Minimally Invasive Surgery Week

MINIMALLY INVASIVE SURGERY WEEK 2013
ANNUAL MEETING & ENDO EXPO
HYATT REGENCY RESTON
RESTON, VA (WASHINGTON DC)

NESA BREAKOUT SESSION

In order of presentation

Friday 7:30am-12:00pm

NOS Introduction in the Middle East: First Results with the Transvaginal Access

Tahar Benhidjeb, MD, PhD

Laparoscopic surgery achieved high standards during the 20th Century by reducing morbidity and pain intensity, improving recovery and shortening hospital stay. Whereas laparoscopic procedures are less invasive than open surgery, they still require several incisions for transmuscular/parietal port placements and incision enlargement for specimen extraction. In order to avoid abdominal incisions, the realization of surgical procedures by using natural openings as an entry to the abdomen has been introduced. This Natural Orifice Surgery would result in less invasiveness by eliminating skin incisions and their potential by-products and complications, such as postoperative somatic abdominal wall pain, wound infection, and hernia. Actually, the transvaginal approach is the common route used for NOS applications in humans. It does not necessitate any sophisticated devices for opening and closure of the posterior colpotomy, thus being easy for the surgeon and safe for the patient. We report on our experience with the first 20 patients (status 04/2013) in the Middle East who underwent transvaginal cholecystectomy (n=17) and appendectomy (n=3).

Complications in Endoscopy – Prevention, Recognition and Management

Ceana Nezhat, MD

Smart Surgeons Learn from their Mistakes, Brilliant Surgeons Learn from Others

Despite the degree of caution, amount of preparation, and skill, complications occur during operative laparoscopy. Because sequelae can result from even relatively easy procedures, a surgeon must be able to recognize them promptly and manage them properly. The risks increase with the complexity of the procedures, the relative inexperience of the surgeon, and the amount of deviation from standard technique. As laparoscopic procedures become more complex, the ability to handle them endoscopically becomes important.

We will review prevention, recognition, and management of injuries that occur during pelvic laparoscopy, in addition to principles and techniques for safe abdominal entry.

Synchronous Arterial and Venous Blood Gas Changes During Pneumoperitoneum – Experimental Model

Ospan Mynbaev, MD, PhD, ScD, MSc

In this presentation an original concept concerning blood gas changes during CO2-pneumoperitoneum will be presented. Blood gas, acid base balance, blood oximetry and oxygen status changes in patients during laparoscopic procedures were

created in a rabbit model. Differences between arterial and venous blood gas changes were studied during CO2-pneumoperitoneum with gradually increased intraperitoneal pressure (IPP: 0-5-10-15 mmHg) and after desufflation. Current findings were supplemented with previous results and literature review. It was shown that an increased IPP from baseline till 15 mmHg is accompanied with gradually raised both venous and arterial pCO2 with sharp decline after desufflation. Both arterial and venous pH also gradually and dramatically decreased during CO2-pneumoperitoneum from baseline till 15 mmHg and recovered after desufflation up to baseline level. Acid base balance, blood oxygen and oximetry parameters were also synchronously disturbed. Changes in venous blood values were more severe than in arterial blood. These findings concerning differences in blood gas, oxygen status and acid base balance changes between arterial and venous blood during CO2-pneumoperitoneum allowed to gain us insights into additional pathways of CO2 distribution and mechanisms of changes induced by the increased amount of CO2 concentration in blood stream. So, according to our concept the mechanism of changes during CO2-pneumoperitoneum can be explained by CO2 saturation of both parietal and visceral peritoneum tissue. Then CO2 passes through the peritoneum and blood stream with subsequent elimination through the lungs. Highly accumulated CO2 in the blood stream with was probably a result of reaching the upper limit of tissue CO2 saturation at this level of IPP, which was accompanied by a critical decrease in venous pH value. An increased tissue-to-venous and venous-to-arterial CO2 tension gap is the driving mechanism of CO2-pneumoperitoneum-induced local peritoneal and systemic changes during laparoscopic surgery, which is strictly associated with IPP.

