

Surgical Repair of Umbilical Hernia in Children

A Thesis

*In Partial Fulfillment of Master Degree
in General surgery*

Submitted by

Taha Mohamed Talaat El Diehy
M.B.B.Ch November 2012

Supervised by

Dr. Hosam El Den El Azazy

*Professor of General Surgery
Faculty of Medicine - Ain Shams University*

Dr. Mohammed Hesham Ahmed

*Lecturer of Pediatric Surgery
Faculty of Medicine - Ain Shams University*

Dr. Ahmed Nabil El Hofy

*Lecturer of General Surgery
Faculty of Medicine - Ain Shams University*

*Faculty of Medicine
Ain Shams University
2018*

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم العظيم

صدق الله العظيم

سورة البقرة الآية: ٣٢

Acknowledgment

*First and foremost, I feel always indebted to **ALLAH**, the
Most Kind and Most Merciful.*

*I'd like to express my respectful thanks and profound
gratitude to **Dr. Hosam El Den El Azazy**, Professor of
General Surgery Faculty of Medicine - Ain Shams University
for his keen guidance, kind supervision, valuable advice and
continuous encouragement, which made possible the
completion of this work.*

*I am also delighted to express my deepest gratitude and
thanks to **Dr. Mohammed Hesham Ahmed**, Lecturer of
Pediatric Surgery Faculty of Medicine - Ain Shams University,
for his kind care, continuous supervision, valuable
instructions, constant help and great assistance throughout
this work.*

*I am deeply thankful to **Dr. Ahmed Mabil El
Hofy**, Lecturer of General Surgery Faculty of Medicine - Ain
Shams University, for his great help, active participation and
guidance.*

Taha Mohamed Talaat El Diehy

DEDICATION

To my parents,

The reason of what I become today

Thanks for your great support and encouraging me to

believe in my self

To my wife,

I am really grateful to you

You have been my inspiration and soul mate.

List of Contents

Title	Page No.
List of Tables	6
List of Figures	7
List of Abbreviations	10
Introduction	1
Aim of the Work	13
Review of Literature	14
Materials & Methods	66
Results	77
Discussion	90
Summary & Conclusion	97
References	99
Arabic Summary	—

List of Tables

Table No.	Title	Page No.
Table (1):	Comparison between group I (Purse string suture) & group II (Transverse interrupted suture) as regard Age.....	77
Table (2):	Comparison between group I (Purse string suture) & group II (Transverse interrupted suture) as regard gender.	79
Table (3):	Comparison between group I (Purse string suture) & group II (Transverse interrupted sutures) as regard Umblicoplasty.	81
Table (4):	Comparison between group I (Purse string suture) & group II (Transverse interrupted suture) as regard Umbilical sheath defect.	83
Table (5):	Comparison between group I (Purse string suture) & group II (Transverse interrupted suture) as regard Time of operation (min).	85
Table (6):	Comparison between group I (Purse string suture) & group II (Transverse interrupted suture) as regard First and Second Visit.....	87

List of Figures

Fig. No.	Title	Page No.
Figure (1):	Egyptian Papyrus of Ebers.	14
Figure (2):	An elderly man suffering from umbilical hernia can be seen in the tomb of Horemheb, at Aswan	15
Figure (3):	Akhenaten, Nefertiti and their children, that both Nefertiti and the child had obvious bulges around the umbilicus.....	15
Figure (4):	The developing umbilical cord.....	20
Figure (5):	Umbilical region viewed from the posterior surface of the abdominal wall of an infant with the umbilical cord attached	21
Figure (6):	Anatomic relationship between the umbilicus and its embryologic attachments.....	22
Figure (7):	Variations in the umbilical ring structure	22
Figure (8):	Flat muscles.....	26
Figure (9):	Vertical muscles and Rectus sheath.	28
Figure (10):	Blood supply of anterior abdominal wall.	32
Figure (11):	Doppler ultrasound of umbilical cord presentation at 32 weeks	35
Figure (12):	African child with an UH, which is a usual and common condition there	39
Figure (13):	A 5 years old girl with a Beckwith–Wiedemann syndrome (left-sided hemihypertrophy seen at her thigh) with a protruded UH.....	40
Figure (14):	A typical congenital umbilical cord hernia with normal umbilical ring width, strip of skin creeping over the cord and normal continuity of cord distal to hernia.....	45
Figure (15):	Proboscoïd umbilical hernia.....	46
Figure (16):	Direct umbilical hernia	48
Figure (17):	Oblique UH, arising from the superior edge of umbilicus.....	49

List of Figures Cont...

Fig. No.	Title	Page No.
Figure (18):	Small umbilical hernia.....	52
Figure (19):	Huge umbilical hernia. Landmarks for measurement of the sizes of the umbilical hernia, diameter of the basis (DB) and the height (H)	53
Figure (20):	Sessile huge umbilical hernia.....	54
Figure (21):	Pedunculate huge umbilical hernia.....	55
Figure (22):	Hornlike huge umbilical hernia	55
Figure (23):	Emergency surgery revealed strangulated intestine and Omentum.	63
Figure (24):	Diagram of strangulated umbilical hernia.	64
Figure (25):	Skin erosion and ulcerations.	64
Figure (26):	Diagram of Purse string closure of the rectus sheath.	69
Figure (27):	Schematic of the technique	70
Figure (28):	Steps of the procedure	72
Figure (29):	A) Proboscoïd umbilical hernia. B) Proboscoïd umbilicus showing two stay sutures at the apex of the redundant skin. C) The two unequal half-cone skin flaps before hernia repair. D) Closure of the umbilical sheath defect by transverse interrupted sutures. E) The new umbilicus immediately post operative. F) The new umbilicus after one week of umbilicoplasty. G-H) A case of bilateral inguinal hernia with UH showing closure of the U.sheath defect by purse string sutures technique.....	75
Figure (30):	Comparison between group I (Purse string suture) & group II (Transverse interrupted suture) as regard Age.	78

List of Figures Cont...

