VALUE OF

LAPAROSCOPY IN SURGURY

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Contents .

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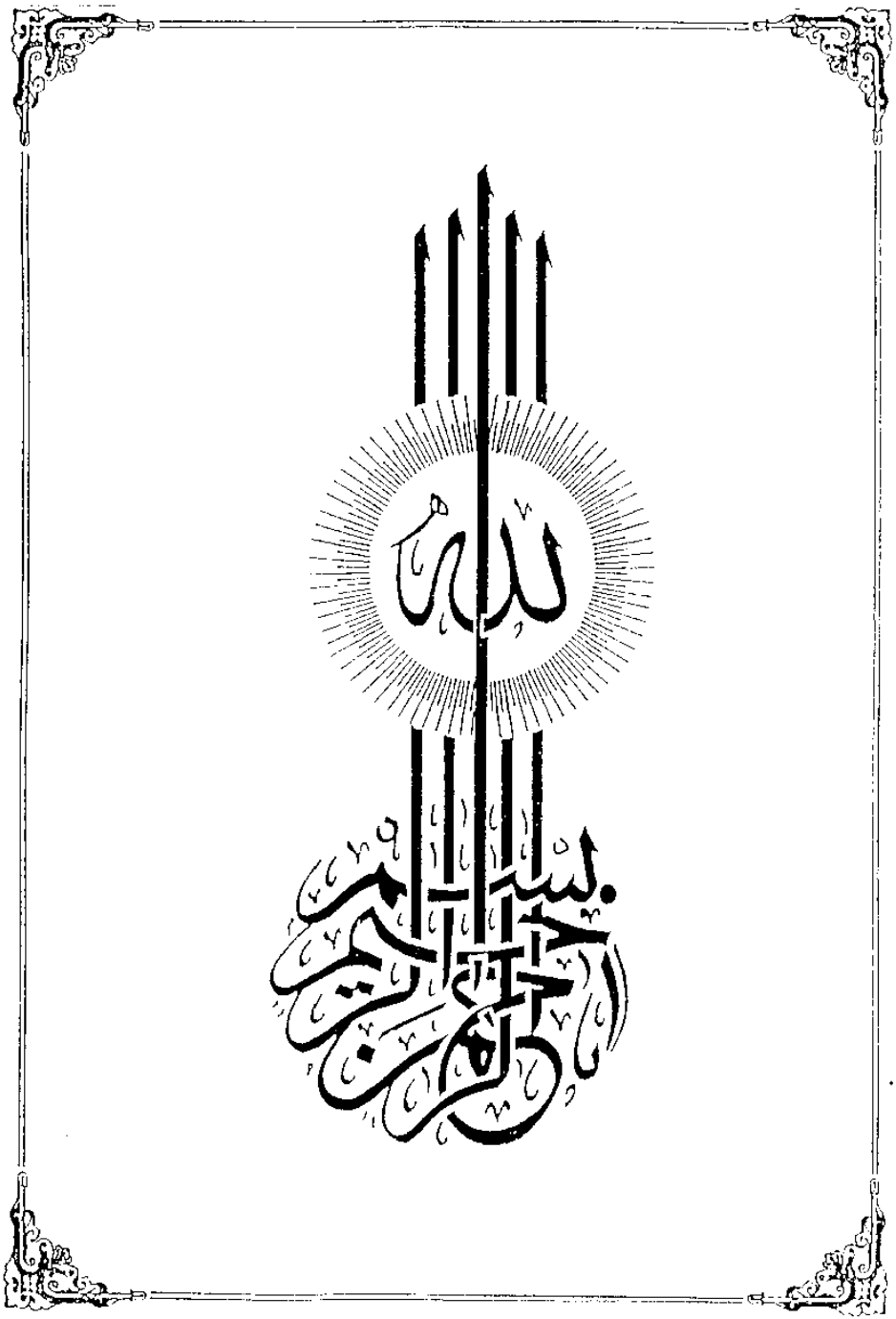

Laparoscopy is a valuable diagnostic technique. It permits the definite diagnosis of many abdominal diseases in earlier stages, leading to elimination of many unnecessary laparotomies.

In the field of oncology, laparoscopy helps us in the selection of the operable cases. It fasilitates the differentiation between primary and secondary tumours especially in liver carcinoma.

Also, laparoscopy has a good value in the diagonsis of unsettled cases of acute abdomen and the amount of damage in cases of abdominal trauma. In the gynaecological field, it is considered to be a good diagnostic tool in explanation of vague pain of pelvic origin.

In operable cases, laparoscopy will guide the surgeon to deal with the cause directly, decreasing the time, effort and postoperative morbidities.

Due to technriqual advancement the scope of laparoscopy has increased its capabilites. Many surgical procedures such as biopsy, division of adhesions and removal of a foreign body can be conducted through it. Coloured films and closed circuits television programs become available for laparoscopy which is used in the teaching fields.

