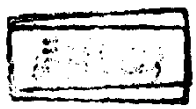
LAPAROSCOPIC SURGERY UPDATING



Essay

Submitted for Partial Fulfillment of the master degree (General Surgery)

By

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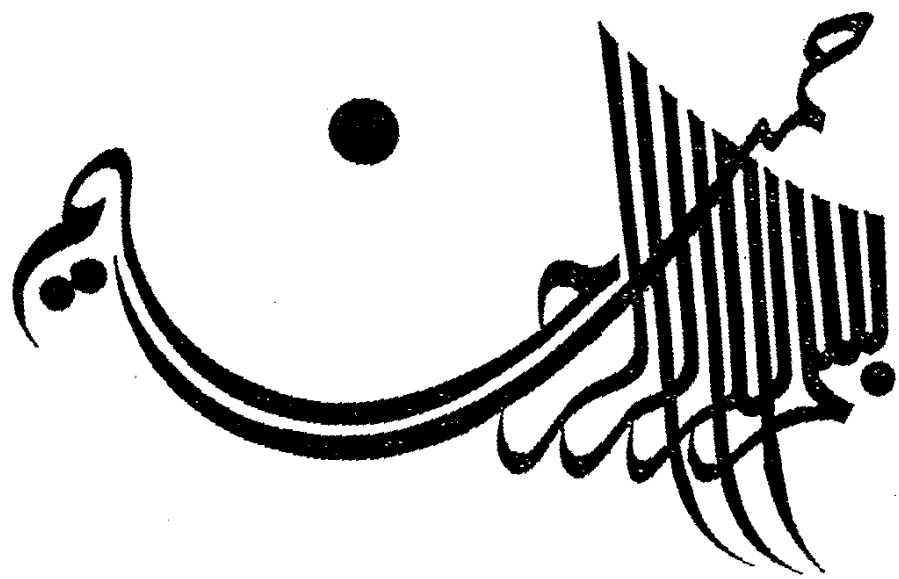
1993