A Novel Surgical Sealing System

Doron Kopelman, Prof Dr Med

The innovation is the combination of gelatin & the enzyme. The calcium-independent microbial Transglutaminase creates Cross-Linked Gelatin. The material characteristics are: It is biocompatible and biodegradable, it has strong adherence even to wet tissues, it is made of non-human components, and due to the stable components it has extended shelf life. It has triple function: sealing, homeostasis & fixating of foreign materials to tissue. This novel sealant is indicated for use as an adjunct to soft tissue anastomosis with staple/suture line during open or laparoscopic GI surgery including lower rectal & bariatric procedures.

- In-vivo stability allows physiological healing and regeneration of wound site
- Flexibility and tissue adherence is retained over a period of several weeks In-vivo
- Optimized curing speed facilitates convenient application and sealant placement

Pre-clinical and preliminary clinical studies will be presented.

Key Note Lecture: NOS – State of the Art

Tahar Benhidjeb, MD, PhD

The concept of Natural Orifice Surgery (NOS) has grown in acceptance since its introduction 10 years ago. A multidisciplinary cooperation led to the development of innovative solutions to overcome skin incisions and their potential complications. In the meantime transvaginal and transgastric cholecystectomies and appendectomies are being performed successfully and routinely in some Hospitals in Europe, Latin America and the United States. We will report on the latest results in this field.

Minimally Invasive Breast Biopsy

George Zografos, MD

Minimally invasive biopsy is the standard of care for the evaluation of suspicious non-palpable breast lesions. The Breast

Lesion Excision System (BLES) is a new method introduced for these kinds of procedures. It utilizes radiofrequency (RF) in order to perform a one-pass intact specimen excision of the suspicious lesion. Briefly, a tissue basket is deployed circumferentially to the targeted lesion, while the RF energy is applied in order to cut and achieve hemostasis.

From April 2010 to March 2013, 910 patients (mean age=53.3, range 33–82) underwent a biopsy with BLES in the Breast Unit of the Hippocratio University Hospital of Athens, Greece. Biopsies were performed for assessment of suspicious micro calcifications, solid lesions or asymmetric densities, classified as BIRADS≥4. Moreover, patients with BIRADS 3 lesions and significant family history of breast cancer were offered breast biopsy with BLES. In order to retrieve an intact biopsy specimen, we used the 12mm, 15mm or 20mm tissue basket depending on the size of the lesion, under local anesthesia.

According to our experience, the BLES device is an efficient and safe breast biopsy method, with low complication rates. It appears to be a very promising alternative to other, minimally invasive, breast biopsy techniques

Gynecological Oncology: Comparison between Endoscopy and Computer Enhanced Tele-Surgery

Farr Nezhat, MD, FACOG, FACS

The traditional surgical management in gynecologic oncology cases has typically included included exploratory laparotomy through a midline vertical skin incision, peritoneal washing, total abdominal hysterectomy, bilateral salpingo-oophorectomy, with or without pelvic and paraaortic lymphadenectomy and omentectomy. More recently, however a minimally invasive approach is being employed. The introduction of video-assisted laparoscopy revolutionized modern day endoscopic surgery and offers benefits such as decreased blood loss, fewer complications, shorter hospital stay, more rapid return of bowel function, improved pain control, favorable cosmetic results, quicker return to baseline function, and comparable disease-free survival. The advent of computer enhancedtele-surgery called robotic surgery adds benefits of improved visualization, surgical dexterity, and physician comfort. However, important limitations of robotic surgery exist including the added operative time and cost associated with the robotic procedure. Various studies show conflicting results and the skill of the surgeon needs to be taken into consideration. Conversion and complication rates have been shown to be comparable between conventional laparoscopy and robotic surgery. With ongoing exposure by the media and the dissemination of information, patient preference will further encourage a movement toward minimally invasive surgery, be it conventional laparoscopy or robotic-assisted laparoscopy and both have their role in the management of gynecologic malignancies.