This work will give us a look on the history of laparoscopy, its development, the instruments used, its technique, the indications, the contraindications and the complications.

The History of Laparoscopy:-

The first attempt to visualize the interior of a body was made in germany by Bozzani (1805); who visualized the human urethra using candle - light and a tube as endoscope. By the end of th 19 th century, endoscopie procedures such as cystoscopy, laryngoscopy, oesophagoscopy and laparoscopy were all well established in dialy clinical use (cali,1980)

The first attempt to visualize the peritoneal cavity was made late by ott (1901), who made a small abdominal wall incision, introduced a speculum, and inspeced the peritoneal cavity using a head mirror. In germany, Kelling (1901) made a more comprehensive demonstration. He inserted a needle into the peritoneal cavity of a living dog, distended it with air, and inspect the peritoneum via another site using a systoscope. Jacobaeus (1910) applied the same technique to human beings. Orndoff (1920) developed a trocar with a sharp pyramidal tip for a more convenient puncture of the abdominal wall, he also added an automatic valve to the sheath to prevent

an insufflation gas. Kalk (1929) was the first to use a second pu
ıcture for liver biopasy procedures.

ıvers (1938) described the techique and instruments required to
ɔly electrosurgury via the laparoscope. Veress (1938)introduced
s famous pneume-peritoneum needle, and could thus avoid many intra
ɔminal injuries. The introduction of quartz's rods to transmit
ght, on 1952, (Hopkin's and Kapany), revolutionized endoscopy;
ght sources were no more located at the distal end of a telescope.
i the risk of the electrical and the thermal burns were no more
isted: it also permitted photography.

A dramatic change in endoscopy were introduced by fiber - optics.
loured films and closed circuits television programs became avail-
le for the endoscopits . (Quint, 1977).

Instruments

The intruments and sets required for laparoscopy are the teles-
ɔpe, the insufflation set, the light source and cables, the main and
ɔcandary trocars and their sheaths, the auxiliary instruments and the
ɔndling forceps. The surgeon may be sufficed with a diagnostic
ɔlescope in non operative procedures, since it

tive telescope, but this will depend on the case. The five m m. telescope is sufficient for routine pelvic use, while the ten m m. is necessary for upper abdominal cancer detection, biopsy procedures, photograhy and teaching purposes. For these , it was recarded to have more than one type and size of a laparoscope. (Cali, 1980).

The telescope.

The telescope may serve either as pure diagnostic or for both diagnostic and operative purposes. A diagnostie telescope is basically similar to a cystoscope, the difference is in the more light projection and wider angle of view of the telescope. In fact, some institutions are using existing cystoscopes for pure diagnostie laparoscopic procedures but this is rather primitive . Telescopes are available in various sizes, the largest of which is the ten mm . size. Increasing the size is intended for better illumination, wider viewing field, larger image,less distortion and better photographic quality. Larger diameter requires a larger incision, a larger trocar tip anddeeper pentration during insertion. According to Cali (1980), one should use the smallest size that would achieve the objectives of the procedure .

ole, instruments are introduced through a lower right quadrant
cision through a second incision. This is not necessary when an
erating set is available; as one is able to view and operate thr-
gh the telescope, utelizing one incision Since the operative one
s the advantage of being formed of two separate channels for vis-
n and introduction of the instruments.

An operating laparoscope is ideal For introducing different instru-
nts and resecting biopsy specimens. Introduction of instruments
rough a second puncture confirms many technical advantages as using
e auxillary instruments. Cdution should be present when applying
ectrocoagulation via an operating telescope, since part of the
sual field is obscured by the diathermy instrument, and burns may
produced. (Cali, 1980).

Recenty, a laparoscope which has a flexible end became avail-
le for use, its end be rotated ninty degrees in two directions, and
n visualize the place by a proximal dial. The scope itself has a
cussing dial that enable most endoscopists to do without their eye
lasses. More recenty, an operating telescope with two channels,
rough which two forceps may be introduced simultaneosly, by Ushida
1981) is now available.

The insufflation set :-

For insufflation of the peritoneal cavity, a special needle
s in-troduced through the abdominal wall, then the selected gas is
mped in through a flexible tubes. Most insufflators utelize a

everal needles are availabe for insufflation, for example, the
arres needle, touhey needle, a plastic Rochester catheter and the
pinal needle. The Verres needle is the most commenly used, while
he spinal, being long, is reserved for the obese patients
he Verres needle consists of a blunt canual surrounded by a sharp
uter one. There is a spring that pushes the inner canual beyound
he outer one as the latter pierces the tough abdominal fascia.
t protects the visera against injury. The internal diameter of the
eedle should not exceed 16 gauge to prevent too rapid insufflation.
Cali, 1980).