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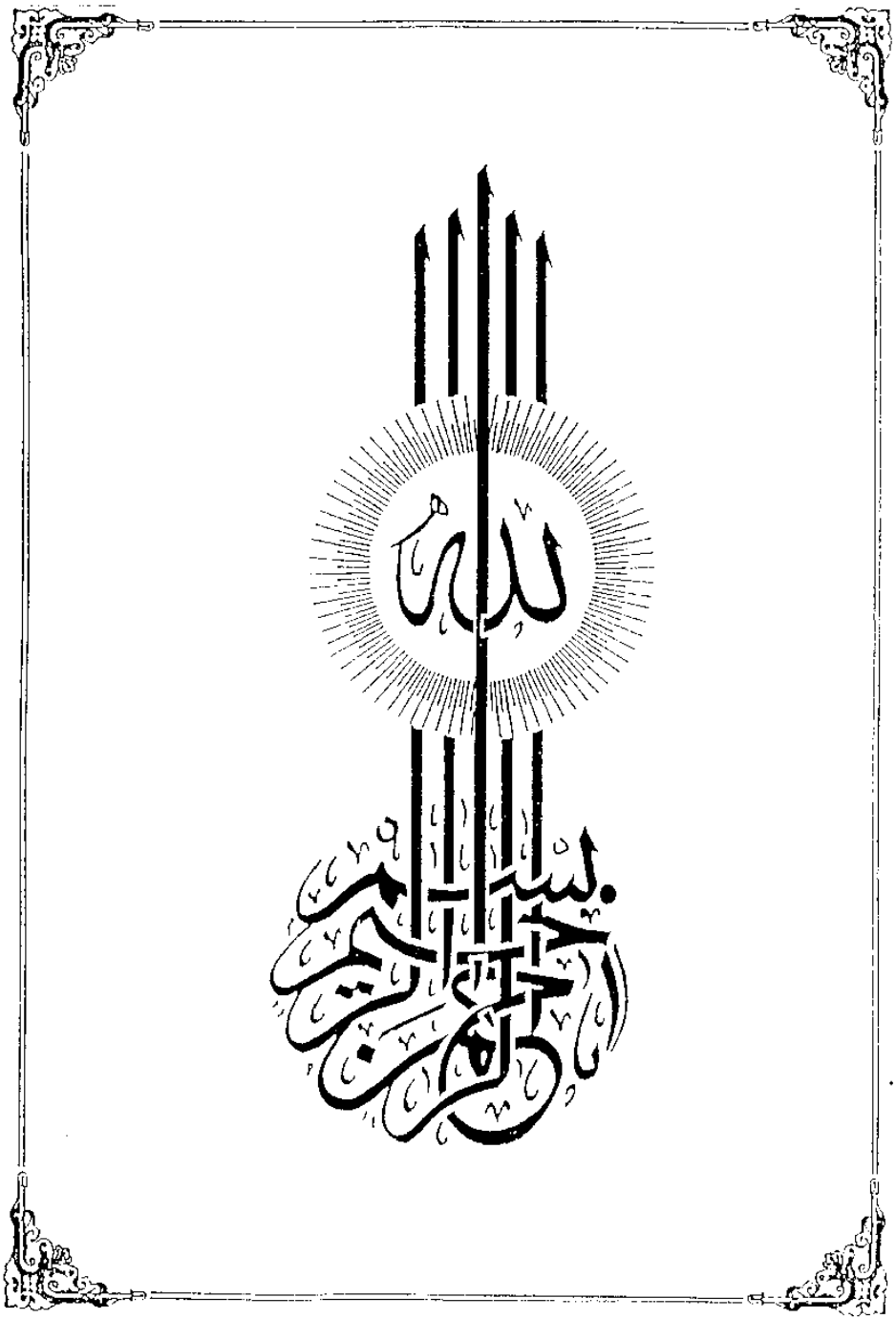
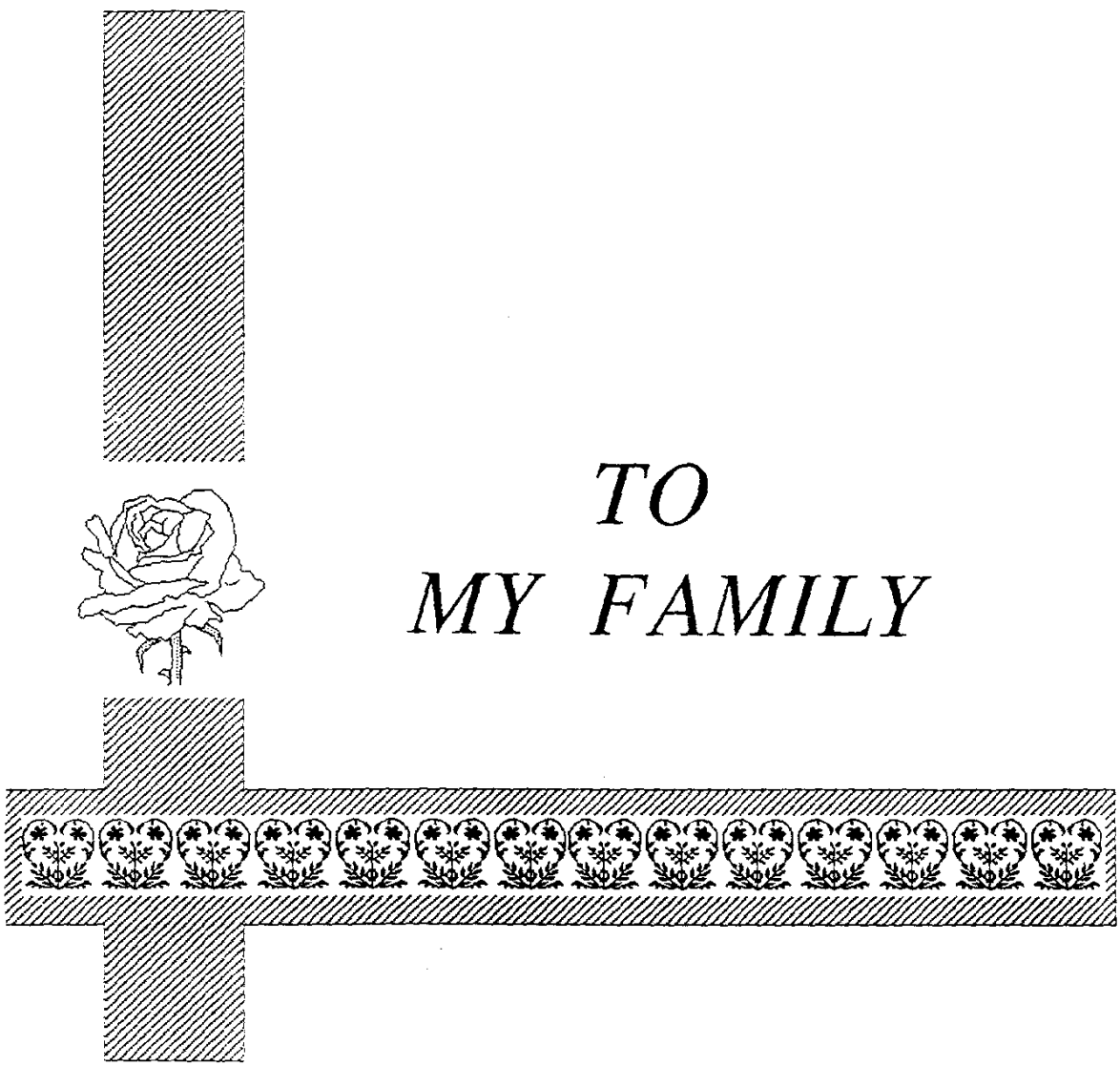