The Usage of Bipolar Sealing System for Cystic Duct Closure

Svend Schulze, MD

Cystic duct leakage after cholecystectomy is not uncommon and it is a potentially serious complication. We have earlier evaluated a bipolar sealing system for cystic duct closure in an animal study. The aim of our study was to assess bipolar sealing for closure of the cystic duct in humans.

The records from consecutive laparoscopic cholecystectomies with closure of the cystic duct with bipolar sealing after informed consent were recorded and complications and morbidity registered. The records were compared with those of patients undergoing laparoscopic cholecystectomy with closure of the cystic duct with clips during the same period.

During the one year study period, 218 laparoscopic cholecystectomies were performed; 102 of these were performed with the bipolar sealing system. One patient was excluded due to violation of the protocol. We experienced no cases of cystic duct leakage, but in one patient bile leakage from the gallbladder bed was observed probably due to a small aberrant duct.

We found bipolar sealing to be safe and effective for closure and division of the cystic duct in laparoscopic cholecystectomy.

Preparing Future Doctors: A New Kind of Medical School, Inspired by NESA

Hilliard Jason, MD, EdD

In 2009, following Michael Stark's initiative, a group of NESA members began thinking about the need for a new kind of medical school. In the following year I was invited to join this adventure. A lot has happened since then.

Why do we need another medical school at this time? Why a new kind of medical school? In this presentation I will strive to answer these and other questions.

We've embraced 3 foundation principles for this new medical school. As fully as possible, we are committed to: 1) responding to the findings of educational and brain science; 2) preparing doctors who are equipped for whatever the future brings, and 3) pursuing scholarship that studies and continuously refines our understandings of the processes of medical education.

What will be needed 25 years from now, when new medical students will be at the height of their careers? We can't know for sure, but, given the rapid changes happening in medicine, and in society's expectations, we know we will need doctors who are equipped with the learning skills, curiosity, and capacity for reflection needed for adopting new developments in medicine, and for adapting to population and other changes, as needed.

To prepare our students and their educators, our educational process will be analogous to the clinical-care process, as follows:

1. "*Diagnostic workup*": We will gather thorough information from and about all promising applicants: their characteristics, strengths, interests, goals, communication styles, and more.

2. "*Management plan*": Each learner's pathway and pace through the curriculum will be highly individualized (learners' needs are even more diverse than those of patients).

3. "*Progress monitoring*": Each learner's experiences and accomplishments will be continually monitored, so program modifications can be made promptly, as needed.

4. "*Admission and discharge*": We will accept new candidates throughout the year (they won't move through the program in unison with classmates); and students will graduate (be "discharged") when they've achieved the outcomes we (and regulators) expect.

5. And quite a bit more.

In this presentation I'll explain how we'll prepare those who will serve as educators for this continuously adaptable, individualized program, how we'll exploit modern technology to prepare tomorrow's doctors appropriately, and how we'll study these activities to refine our understandings of the teaching-learning process in medicine.

When Will Minimally Invasive Surgery Replace Almost All Laparotomies?

Camran Nezhat, MD

A brief history of surgery and historical barriers, including resistance to the adoption of new technologies, will be discussed. Drawing from these historical vignettes, we will illustrate just how crucial it is to continue engaging in further research and innovation so that the discipline of surgery can reach its full potential, a moment we believe is over the horizon, when minimally invasive surgery will replace almost all laparotomies.

