Fibrin Glue versus Sutures for Mesh Fixation in open Repair of Uncomplicated Inguinal Hernia

Thesis

Submitted for partial fulfilment of Master Degree in General Surgery

By

Elsayed Hassan Elsayed Abdalhalem

M.B.B.Ch

Under Supervision of

Prof.Dr: Ahmed Abd Alaziz Abo Zaid

Professor of General Surgery

Faculty of Medicine – Ain Shams University

Assist. Prof.Dr: Hanna Habib Hanna

Assistant Professor of General Surgery

Faculty of Medicine – Ain Shams University

Dr. Mohamed Ibrahim Mohamed Ali

Lecturer of General Surgery

Faculty of Medicine – Ain Shams University

Faculty of Medicine

Ain Shams University

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قالوا
سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
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List of Abbreviations

Abbr.		Full-term
Ab	**:**	Antibody
ASA	**:**	American society Anesthesiology
ASIS	**:**	Anterior Superior Illic Spine
C°	**:**	Centigrade
Cm	**:**	Centimeter
CT	**:**	Computerized Tomography
DM	**:**	Diabetes Mellitus
DVT	**:**	Deep venous thrombosis
ECG	**:**	Electrocardiograhy
FDA	**:**	Food and drugs administration
FFP	**:**	Fresh frozen plasma
FG	**:**	Fibrin glue
FS	**:**	Fibrin Sealant
HTN	**:**	Hypertension
I.A.P	**:**	Intra-abdominal pressure
I.A.P	**:**	Intra-abdominal pressure
MRI	**:**	Magnetic Resonance Imaging
NPRS	**:**	Numeric pain rating scales
S/D	**:**	Standard Deviation
S/D	**:**	Standard Deviation
TAPP	**:**	Transabdominal preperitoneal
TEP	**:**	Totally extraperitoneal
U/S	**:**	Ultra sonoghraphy

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Introduction

Abdominal wall hernias are common, with a prevalence of 1.7% for all ages and 4% for those aged over 45 years. Inguinal hernias account for 75% of abdominal wall hernias, with a lifetime risk of 27% in men and 3% in women .**(Kingsnorth et al., 2003).**

In 2001-2002 about 70 000 inguinal hernia repairs (62 969 primary, 4939 recurrent) were done in England, requiring more than 100 000 hospital bed days. Ninety five per cent of patients presenting to primary care are male, and in men the incidence rises from 11 per 10 000 person years aged 16-24 years to 200 per 10 000 person years aged 75 years or above. **(Chow et al., 2007).**

The increasing use of mesh procedures in inguinal hernia surgery has led to a substantial decrease in the incidence of hernia recurrence. As a result, surgeons (and, increasingly, their patients) are now focused on other measures reflecting the success of hernia repair. The prevalence of postoperative pain syndromes after open and laparoscopic procedures has been reported to be as high as 30 %. **(Bay-Nielsen et al., 2001).**

The Lichtenstein technique is a standard procedure for open tension-free inguinal hernia repair performed using prosthetic meshes to strengthen the inguinal canal posterior wall **(Amid, 2004).**

Sutures and staples may strangulate muscle fibers, compress regional nerves, or give rise to a lesion, leading to incapacitating pain or dysesthesia Because of the Complications associated with sutured mesh fixation following open groin hernia repair have prompted surgeons to evaluate methods of atraumatic fixation, such as the use of human fibrin glue **(Alfieri et al., 2007).**

Fibrin glue is a biodegradable adhesive combining human-derived fibrinogen and thrombin that replicates the last step of the coagulation cascade. It has been used in a variety of surgical fields for its effectiveness, excellent local tolerability, and relative lack of adverse effects and contraindications. Its adhesive and hemostatic properties have been demonstrated in a number of experimental studies and clinical trials **(Canonico, 2003).**

Aim of the Work

The aim of this work is to compare between sutures and fibrin glue for mesh fixation in open inguinal hernioplasty with evaluation of operative time, post-operative pain, hospital stay, cost, return to normal life activity and recurrence.

Anatomy

Embryology:

Formation of the inguinal canal in males occurs concurrently with testicular descent prior to birth. The testes originate in the posterior abdominal cavity and, through certain signals, descend and ultimately reside in the scrotal cavity. This descent of the testis in males creates an inherent weakness in the abdominal wall at the inguinal canal. This weakness is important in the development of inguinal hernias. During normal testicular descent, the testis migrates caudally and traverses through various layers of the abdominal wall to end up in the scrotum. In females, the final event results in the ovum descending into the pelvis **(Gray, 2005).**

This process of testicular decent is assisted by a structure known as the gubernaculum, which forms on the inferior aspect of the gonad and signals descent and ultimately adherence of the gonad in its final destination. Failure for this event to occur in males leads to an undescended testis (testicle), otherwise known as cryptorchidism **(Gray, 2005).**

