

Leading Article

Delivering a modern surgical service from minimal access surgery to scarless surgery: Is this a requirement of our era?

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It has been suggested that medicine will change more in the next 20 years than it has been in the past 2000 years. This may be true as a result of advances in biotechnology and the recent emergence of nanotechnology (deals with the manipulation and control of nanomaterials with at least one dimension below 100 nm).¹ These particles have been incorporated successfully into modern surgical practice offering minimally invasive surgical techniques including robotic surgery especially in cardiovascular system.

As such history of surgery dates back as far as the human history of civilization is known. Archaeologists have found evidence of surgery in the form of trephining (making holes in the skull) since long ago 10000 B.C back. Since then surgeons have been trying to reduce the pain and the trauma associated with surgery by development of surgical skills. Initially progress (1846) was made by putting patient on ether and doing amputation of the limb within 30 seconds time to reduce period of pain.²

Surgical technique and anesthesia advancement technology both went on developing to obtain less trauma and less pain to the patient to visualize the surgical field safely. The concept of bigger the incision better the surgeon was practically popular till last period of 20th century.

When minimally invasive techniques have changed its face for ever.

It was 1st the German gynecologist Conred Lagenback who 1st performed minimally invasive procedure a vaginal hysterectomy in 1813. First general surgical procedure performed was Laparoscopic appendectomy by a gynaecologist moving from traditional open surgery to minimally invasive surgery by using multiple small incisions. But one of the most revolutionary step taken was performing cholecystectomy Laparoscopically initially described by Erich Munhe in 1985.³ First video assisted cholecystectomy was performed by Phillip Mouret in 1987 in Lyon France. Since then multiple port laparoscopic surgery has developed to enable a range of procedure and remains in widespread use for multiple procedures starting from appendectomy to deliver big masses like adrenal tumours. To facilitate more of Laparoscopic process, hand assisted and hand accessed procedures are also adopted to overcome the difficulty of delivering specimen and to access three dimensional assessment and have a manual feeling of structures respectively.⁴

As laproscopic techniques evolved, surgical robots were also developed to facilitate complex procedures by solving the problems of visualization and instrument manipulation. The perceived benefits of these robotic devices are three dimensional vision, better operator comfort, ease of instrument manipulation and better access to the operating area but still it's practical work is limited because of cost of instrument and expertise for usage.⁵

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Surgeons quest for better techniques and for good outcome has explored an other scarless technique of surgery called Natural orifice Transluminal endoscopic surgery (NOTES) and single port incision Laparoscopic surgery (SPILS). Concept of performing surgery via natural orifice achieves the goal of calling totally scarless surgery.⁶

Natural orifice surgery uses external orifices for introduction of instruments but also can use the port by perforating hollow viscus (stomach, vagina etc) to reach the target organ by entering into the abdominal cavity and then again finding exit of also delivering the specimen.

Birth of modern NOTES using flexible instruments was 1st carried out by Kalloo and Colleagues in 2004 by using transgastric laparoscopy proving it to be more feasible in animal models. After success of the procedure in animal models it was applied in humans for appendectomy and cholecystectomy. Although claims of getting scarless surgery' low trauma and less pain with improved recovery are there but still it requires more confirmation to come on merit before it's wide spread applications. As several demerits are also associated with the procedure like access and orientation in the abdomen, secure closure of opening of a viscera associated infection and also required training are the big difficulties. Because of these above concerns, the recent interest in SPILS has increased over the novel concept of NOTES which is now considered by surgeons as more acceptable procedure for themselves as well as for patients.⁷

The first single port incision laparoscopic procedure was performed in 1960s again by gynecologist for performing sterilization.

First SPILS appendectomy was performed by again gynecologist in 1992. In 1997 1st SPILS cholecystectomy was performed by surgeons this time.⁸

Proponents of SPILS claim that single port laparoscopic procedure achieves all the potential benefits of NOTES while eliminating the risk of infection and perforation of viscous deliberately made. Trans umbilical incision used for SPILS procedure conceals the scar and so gives virtually a scarless surgery. umbilical access also provides of a view of peritoneal cavity familiar to surgeons experienced in traditional laparoscopic work thus reducing the problems of orientation as in the NOTES. Close placement of instruments in SPILS has disadvantages of suboptimal view and clashing of instruments which can be overcome by better optics and instruments.

But in spite of these disadvantages SPILS technique is picking up high level of interest in surgeons as compared to NOTES. At present SPILS continue to advance by developing new procedures and new innovative techniques. Considering above facts the future of surgery is getting deeper with minimal access surgery to reduce the pain and scarring for the betterment of the patients. Even complex surgical procedures now are performed by this technique but aim should be to perform it safely and effectively.⁹

Future of minimal surgery looks to be bright with continued desire to reduce the pain and scarring as emphasis is to how to use this technology to achieve above goals by using of aim to do less and achieve more as far as the results are similar if not better.

In Pakistan this technology is in developing phase as in most of the district or even tertiary care hospitals still we are surviving at primitive stage of doing laparoscopic cholecystectomy, appendectomy or maximally Herniotomy. For wide spread use, new setup should be framed, model training centers should be opened. Young surgeons should be trained through workshops.

Public sector also should be aware about its responsibilities, to facilitate this technology and especially in teaching hospitals it should be introduced through a new head. It can become also popular in our country as traditional surgery carries several complications of wound like hernia, hypertrophy, sinus discharges, cosmetic look and several more.

Popularity of this technology in this part of the world will depend upon how much this surgery will be safe and gain the confidence of public, sound training and good set up of theaters will help.

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