STUDY OF DIFFERENT METHODS OF
SURGICAL REPAIR OF INGUINAL HERNIA

THESIS

SUBMITTED IN PARTIAL FULFILLMENT

FOR THE DEGREE   OF MASTER OF

SURGERY

BY

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1979

ACKNOWLEDGEMENT

This thesis has been done under the kind and
continuous supervision of Prof. Dr. M. Samir Abu-Zeid
Professor of surgery , Faculty of medicine , Ain-Shams
University . His guidance and instructions were in-
valuable both in selecting the subject supervision ,
advice and encouragement with the kind attitude of a
great professor and humble leader, makes it extremely
difficult for me to express may real gratitude towards
him.

I find great pleasure in expressing may gratitude
towards all those sincerely participated in completing
this work. the greatest credit must go to may professors
of surgery for their encouragement and guidance.

M. Emad.

بسم الله الرحمن الرحيم

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INTRODUCTION

Inguinal hernia is very common condition presenting to all hospitals, in very surgical ward there is an uncommon number of hernias.

The multiplicity of the procedures described for the repair of the inguinal canal following hernicectomy points to the fact that non of these procedures is completely satisfactory. This comes originally from the incomplete understanding of the delailed mechanism of formation of the inguinal hernia. Not only this but even the anatomical features are not completely and fully disclosed.

For prescribing a satisfactory repair for an inguinal canal which has been stretched and disturbed by a hernial sac and its contents, a complete understanding of the anatomy of all the structure and tissues involved is an essential prerequisit.

In this work we will deal with study of the different methods of surgical repair of inguinal hernia, and application of this to fifty cases of inguinal hernia in different ages and sexes. Sliding and recurrent hernia are also taken into consideration.

HISTORICAL ASPECTS

The early history of interest in the problem
of hernia is that of discipline of surgery . The
names associated so intimately with the subject of
hernia are familiar because of the pioneering thrust
these men gave to surgery in general e.g. celsus,Henri
de Mondeville and Ambroise pare.

The Egyptian papyri do not contain reference
to the operative treatment of hernia, but the papyrus
Ebers recommended diet and externally applied pressure
(truss ?) for its treatment .

Major development in the knowledge of hernial
anatomy and treatment occured during the eighteenth
century. Percival Pott (1714 - 1788) of London refuted
many of the old theories concerning the etiology of
hernia and methods of treatment based on these theories.
He was probably the first to suggest the congenital or-
igin of hernias .

The Modern Era of Hernial Surgery :
Nineteenth and Twentieth centuries.

Early in the nineteeth century, four men contributed
significant descriptions of inguinal anatomy : Camper,

Copper, Hesselbach, and Scarpa. in 1801, Pieter
camper published the description of the fascia that
bears his name .

The skilled anatomist Sir Astley Gooper (1768-
1841) published his two - volume work, the Anatomy
and surgical treatment of Abdominal Hernia - in 1804
and 1807. First descriptions credited to cooper in-
clude : Transversalis fascia, internal ring, inguinal
canal correct formation of femeral sheath by the trans-
versalis fascia, and the complete description of com-
per's fascia. He paid little attention to the "ligament
of the pubis" now called Cooper's ligment, and he cer-
tainly had no idea of how important this structure
would be come in the modern treatment of hernia. Frany
kaspar Hesselback (1759 - 1816) described the triangle
that bears his name in 1814 while he was prosector in
the anatomic theater of Wurzburg . Finally, in this
quortet of anatomists must be included Antonio Scarpa
(1747 - 1832) for whom a superficial layer of fascia
is named . He is also credited with being the first
to describ a sliding hernia (1821).

The nineteeth century brought anesthesia,hemostasis
and antisepsis, which made modern surgery possible .
As in every area of surgery, these advances allowed

rapid development of the science of hernial surgery. Wide acceptance soon was attained in Europe and America for the operation consisting of ligature and Excision of the sac at the external ring and suturing of the pillars around the cord to reduce the size of the ring This procedure was discribed in 1877 by Vin cenz Czerny (1842 - 1916). It is to Henry O. Marcy (1837 - 1924) of Boston that the modern era of hernial surgery is credited. His understanding of the importance of the transversalis fascia and of the anatomic contribution of fascial repair of the internal ring was reported in 1871 . Parenthetically, this was 12 years before Bassini did his first operation for hernia, and 16 years before Bassini published his first paper on the subject.

The modern era in the surgical treatment of inguinal hernia began with the work of H.O. Marcy of Boston (1837 - 1924) . The operation of Marcy consisted of opening the inguinal canal, isolating and transfixing the sac well within the internal ring, and removing its redundant portions. The transversales fascia was then sutured to the inguinal ligament for the purpose of reconstructing the posterior wall of the canal, narrowing the internal ring to its normal size and restoring

of the aponeurosis of the external oblique muscle in
performing the closure . The first mention of imbri-
cation is credited to E. Wyllys Andrews (1856-1927)
of chicago.

The use of iliopectineal ligment (cooper's
ligament) or ligamentum publicum superius, to anchor
the medial parietal wall in the repair is credited to
Georg lotheissen (1868 - 1935) of Vienna. The use
of the structure as an integral part of hernial repair
has been popularized by chester B. Mc Vay. of South
Dakota and the operation is known throughout the united
states as the Mc Vay repair.

The importance of the posterior inguinal wall in
the etiology as well as repair of hernias was recognized
relatively late. One of the strongest advocates of the
transversales fascia layer repair was P.W. Harrison
(1883 - 1962). A thickening in the transiversalis
fascia layer, the iliopublic tract , has received mini-
mal attention from anatomists and surgeons alike. Depi-
cted by Hesselbach (1814), it was described in detail
in 1836 by Thomson in the past several decades, use of
this structure has been recommended by a small number
of surgeons interested in the anatomy of the groin
(Clark and Hashimoto 1946 and Nyhus 1964).

