Pediatric laparoscopy - past, present and future

“Nothing endures but change” - Heraclitus

Thanks to innovative technology and equally adept pediatric surgeons laparoscopy in pediatric surgical practice has become a reality.

Initially there was reluctance on the part of pediatric surgeons to undertake laparoscopic procedures in spite of the same being well established in adults. Perhaps, the reason being that many of our pediatric surgical colleagues who were well established in the art of open surgery were afraid of the long learning curve of the new technology and reluctant to apply to new born babies and children. Of course, lack of proper instruments, bulky equipment, insufficient experience of pediatric laparoscopic anaesthesiologists also added to the hesitancy. However one must commend the perseverance of a select group of pioneering pediatric surgeons to pursue the new technology to its ultimate goal.

Initially, Laparoscopy was used mainly for diagnostic purposes like UDT, intersex, repositioning of VP shunt tubes. Given the window to the abdomen it fired the imagination of the pioneering surgeons to rapidly upgrade themselves in specialized laparoscopic skills. Innovative approaches were created to overcome the problems of creation of space, eye to hand co-ordination, trocar placement, depth perception tissue handling, energy devices, knotting and suturing. Each procedure completed gave the pediatric surgeon the impetus to explore newer laparoscopic options. Having successfully mastered the technique of diagnostic laparoscopy excisional procedures like appendix, gall bladder, spleen were next on the list.

Simultaneously, there was distinct improvement in instrumentation, digital videoscopy, harmonic scalpel enabling surgeons to explore newer possibilities like thoracoscopy, repair of diaphragmatic hernia, vascular ring etc. Once the pediatric surgeons reached the level of intra corporeal suturing reparative procedures were handled with ease and comfort. Sky became the limit. Stapling instruments facilitated faster intra corporeal procedures. Repair of Tracheo-Oesaphageal fistula, Hydronephrosis Duodenal Obstruction were undertaken with excellent results.

All these developments came at the appropriate time to take pediatric laparoscopic surgery to the next higher level. It directly translated into minimizing scars, minimal pain, shorter stay in the hospital. It is imperative that the present day pediatric surgeon be fully acquainted with this new approach or the market forces will take the enlightened parents away to an MIS (Minimal Invasive Surgery) centre with expertise.

“We are made wise not by recollection of our past but for our responsibility for our future” - George Bernard Shaw

Technologies are revolutionizing the approach to all fields of science especially in medicine, they have improved delivery systems of drugs, created new molecules and sophisticated instruments to reach previously inaccessible portions of the body safely. As surgeons it is our duty to foresee the future using available technology so that we become innovators of procedures rather than mere copy cats.

“Past cannot be changed, the future is still in your power” - Hugh White

Telemedicine the new mantra along with faster pace of communication and image transfer technology have opened the doors to the spread of medical knowledge. Using digital communications and fibre optic lines one can transfer images to an centre of excellence for an appropriate feedback on the best management practices without shifting the patient or the surgeon.

Virtual Reality is a computer generated technology, create simulated life like environment. 3-D images seen on the screen actually bleed when cut, deform on pressure. VR opens up new vistas in education, training and planning surgical procedure.

Advances in 3-D imaging have added a new dimension to the safety of Laparoscopic surgery. It literally recreates human vision by throwing images on two different monitors facilitating depth perception. Visual comfort so achieved translates into faster and accurate hand movements especially involving intricate procedures. Head up display as worn by high altitude pilots enhances visual
facility decreases fatigue and improves quality of surgical procedures.

Robotics and computer assisted systems have added a new dimension in the field of laparoscopic surgery. It facilitates complex surgical procedures to be performed by a surgeon sitting in a chair adjacent to an operative suite either in the same hospital or across the globe. Stress levels are reduced to the minimum. Accuracy is achieved without sacrifice of safety. Although in the present context it is exhorbitantly expensive it overcomes the problem of learning curve, as one expert can sit in a centre of excellence and conduct surgeries across the world. It enables wartime injuries to be handled expertly, where there is lack of specialists in the battlefield and future applications for patients in international space stations. Robotics is here to stay and will replace endoscopic and open surgery shortly.

“Innovation replaces tradition. The present or perhaps the future replaces the past. Nothing matters so much as what will come next and what will come next can only arrive if what is here now gets overturned”

- Schumpeter - Grove

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