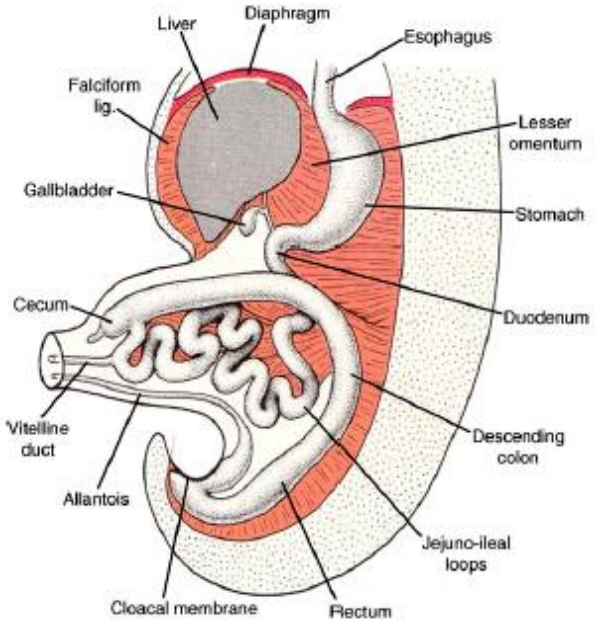

Figure (1): Embryo at 12 weeks at time of abdominal wall formation ***(Sadler, 1990).***

At an early stage, the abdominal wall is composed of only a membrane of connective tissue that is soon replaced by muscular buds from the dorsal myotomes. These muscular buds are segmentally connected to their corresponding neurovascular bundles. These buds fuse to form the definitive muscles ***(Sadler, 1990)***.

Large gap was described by ***Moore and Dalley (1999)*** in the skeletal system between the lower edge of the thorax and the upper edge of the pelvis. This gap is closed by muscles and their apponeurosis. It provides attachment points for the soft tissue and muscles of the abdominal wall.