The Transdouglas Surgical Approach: "Less is more" – The Future

Daniel A. Tsin, MD

Culdolaparoscopy is a transvaginal NOTES (pure), also known in its hybrid form as Minilaparoscopy Assisted Natural Orifice Surgery (MANOS) that combines operative culdoscopy with minilaparoscopy (www.culdoscopy.com). A culdolaparoscopy preliminary report was published in the JSLS in 2001. MANOS presenting 100 cases of human experience including appendectomy and cholecystectomy were published in the JSLS January - March 2007 issue. Since then, working with a team of surgeons, we evolved to different levels of the transdouglas approach of cholecystectomies. We achieved 4 levels of advancement in culdolaparoscopy.

Level 1: (hybrid) Uses the original description of culdolaparoscopy that consists of the use of a long transvaginal laparoscope with minilaparoscopy assistance. We gradually replaced some minilaparoscopy ports with percutaneous needle assistance.

Level 2: (hybrid) For this level we combined a transvaginal gastroscope with rigid instruments.

Level 3: (pure) We used the assistance of magnets, secured independent tools (laparoscopy tramway) or percutaneous needle using a vaginal gastroscope or laparoscope for visualization.

Level 4: (pure) Uses a transvaginal operative laparoscope, with percutaneous needle assistance.

Transdouglas hybrid cholecystectomy is at this time the best viable, affordable and safe clinical application for the NOTES approach to the gallbladder. The future is here, some investigators are experimenting with advanced flexible technology. Other types of research are focusing on micro robotics and the use of miniature tools. We are improving the use of magnets, percutaneous needles and secured independent tools in NOTES and in one port Laparoscopic Surgery (1PLS).

Initial Experience with a Synthetic Adhesion Barrier on Fertility & Pelvic Pain Patients Using Second Look Laparoscopies in the Fertility Patient roup

B.J. van Herendael* , B. Tas*, M. Francx, B. De Vree**,**

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Background: The incidence of adhesions after intra-abdominal surgery varies around 85%. It was common belief that laparoscopic surgery does reduce the number of postoperative adhesions. There is only evidence for the de novo adhesions. The adhesion reformation after laparoscopic adhesiolysis does not differ from the adhesiolysis by laparotomy. The use of adhesion barriers is therefore indicated in gynaecological laparoscopic surgery.

Methods: A first group of thirteen patients participated in a prospective randomized trial. A first look operative laparoscopy (FLL) was followed by a second look laparoscopy (SLL) five to eight weeks after the FLL. A second group of eleven patients had previous laparoscopic surgery and the operative laparoscopy was considered the SLL. The effect of the synthetic adhesion barrier was assessed at SLL and compared with matched patients who did not receive the adhesion barrier.

Results: Of the thirteen patients in the first group eight received the barrier and five patients were in the control group were no barrier was given. After correction five patients with myomectomy and tubal anastomosis were matched with four controls. None of the treated patients had de novo adhesions at SLL versus 75% in the control group. In the endometriosis group there was a reduction of adhesions by 61% at SLL compared with FLL. In the group of previously operated patients the AFS score was 32 and the average time to lyse the adhesions was 63 minutes.

Conclusion: The use of a synthetic site specific adhesion barrier did reduce the formation of de novo adhesions in the patients treated with the barrier during gynaecological surgery as compared to the non treated group. At SLL in endometriosis patients there was a marked reduction of the adhesions scored with AFS.

An Evidence-Based Optimal Cesarean Section

Michael Stark, MD

Many surgical procedures are based on traditions rather than on evidence based facts. As surgical steps do influence the operative outcome we started to re-evaluate the necessity and way of performance of each surgical step in Caesarean Section, which is one of the most frequent performed operations, and compared them with the outcome.

The modified Joel-Cohen method, based on time and motion studies resulted in a shorter incision to delivery time, lower rate of febrile morbidity when compared to the traditional Pfannenstiel incision.

Opening the peritoneum by using bi-digital stretching rather than sharp instruments proved to be safer, and exteriorization of the uterus makes stitching easier and as the uterus can be contracted manually avoids unnecessary bleeding. Suturing the uterus with one layer results in stronger scars and reduced pain.

