

**PAST, PRESENT AND FUTURE OF LAPAROSCOPIC SURGERY**

Laparoscopic Surgery has revolutionized the surgical arena and brought the greatest changes in the technical practice of surgery. It has evolved as a part of general surgery with the introduction of laparoscopic cholecystectomy and very soon found its place in the surgical practice, mostly due to its great patient demand, which the surgeons could not deny. The benefits conferred to patients by less invasive procedures, minimum scar, decreased pain, shorter hospital stay and shorter recovery all took this technology to a new height. Loss of work became less and most of all fear of surgery diminished substantially.

Such a revolution was not without a history. Dr. Carl Johan August Langenbuch, a German surgeon performed the first Cholecystectomy on 15<sup>th</sup> June 1882 on a 42-year-old man and almost one hundred years later in 1987 a French gynecologist Dr. Philip Mouret performed the first laparoscopic Cholecystectomy.

An Arab physician Abul Kasi (936-1013 A.D.) first used a reflected light to examine the cervix, which was the first attempt to examine an internal organ<sup>1</sup>. Bozzani of Frankfurt in 1805 reported an attempt to visualize the urethra and bladder with a crude instrument called 'Licht Leiter' using a candle as a light source. Segal in 1826 developed a urethroscope. In 1867, Andrews introduced the idea of a burning Magnesium wire in a kerosene flame to provide better light and after Edison invented electric light in 1880, it was used as a light source. In 1901, Ott, a famous Petrograd gynaecologist introduced the idea of examining the abdomen through a small incision, which he called ventroscopy<sup>2</sup>. Kelling, a surgeon from Dresden examined a living dog's abdomen with cystoscope and called it clioscopy<sup>3</sup>.

In 1910 Jacobaeus of Stockholm first used the word Laparoscopy where pneumoperitonium was done with air and in 1942 he reported 115 laparoscopic examinations used primarily to diagnose cirrhosis, metastatic cancer or tuberculosis<sup>4</sup>. Zolli Kofler from Switzerland in 1924 introduced the use of CO<sub>2</sub> for insufflation<sup>5</sup>. Kalk developed a new system of lens in 1929 and Professor Horold H. Hopkins of University of Reading in 1976 developed the rod lens system<sup>6</sup>. In 1950 Geotze and Veress developed insufflation needle, which is popularly known as Veress needle. The most

important technological improvement necessary was the camera, and in 1980 a small colour, high-resolution camera became available to adapt a laparoscope.

Since Dr. Philip Mouret of Lyon France did the first Laparoscopic Cholecystectomy, this new technology has advanced very rapidly. Both the surgeons and the patients took serious interest in this new kind of surgical approach. Industry started presenting new equipments almost every day. Soon appendicectomy, inguinal hernia repair, fundoplication for reflux oesophagitis, and splenectomy became routine procedure in the developed world. Now resection of colon surgery, rectopaxy for rectal prolapse, partial and total gastrectomy, pancreatic tumor surgery, pseudopancreatic cyst operation and even a Whipple's procedure can be done using this new technology. Adrenalectomy both by trans abdominal and retroperitoneal approach is done routinely in many centers.

In the acute abdominal conditions laparoscopic surgery has proved to be very useful. Perforation of the duodenal ulcer, acute appendicitis, acute cholecystitis, intestinal obstruction, gynecological emergencies like twisted ovarian cyst, ruptured ectopic pregnancy etc, has seen the successful use of Laparoscopic technique. Orthopaedic surgeons have used this to do spinal surgery. In many centres urologists are routinely using this to remove stones from the kidney pelvis. Even in kidney transplant, the donor kidney is being removed laparoscopically. Developments in creating artificial space around the target organ have helped surgeons to approach the thyroid, parathyroid, and the breast. Retroperitoneal adrenalectomy, and extraperitoneal hernia repair have found place in routine operating lists in many centers. Cardiac surgeons are doing bypass procedures and also using robotic arms to achieve perfection in the procedure.

Development of new equipments have helped the surgeons to achieve this in such a short time. Among the new equipments, one of the most useful and popular one is the Harmonic scalpel, which helps to coagulate tissue and divide it without producing lateral heat and as a result does not damage the surrounding tissue. For most of the advanced laparoscopic procedures it is a very useful tool. There are newer diathermy

equipments, robotic arms to minimize number of assistants, newer camera systems with 3D vision, head hold LCD screen and voice operated computers to adjust different settings during surgery. Natural orifice transluminal endoscopic surgery (NOTES), is the most recent adventure of surgery, which is still in its infancy. There are reports of some experimental transgastric and transvaginal cholecystectomy and appendectomy done in few centers.

Bangladesh did not stay back to accept and start this new technology. In 1991 for the first time in Bangladesh a Japanese Surgeon, Prof Hashimoto demonstrated this technique at BIRDEM hospital and then since early 1993 we started laparoscopic surgery on a regular basis in the country. Very rapidly a good number of surgeons got trained and the procedure spread throughout the country both in government and private sectors. At BIRDEM apart from cholecystectomy we have performed laparoscopic procedures in appendectomy, vagotomy, gastrojejunostomy, hemicolectomy fundoplication, choledocholithotomy, splenectomy, abdomino-perineal resection of rectum, hernioplasty for both inguinal and incisional hernia, repair of chronic duodenal ulcer perforation, drainage of liver abscess, thoracic sympathectomy, adrenalectomy, thyroidectomy etc. Most of the advanced procedures that are now done laparoscopically around the world are being conducted at BIRDEM hospital. Other surgeons interested in laparoscopic surgery in the country are also doing lots of advanced procedures.

With a new approach to a standard operation, many of the principles of surgery need to be reemphasized and new areas of technology need to be learnt. Training of the young doctors and trained general surgeons need attention of the surgical societies. Credentialing of the surgeons demands serious thoughts for near future; basic principles in selecting the criteria may include trained general surgeons capable of managing complications of open surgery, attending hands on workshops and experience in supervised and proctored performance of laparoscopic surgery.

Surgery of the future will be increasingly fast, increasingly safe and increasingly cheap. Voice controlled robots now can perform many procedures. These are improvements on natural human precision, stamina, speed and calmness. Intercontinental

telesurgery has passed the test of science in 1998. Laparoscopic cholecystectomy was done on a patient in USA by a surgeon from Singapore by using satellite communication and robot. Next generation robots will communicate tactile information to the surgeons. In a number of centers robots are being used to do laparoscopic surgery routinely.

The application of laparoscopy in current surgical practice is undergoing constant changes and rapid developments. These developments have to be weighed against over-enthusiasm and the problems created by a lack of familiarity with new techniques and instruments. Proper training and exposure to this technology is must to avoid complications. Active interest and innovation could make this patient friendly surgical technique revolutionize the whole surgical arena of the present world, both for the poor and the rich. The growth of science and technology suggests that the techniques our future surgeons will use to perform surgical procedures is now beyond our imagination. So we have no time left to catch-up with the present and prepare for the future.

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