ACKNOWLEDGEMENT

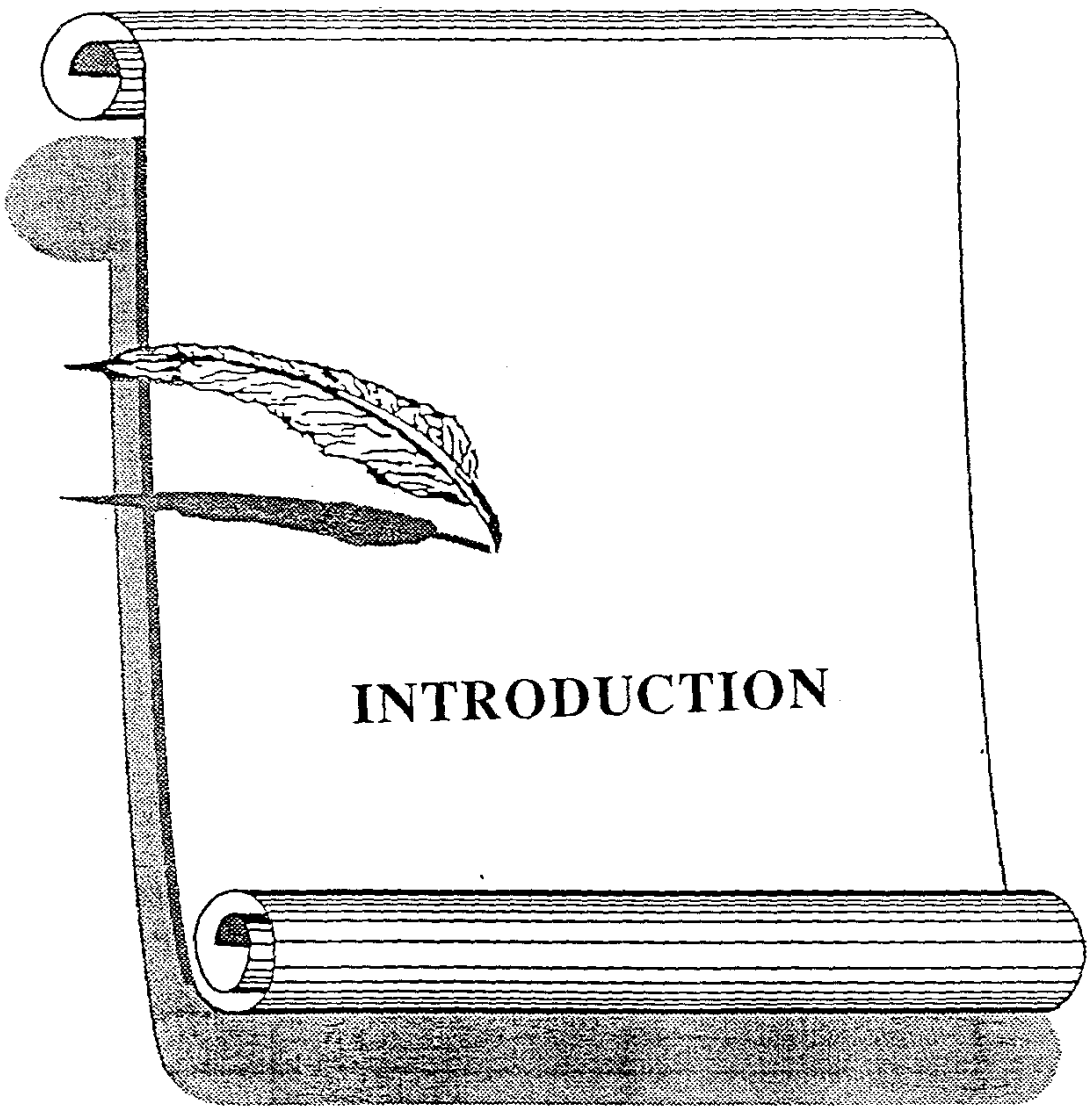
I would like to express my deepest gratitude to Prof. Dr. **El-Sayed El-Maharakawy** *Professor of general surgery for his valuable supervision and devotion to inspire in me the Noble charcter of fine surgeon and scientific research worker. He was kind enough to suggest implement, supervise and revise the whole work. Without this supervision, I would have never been able to write this essay*