The insufflator consists of three parts, the regulator,the
ressure gauge and the flow ball. The regulator controls the
ow of the gas at a rate of one litre per minute. A meter to
easure the volume of insufflated gas guards againts overinsuff-
ation. The pressure gauge indicates actual pressure within the
eritoneum. The flow ball indicates patency of the system.

A pyramidal - tipped trocar with a valve is used to prevent gas leakage. Such a valve is of two types , The trumpet type which is manual and more popular which is used to remove large resected specimens,and the automatic flap types. Most trocar sleeves are made of fiberglass to reduce electrical conductivity, others are made of metal which are used only when electrocoagulation source is of low voltage and high ampere type . Recently metal sleeves are totaly insulated.

The light source and the cables:

Some manufacturers integrate the fiber bundles of the telescope and cord. the standard light bulb produced 150 watts. Special 1000 watts bulbs and xenon light sources project more intense light, which is required when cinematography is performed and teaching sidearms are used.

The Auxiliary instruments:

Secondary trocars and their sleeves are available, with or without valves, in six and four mm . Sizes. The pyramidal tip is recommended.

Auxiliary instruments include a blunt probe for palpating or displacing viscera, a grasping forceps, an electrified

Scissors, a biopy forceps and a suction probe. Unipolar electro-surgical instruments should always be available or bipolar with low voltage current.

Endoscopes are devices for visualization of the interior
dy cavities. Direct view endoscopes, like the speculm has no
tical elements interposed between the tissue and the viewer.
e angle of view is limited by the ratio of the luminal diam-
er to the length of the scope. Indirect view endoscopes, as
e laparoscope ,were developed to widen the view angle i.e. the
eld. This was achieved by interposition of optical elements to
ansfer the image. In the past, indirect view endoscopes had an
jective lens to form the image at the distal end, and an ocular
e to see the image at the proximal end. In between, a group of
nses transferred the image as a whole, with some correction of
e optical distortion.

Scopes may have a direct viewing end with ar arc of view of
degrees, or a foreoblique end with an arc of view of 135 degrees.
The later enables one to look out forwards and obliquely with
wider field of vision.

Present-day commercial endoscopes suffer from attenuation of
ansmitted light; it was estimated that 20-50% of the projected
ght energy is lost during transmission through a two meters long
tic fiber . Another peculiar character about optic fibers is that
ey are selective as different wave lengths are concerned ; they
vour the red zone of the spectrum more than the blue . Lens rel-
endoscopes are thus more faithful than fiberoptic ones , since the
rmer reproduce the entire spectrum , giving sharper and a higher
age (Quint , 1977) .

Anaesthesia :-

Laparoscopy requires the utmost cooperation between the surgeon and anaesthetist; it entails the use of gas to creat pneumoperitoneum, and the anaesthetist should be aware of the consequences of gas absorption. Anaesthesia should provide amnesia, adequate analgesia and relaxation. The anaesthetic technique should allow rapid recovery. The procedure is frequently conducted on an outpatient basis. The complications of anaesthesia include cardiac arrhythmias, gas embolism , pneumothorax, pneumo-mediastinum, hypotension, hypertension, hypercarbia , hypoxia, gastro-intestinal injuries and electrieal accidents.

Any of the anaesthetic techniques available may be employed in a laparoscopic procedure. Thus, general anaesthesia, regional anaesthesia or local analgesia may be used. The superiority of one modality over the others has not yet been established. It is preferrable to use general anaesthesia when the patient is anxious, the surgeon is less experienced. Patients who have sever cardiac or pulmonary diseases are submitted to regional or local anaesthesia.

Regional anaesthesia is contraindicated in the presence

volaemia, History of neurologic disorders or allergic reactions to local anaesthetic drugs. Like general anaesthesia , it is not suitable for patients with pulmonary diseases because the block may be so high to intrrupt respiration. To perferm regional anaesthesia,one should master the epidural technique. In non operating room settings, the surgeon is left with local analgesia to use, however resuscitation equipments should be available for use. Local analgesia is contra-indicated when there is intraperitoneal adhesions and when an operative procedure is to be performed through the laparoscope .

Technique.

Starting to do laparoscopy, the operator should confine to diagnostic objectives and straight forward cases untill he devlops sufficient experience to carry out operative procedures. The procedure should be conducted in a well equipped theatre, facilities for laparotmy should be available as laparescopic findings may indicate urgent or elective laparotomy or complications.

The patient should be suitably positioned. A return electrode should be placed beneath the patient's buttocks wheather or not the planned procedure entails the use of diathermy The abdomen is then cleaned with an acceptable solution as iodine solution. The preparation is carried out from the costal margins downwards to the th_ighs and between the midaxillary lines. Cotton swabs may be needed to clean the umbilicus in patients with poor hygiene. Draping then fellows, using single or multiple drapes, made of linen or paper plastic . A small laparotomy sheet with a central hole, large enough to expose the umbilical area, is convenient.