Fig. No.	Title	Page No.
Figure (31):	Comparison between group I (Purse string suture) & group II (Transverse interrupted suture) as regard gender.	80
Figure (32):	Comparison between group I (Purse string suture) & group II (Transverse interrupted suture) as regard Umbilicoplasty	82
Figure (33):	Comparison between group I (Purse string suture) & group II (Transverse interrupted suture) as regard Umbilical sheath defect.	84
Figure (34):	Comparison between group I (Purse string suture) & group II (Transverse interrupted suture) as regard Time of operation (min).	86
Figure (35):	Comparison between group I (Purse string suture) & group II (Transverse interrupted suture) as regard First Visit.	88
Figure (36):	Comparison between group I (Purse string suture) & group II (Transverse interrupted suture) as regard Second Visit.	89

List of Abbreviations

Abb.	Full term
A.D	Anno Domini
B.C	before Christ
CHUC	Congenital hernia of umbilical cord
Cm.....	centimeter
CT	Computed tomography
DB.....	Diameter of the base
F	Fascia
Fig.....	Figure
H	Height
HB.....	hemoglobin
HS	Highly significant
HUH	Huge umbilical hernia
IQR.....	Interquartile range
LT.....	Left
N	Number
NICU	Neonatal intensive care unit
NO.....	Number
NS.....	Non significant
P	p-value (level of significance)
PUH.....	Proboscoid umbilical hernia
S	Significant
SD	Standard deviation
SPSS	statistical package for social sciences
UC.....	Umbilical cord
UG.....	Umbilical granuloma
UH	Umbilical hernia
UL.....	Umbilical ligament
UR.....	Umbilical ring
US	Ultra sound
UV.....	Umbilical vein

INTRODUCTION

Umbilical hernia is defined as a visible protrusion on straining or crying which develops as a result of incomplete ring closure, it is very common in young children. The incidence ranges from 10% to 25% and is increased in girls, African American children, and low-birth-weight babies (*Cilley, 2006*).

Umbilical hernias have been associated with multiple syndromes and conditions including Hypothyroidism, mucopolysaccharidosis, Down syndrome, Beckwith-Wiedemann syndrome, and exomphalos-macroglossia Syndrome (*Kokoska and Weber, 2003*).

The first umbilical hernia repair was mentioned by Celsus in the early first century. However, the majority of cases up to the 18th century were managed with abdominal binders. In 1890, Nota reported the first series of children undergoing hernia reduction and purse-string closure of the fascial defect. Mayo recommended transverse fascial closure in 1901 and his technique remains most frequently utilized today (*Zendejas, et al., 2011*).

The majority of umbilical hernias close spontaneously at 3 to 4 years of age. However, there are no good long-term prospective studies that document spontaneous hernia closure rates with regard to various sized defects. Hernia straps or buttresses, in addition to potentially irritating local skin,

actually delay closure by alleviating the local stress that is necessary for promoting muscular and fascial strengthening (*Fall et al., 2006*).

Bowel incarceration or strangulation is extremely rare and is the only absolute indication for urgent surgical repair. Relative surgical indications take into account the 2 factors most associated with a decreased likelihood of spontaneous closure: age greater than 3 to 5 years and fascial defect size greater than 1.5 to 2 cm & also when there is a need for general anesthesia during concurrent minor otolaryngologic, orthopedic, or other procedures(*Brown et al., 2006*).

If the child has a tender umbilical mass, the hernia may be reduced by milking the air out of the incarcerated loop of intestine and applying firm, steady pressure on the incarcerated mass. Admitting a patient for observation to rule out peritonitis and performing the operation the next day are appropriate. If the incarceration resists reduction, an emergency procedure is required. In an infant with an inguinal hernia and a concomitant umbilical hernia, the umbilical hernia should generally be left alone because it will probably close spontaneously (*Merci, 2006*).

AIM OF THE WORK

To compare between umbilical hernia repair of rectus sheath with closure by interrupted sutures and purse string technique regarding operative time, intra operative complications (bleeding, intestinal injury), and post-operative complications (edema, hematoma formation, Seroma formation, cosmetic appearance & recurrence).

REVIEW OF LITERATURE

Historical Review

The first references to umbilical hernia were recorded in the Egyptian Papyrus of Ebers (ca. 1552 B.C.). The Ancient Egyptian sculptures and artist were so meticulous to draw a harvester with an aberrant umbilical hernia seen above a truss, which may be an indicator for the failure of this measure in management of UH (Fig.1).



Figure (1): Egyptian Papyrus of Ebers.

An elderly man suffering from umbilical hernia can be seen in the tomb of Horemheb, at Aswan, Egypt (Fig. 2).

Also, it is clear from the famous carving of Akhenaten, Nefertiti and their children that both Nefertiti and the child had

obvious bulges around the umbilicus with a query umbilical hernias (Fig.3).



Figure (2): An elderly man suffering from umbilical hernia can be seen in the tomb of Horemheb, at Aswan



Figure (3): Akhenaten, Nefertiti and their children, that both Nefertiti and the child had obvious bulges around the umbilicus

The formal description of umbilical hernias comes from the Hindu physician Charaka in his writings dated A.D.one. The ancient Jews also recognized umbilical hernias and treated them conservatively. Celsus, in the first century A.D., treated umbilical hernias with an elastic suture, where an elastic cord of 30–40 cm long is passed around the base of the hernia with a long-curved needle worked through horizontally under the skin. The hernia is then reduced and held in place with the finger,