I am deeply indebted to Dr. **Ashraf El-Zoughbi** *Lecturer in general surgery, for his kind supervision, guidance, unfailing advice and continuous encouragement through out the whole work.*



TO
MY FAMILY

Contents



INTRODUCTION

INTRODCUTION

Laparoscopic surgery is evolving with expanding potential with both therapeutic and diagnostic benefits. Although Laparoscopy has been an accepted treatment modality since first described by kelling and Ott in 1901, efforts to incorporate this approach into general surgery have largely been fruitless until the technological advances in optics, light transmission, television display and the introduction of miniature ultrasonic and laparoscopic laser techniques. *[Duppler., 1992].*

The success of laparoscopic cholecystectomy led to wider application of therapeutic laparoscopy to include most abdominal operations. Along with the benefits created by laparoscopic therapeutic intervention in biliary tract disease, appendicitis, abdominal wall hernia , peptic ulcer and esophageal reflux, new awareness has been kindled of the advantages of laparoscopy for pediatric surgery. *[Soper et al., 1992].*

Diagnostic laparoscopy has long history but with the further advances of videolaparoscopy, and the inclusion of television monitoring, current techniques of laparoscopy using improved imaging have led to wide applications in the diagnosis of abdominal disease. Laparoscopy being useful tool in liver diseases, suspected metastases, ascites of unknown

origin and abdominal diagnostic dilemmas where proved its superiority over ultrasonography *[Watt et al., 1989]*.

In patient with malignant disease it permits assessment of the extent of the lesion and enables accurate selection of the mode of therapy *[Lightdale., 1982]*.

Aim of study:

The aim of this work is to study the modern use of laparoscopy as safe and accurate diagnostic and therapeutic procedure showing its advantages and limitations in an attempt to bring it into awarness of medical profession.

HISTORY AND EQUIPMENT OF LAPAROSCOPY

HISTORY OF LAPAROSCOPY

The broad field of endoscopy of which laparoscopy is specialized component had its earlist begining with light transmitter developed by Bozzoni (1805) of Frankfurt who visualized the interior of the urethera in a human by using candle light and tube as an endoscope *[Gunning et al., 1991].*

Credit for the origin of laparoscopy is usually given to George kelling, who was the first to examine the abdominal cavity with an endoscope. This milestone, reported in 1901, was performed in a live dog using a cystoscope. Kelling named the procedure "Koelioskopie" *[Stellato., 1992].*

Alhough kelling later reported experience in humans, the first major series of laparoscopies in man is attributed to Jacobaeus, reported in 1911. Jacobaeus, efforts were not confined to examining the abdomen but also the thorax. His initial experience with this procedure was restricted to patients with ascites, but he later expanded its indications. One hundred fifteen examinations of the chest and abdominal cavities were performed in 72 patients. laparoscopic identifications of syphilis, tuberculosis, cirrhosis, and malignancy were reported in this major clinical publication. *[Stellato., 1992].*

The real impetus for modern laparoscopy emanated from the work of the hepatologist Kalk, who introduced a number of

major innovations including a 135-degrees lens system and the dual -trocar techniques. This opened the way for diagnostic and therapeutic technique. In 1951, Kalk reported a personal series of 2000 laparoscopies without any deaths *[Gunning et al., 1991]*.

In 1933, Fervers reviewed his experience with 50 patients and recommended changing from room air to oxygen or CO_2 as an insufflating agent, while in 1938 Veress invented his spring - loaded needle, which became the instrument of choice to create a pneumoperitoneum *[Berci et al., 1986]*.

A landmark paper was published in 1937 by Ruddock. Ruddock titled his report "peritoneoscopy" and detailed a personal experience of 500 cases over a 4- year period. In this series , 39 biopsies were taken -one of the earliest reports of laparoscopic biopsy *[Stellato., 1992]*.

Despite the technical advance allowing for safe and improved laparoscopy, general surgeons have been reluctant to use this procedure until relatively recently. Acceptance of laparoscopy into general surgery awaited the development of the computer chip television camera in 1980, which allowed videolaparoscopy to be performed. Semm (1983) performed the first appendectomy through a laparoscope. The first cholecystectomy was described 1989. In recent years there has been remarkable advancement of laparoscopic surgical procedures to the extent that it can replace many primarily open abdominal procedures. *[Gunning et al., 1991]*.