Leaving both peritoneum layers open prevents adhesions and results in reduced need for analgesics.

The fascia being sutured continuously with first knot underneath the fascia prevents irritation in the sub-cutis, and, by a right-handed surgeon, suturing the fascia from the right to the left, proved to be ergonomically optimal.

Since the introduction of this modified and simplified method, it has been evaluated by dozens of peer-reviewed publications from different countries. Without exception, all showed various advantages of this method: shorter operation time, shorter hospitalization, quicker mobilization, less blood loss, lower rate of febrile morbidity, lower costs, and less need for painkillers, which enables the mothers to look after the new-born soon after the birth and makes the follow-up as similar as possible to natural childbirth. These studies will be presented.

Only 10 instruments and three sutures are needed, which also simplifies the workload of the nurses.

The principles of this operation can be used in every surgical discipline and it is recommended as a universal routine method.

The Introduction of the Misgav Ladach Cesarean Section in the United States

Prof. Amos Grunebaum

The Misgav Ladach method for Cesarean section is named after a hospital in Jerusalem. It is now being used in medical centers around the world and eliminates many conventional steps, resulting in a quicker birth, less trauma for the mother and more rapid recovery.

The original methods is as follows, though there are many modifications reported:

The skin incision is a straight transverse incision somewhat higher than the Pfannenstiel incision. The subcutaneous tissue is left undisturbed apart from the midline. The rectus sheath is separated along its fibers. The rectus muscles are separated by pulling. The peritoneum is opened by stretching with index fingers. The uterus is opened with an index finger and the hole enlarged between the index finger of one hand and the thumb on the other. The uterus is closed with a one-layer continuous locking stitch. The visceral and parietal peritoneal layers are left open. The rectus muscle is not stitched. The rectus sheath is stitched with a continuous non-locking stitch. The skin is closed with two or three mattress sutures. The space in between is apposed with non-traumatic forceps for 5 minutes.

A Cochrane review in 2007 for abdominal surgical incisions of cesarean section showed that the Joel Cohen technique has advantages over the traditional Pfannenstiel incision, less pain, fever, and analgesic requirements. Less blood loss and shorter duration of surgery and hospital stay

A recent review in the American Journal of Obstetrics and Gynecology of cesarean section techniques showed that compared to tradition methods, Misgav-Ladach was associated with reduced blood loss, operating time, time to mobilization, and length of postoperative stay for the mother.

The Misgav Ladach method of cesarean section is among the most researched methods for cesarean sections, with a Pubmed search on April 5, 2013 showing 75 references to the Misgav Ladach method. The vast majority of the publications come from countries outside the United States where it has not received wide-spread acceptance yet.

At the Weill Cornell Medical Center in New York we have introduced the Misgav Ladach method to our residents about 12 years ago, however wide acceptance is difficult because most Ob Gyn attendings have not been trained extensively in this method and continue to use the traditional Pfannenstiel method.

The Implementation of the Misgav Ladach Method in Turkey

Oktay Kadayifci, MD

Victor GOMEL said: “In an ideal world illness would never occur, or if it did, it would be amenable to diagnosis and cure by noninvasive means. Regrettably, we do not live in such a world, and with our present stage of knowledge must frequently have recourse to surgery to reach a diagnosis or to effect a cure or palliation.”

So as I have always taught: ‘’Surgery is the inefficiency, inability and weakness of medicine.”

We have just at the beginning of investigating the real dynamics of diseases, and in the near future surgery is going to be used only for trauma, caesarean section and cosmetics.

Meanwhile we have to find a new and easy approach to reach the aim, and always asking ourselves as we approach surgical processes:.

•What are we doing?

•Why are we doing it?

•How do we do it?

•How can we do it in a better way?

In my presentation, I will explain how my hospital approaches surgery with the help of international advisers like Michael Stark, and will compare the results with those of conventional methods, taking into account different aspects including health-related quality of life, and cost effectiveness of this surgical approach.