The muscle and fascial layers of the anterior abdominal wall continue inferiorly to form the layers covering the spermatic cord as it continues through the inguinal canal and into the scrotum. Around the 12th week of gestation, the processus vaginalis forms, which is an embryonic developmental outpouching of the peritoneum **(Gray, 2005).**

Layers of the abdominal wall in the inguinal region: (fig:1)

- Skin.
- Superficial fascia (Camper's & Scarpa's).
- Innominate fascia (Gallaudet). This may not always recognized as a distinct entity.
- External oblique aponeurosis including the inguinal, lacunar and reflected inguinal ligament. fig (1)
- Internal oblique muscle, ligment of henle and conjoint tendon.
- Transversus abdominis muscle and aponeurosis modified to conjoint tendon (Falx Inguinale).
- Transversalis fascia associated with the pectineal ligament (Cooper), iliopubic tract, transversalis fascia sling and the deep inguinal ring.
- Preperitoneal connessue and fat **(Condon, 2002).**

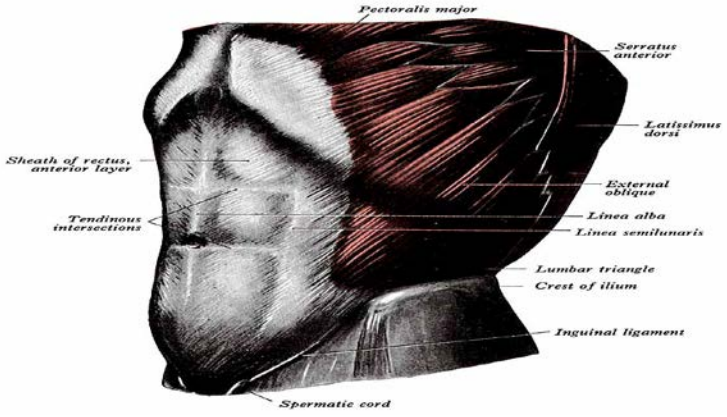

Figure (1): Anterior abdominal wall **(Towsend et al., 2004).**

Abdominal Skin

Skin of the anterior abdominal wall is thin and the distribution of hair varies with with sex, age and race **(Mc Minn, 2003).**

The superficial fascia

The superficial fascia is divided into a superficial part (Camper's fascia) and a deep part (Scarpa's fascia). The superficial part extends upwards on the abdominal wall and downwards over the penis (in males), scrotum, perineum, thighs and buttocks. The deep part extends from the abdominal wall to the penis (Buck's fascia), the scrotum (Dartos) and the perineum (Colles fascia) (***Skandalakis, 2004).***

External abdominal oblique muscle

The external abdominal oblique muscle is the largest and most superficial of the 3 paired, flat abdominal muscles. It arises from the lower 8 ribs and interdigitations of the serratus anterior muscle. As the external abdominal oblique courses in an inferior medial direction, its muscle fibers change from thick muscle to a fibrous aponeurosis that inserts medially in the linea alba. Inferiorly, the external abdominal oblique aponeurosis folds back on itself to form the inguinal ligament between the anterior superior iliac spine and the pubic tubercle before inserting onto the pubic tubercle and the anterior half of the iliac crest. Just medial to its insertion on the pubic tubercle, the aponeurosis divides and forms the superficial (or external) inguinal ring **(Gray, 2005).**

The external oblique aponeurosis joins the aponeurosis of the internal oblique and transversus abdominis muscle to form the anterior layers of the rectus sheath. This aponeurosis contributes to the three anatomical entities in the inguinal canal :a) Inguinal ligament (Poupart's), b) Lacunar ligament (Gimbernat's), c) Reflected inguinal ligament (Colle's), included sometimes in the pectineal ligament (Cooper's) which is also formed from tendinuous fibers of the internal oblique, transversus and pectineus muscles **(McMinn, 2003).**

Inguinal Ligament: fig (2)

The inguinal ligament, or the Poupart ligament, is the thickened, inferior border of the external abdominal oblique aponeurosis that extends from the anterior superior iliac spine to the pubic tubercle and forms the floor of the inguinal canal. At the medial aspect, some fibers divide posteriorly, attaching to the pectineal line to form the lacunar ligament, whereas other fibers extend superomedially to join the rectus sheath and linea alba, forming the reflected inguinal ligament. Only fascial attachments originate into or insert on the inguinal ligament **(Townsend et al., 2008).**

Lacunar ligament: fig. (2)

The lacunar ligament (pectineal part of the inguinal ligament) extends posteriorly and laterally from the medial part of the inguinal ligament to the medial end of the pectin pubis. It is triangular and measures about 2cm from base to apex. Its thin base is directed laterally, concave and forms the