INSTRUMENTS AND EQUIPMENT FOR LAPAROSCOPIC SURGERY

A. Non-optical Equipment:

Severel types of non-optical equipment are essential for endoscopic surgery. These instruments include:

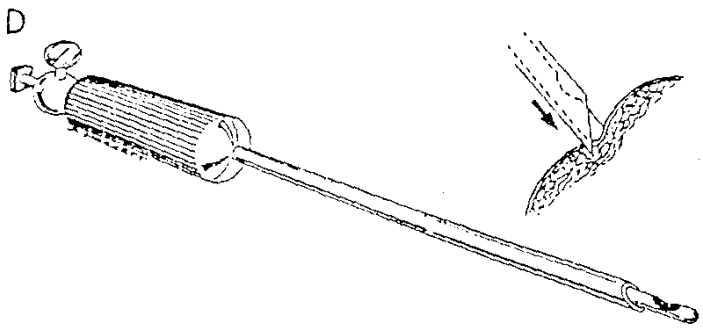
1. Devices for induction of pneumoperitoneum.
2. Cannulae and trocars for introduction of the laparoscope and ancillary surgical instruments.
3. Hemostatic and dissection devices including lasers or electrocautery.
4. Irrigation-aspiration systems to maintain a meticulous surgical field. *[Klein., 1991].*

Equipments for establishment of pneumoperitonum:

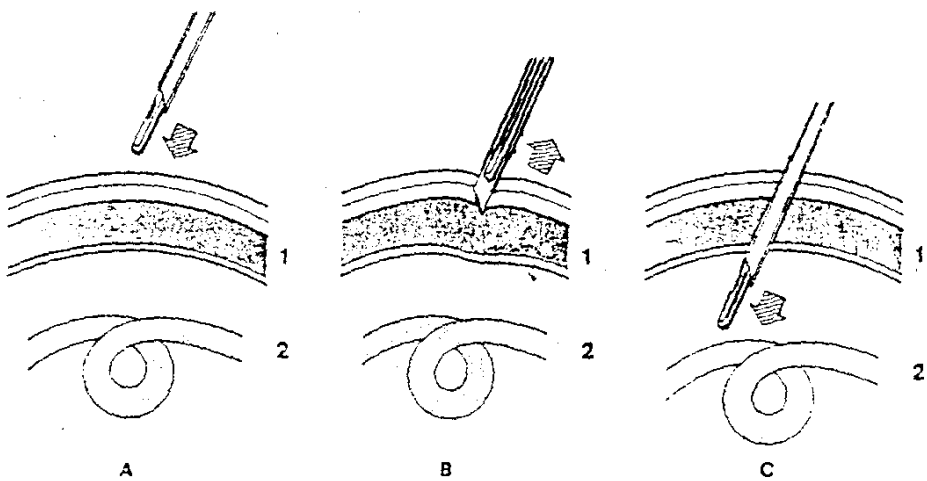
Insufflation needles:

a) The veress needle continues to be the standard instrument used for creation of the pneumoperitoneum. It consists of a sharp outer sheath and a blunt, spring - loaded inner cannula, which helps to protect the intra-abdominal organs from injury (Fig. 1,2) *[Duppler, 1992].*

b) The Hasson cannula, which is used for open laparoscopy, is inserted into the peritoneal cavity under direct vision. The indication for such an approach is usually in the setting of prior surgery when viscera might be adherent to the body wall and make a blind puncture hazardous. Hasson



(Fig.1) The veress pneumoperitoneum needle.



(Fig.2) The veress needle mechanism during tissue penetration.

device has a blunt obturator trocar, a cone-shaped sleeve, and a suture - holding component. The blunt obturator serves as an atraumatic guide and pushes away intraperitoneal organs that contact the cannula. Because its insertion follows surgical incision of the abdominal wall, the risk of trauma is lessened. The main function of the sleeve is to obliterate the fascial opening and thereby help to maintain the pneumoperitoneum (Fig. 3). *[Klein., 1991].*

c) Foures - kuss needle: This device is 65 mm long and 1.5 mm in diameter and has a sharp tipped removable inner cor surrounded by an outer sleeve with lateral holes. The advantages of this needle are its thin profile and the ability to insufflate through the lateral holes when the tip is impacted in *tissues e.g. omentum, however this device is not widely used. [Klein., 1991].*

Insufflation devices

Presently two types of insufflators are used the automatic insufflators and the manual insufflators. The automatic insufflator displays the following indicators or controles (Fig. 4):

1) Gas flow control indicator.

2) Intra-abdominal pressure indicator, with a warning red zone after 33 mmHg is reached (the normal intra-abdominal pressure is 10 - 18 mmHg).

3) On-off insufflator control.