After such a long period of interest in this anatomic area, controversy still abounds the last chapter on the history of groin anatomy and opera - tive repair of hernia defects has not been written.

The term "hernia" gives no due as to the ideas held by the ancients regarding its origin or nature. The word is derived from the greek "hernios" meaning a branch or off shoot, and is merely descriptive of the swelling that the lesion produces.

ANATOMY OF THE INGUINAL CANAL

The inguinal canal is an intermuscular slit
lying above the medial half of the inguinal ligment.
It commences at the deep inguinal ring, ends at the sup-
erficial inguinal ring, and transmits the spermatic
cord in the male and the round ligment of the uterus
in the female. Its anterior wall is formed by the
external oblique aponeurosis, assisted laterally by a
portion of the internal oblique muscle. Its floor is
the inrolled lower edge of the inguinal ligment, re-
inforced medially by the lacunar ligment (Gimbernat's
ligment) and fusing more laterally with transversails
fascia. Its roof is formed by the lower edges of the
internal oblique and transversus abdominis muscles,
which arch over from in front of the cord laterally to
behind the cord medially , where their conjoined apon-
euroses, constituting the conjoint tendon , are inserted
into the pectineal line of the pubic bone. The posterior
wall of the canal is formed by the strong conjoint ten-
don medially and the weak transversalis fascia laterally.

Anterior wall of the inguinal canal :

The fibres of the external oblique aponeurosis
run parallel with their lower borders the inguinal

ligment. Above its medial end they diverge from each
other to make a V- shaped opening, the superficial
inguinal ring. The lateral crus of this opening is
attached to pubic tubercle, the medial crus to pubic
crest near the symphysis. The intervening part of the
pubic crest receives no attachment from the external
oblique aponeurosis. At the point of junction of the
crura are shining fibres, running at right angles
across the external oblique oponeurosis. They bind
the crura together, and serve as a visible landmark
to the superficial ring at operation. They are the
intercrural fibres.

Superficial inguinal ring :

        This is a triangular gap, with sides of aponeurosis
(the crura) and abase of bone, the pubic crest. It
transmits the spermatic cord, to which it contributes
a fascial covering , the external spermatic facia. The
crura can be demonstrated only by sharp dissection,
cutting the external spermatic fascia free. Due to the
obliquity of the superficial ring, the cord, which passes
vertically downwards after emerging therefrom overlies
the pubic tubercle.For this resason the pubic tubercle

is not readily palpable from in front, and for the
satisfaction of the examiner and the comfort of the
subject, should be palpated in the living by a fin-
ger that invaginates the scrotum behind the cord.
From the attachment of the lateral crus (i.e. the
pubic tubercle) some fibres pass upwards behind the
cord and behind the medial crus to blend in the rectus
sheath with those from the opposite side. They are
known as the reflected part of the inguinal ligment.
They are not reflected fibres, and have nothing to do
with inguinal ligament. They constitute an additional
attachment, a posterior crus, of the aponeurosis of
the opposite external oblique.

The anterior wall of the inguinal canal is rein-
forced laterally by the lowest muscle fibres of inter-
nal oblique. The deep inguinal ring lies above the
midpoint of inguinal ligment , the internal oblique
fibres extend medial to this , for they arise from the
lateral two - thirds of the ligment.

The floor of the canal :

Holding a hip bone in the position it occupies
during life, anterior superior iliac spine and symphysis
pubis in the same vertical plane. The inguinal ligament,

joining anterior superior iliac. spine to pubic tuber-
cle. The pectineal line of pubic bone lies superior
to it. Thus the lacunor (Gimbermat's) ligment fill-
ing the angle between inguinal ligament and pectineal
line, passes upwards from the ligament to the bone .
Its abdominal surface faces forwards as well as upwards.
Its femoral surface faces backwards as well as down-
wards. it lies in the floor of inguinal canal, lateral
to its attachment the incurved edge of the inguinal
ligament forms a gutter which floors in the inguinal
canal. The Transversalis fascia is fused with this
part of the inguinal ligment.

Roof of the canal :

This is formed by the arched lower borders of
the internal oblique and transversus abdominis muscles.
Each arises form the hollow of the inrolled lower edge
of the inguinal ligment but their precise attachments
need to be appreciated separately. The internal oblique
muscle arises by fleshy fibres from lateral two-thirds
of inguinal ligament. The fibres arch madially and
downwards, merging into a flat aponeurosis. The most
lateral fibres, those arising from just below the ant-
erior superior iliac spine, arch downwards to reach

the symphysis pubis, in front of rectus abdominis.
The remaining fibres arch concentrically within the
former, passing in front of the rectus abdominis
along the pubic crest as for as the pubic tubercle
and then extending laterally along the pectineal line
as far as the crescentic edge of Gimbernat's ligment.
These lateral fibres, fused with the underlying Trans-
versus aponeurosis, constitute with them the conjoint
tenden. The transversus abdominis lies more laterally
at its origin , coming from only the lateral half of the
inguinal ligment, by fleshy fibres deep to those of
the internal oblique. They arch downwards in front of
rectus abdominis, where the Pleshy fibres are replaced
by tendinous ones, to make an aponeurosis that is atta-
ched along the pubic crest and extends out along the
pectineal line, fusing inseparably with the aponeurosis
of the internal oblique. The conjoint tendon and the
lacunar (Gimbernat's) ligment, attached in common
to the pectineal line, lies in planes at right angles
to each other. The deep inguinal ring lies in the
angle between the edge of the transversus and the
inguinal ligment. Since the internal oblique muscle
arises a little more medially than this, it lies in
front of the deep ring. The muscular arch of the roof