S003 Credentialing And Accreditation Of Robotic Surgery

Tan Teck Wei

The concept of surgical training has evolved from the traditional concept of “see one, do one, teach one” towards standardised methodologies for surgical education. Credentialing of robotic surgery should involve a structured training programme and curriculum before formal accreditation and credentialing. A training programme should include theoretical training, live case observation and bedside assistance, laboratory training, non-technical skills training and modular training before final evaluation. In order to be credentialed to perform robotic surgery, the surgeon should have proof of formal training, documented experience including appropriate case volume and satisfactory outcomes, and a formal assessment of competency including proctored cases and assessment of medical knowledge, decision-making and technical skills.

S011 Personal Experience With The Development Of Robotic HPB Over 16 Years (2001- 2017)

Anusak Yiengpruksawan, MD, FACS, FRCST (hon.); Director, the Bumrungrad Robotic Surgery Center, Bumrungrad International Hospital, Bangkok, Thailand; Adjunct Clinical Professor, the Minimally Invasive Surgery Section, Department of Surgery, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Application of the daVinci in HPB surgery reportedly began in 2000 soon after the system was cleared by the US FDA for use in general surgery. My (former) hospital (Valley Hospital in Ridgewood, NJ) was one of the first few in the USA to acquire the system in July 2001. Although it is a private community hospital that locates only 20 minutes from New York City, a highly competitive area, we have been able to achieve considerable success with our robotic surgical program. Our robotic systems have been upgraded continuously and we now have 2 Xi systems in use since 2015.

My involvement with the daVinci was right from the start. I did my first robotic pancreatic surgery (distal pancreatosplenectomy), after having completed 12 other simpler robotic cases, near the end of the first year (2001) using the 3-arm daVinci. Since then, up until my retirement from the hospital in December 2017, I have personally performed a total of 1100 robotic cases. Of these, there were 255 pancreatic (64 Whipples, 95 distal pancreatosplenectomy, 55 distal pancreatectomy, 6 central pancreatectomy, 9 total pancreatectomy, 13 enucleations, and 13 pseudocyst drainage procedures), 56 hepatic, 24 common bile duct, and 50 gall bladder surgeries. Of the pancreatic group, the overall 30-day perioperative mortality, morbidity, and the conversion rates were 1.2 % (3/255), 9.8% (25/255), and 4.7% (12/255). There was no mortality in the remaining groups.

Conclusion: Robotic HPB surgery can be successfully developed even in a small community hospital provided that the surgeon is a trained and experienced HPB surgeon with enough case volume.

S015 Setting Up, Docking Of Da Vinci Robot

Jason Chan

In exploring how to startup a da Vinci robotics program we will explore the setup of different versions of the da Vinci robotic systems including the camera placements and instruments for the Si, Xi and SP systems to approach transoral robotic surgery. We also explore the differences required in the appropriate docking of these different robotic systems.

S020 Current Evidence For And Future Of Robotic HPB Surgery

Tang Chung Ngai; Chief of Service, Department of Surgery; Director of MAS Training Centre; Director of HKEC Training Centre; Deputy Hospital Chief Executive; Pamela Youde Nethersole Eastern Hospital, HKSAR

Minimally invasive surgeries have been shown to be safe and effective for numerous gastrointestinal conditions. Minimally invasive surgery benefits patients in terms of aesthetics and early recovery, and medical institutions in terms of the low cost associated with a short hospital stay.

Traditionally, HPB surgery is considered as one of the most complex surgeries among other abdominal procedures. Its minimally invasive surgical development also lags behind other gastrointestinal organs' development. Recently, there has been growing interest in the ability to perform complex HPB procedures using the laparoscopic approach. These advanced techniques require surgeons to have highly experienced laparoscopic skills and therefore the development is slow.

The recent introduction of robotic surgical system in the last decade has revolutionized the field of minimally invasive surgery. It was developed to overcome the disadvantages of conventional laparoscopic surgery. Robotic surgical systems can enhance a surgeon's dexterity in the surgical field through a magnified three-dimensional view, instruments with seven degrees of freedom, and intuitive hand-control movements. These features allow the surgeon to perform delicate tissue dissection and precise intracorporeal suturing. The robotic devices can also shorten the learning curve of difficult laparoscopic procedures for inexperienced laparoscopic surgeons and enable expertise to conduct more complex laparoscopic procedures easily. The main drawback of advanced robotic surgery is the associated cost.

In clinical practice, the robotic system has broadened the indications of minimally invasive surgery into the more complex HPB surgeries such as Whipple operation, major hepatectomy with biliary reconstruction, donor hepatectomy. At the current stage of development, the benefits of robot-assisted surgery in HPB surgery have not yet been clearly defined. Only a small number of case reports / series and nonrandomized studies were available in the literature. Technological innovations and increased surgeon familiarity with this approach will improve, likely leading to greater adoption and acceptance in the future.

S022 Tips And Tricks For Large Fibroid Uterus

Jiheum Paek

Fibroids or leiomyomas, the smooth muscle tumor in the uterus, are one of the most common benign disease in gynecologic fields. They often need surgical treatment, including myomectomy or hysterectomy. The technical level of surgical options depend on the size, number, location of fibroid in the uterus. Although laparoscopic approach has been popularly used, surgeons often feel technical difficulty when they use straightened instruments. Furthermore, laparoendoscopic single site surgery is technically challenging and reduces instrument triangulation and robust retraction, and is associated with a steep learning curve.

Robotic surgical system, including robotic single-site surgery, is very useful for treatment in large fibroids in the uterus. Robotic surgery has evolved to play a role in gynecologic surgery. In addition, the technology and techniques related to robotic surgery are still evolving to the direction of easier and less invasive laparoscopic surgery. It is obvious that the da Vinci Surgical System (Intuitive Surgical, Inc, Sunnyvale, California, USA) offers several advantages over conventional laparoscopy including three-dimensional view, greater dexterity, and tremor filtration. The surgeon console features multiple ergonomic adjustments for increased comfort and reduced fatigue during surgical procedures. Advanced system software correlates the surgeon's hand movements to the instrument tips, restoring Intuitive control to what would otherwise be cross-handed surgery. Transumbilical entry with da Vinci Single-Site enables a virtually scarless surgery, providing patients one of the most cosmetically appealing results of any available surgical approach. The da Vinci System's remote center

technology is designed to limit cannula movement at the patient's abdominal wall, minimizing potential port-site trauma and postoperative pain.

Several videos will be shown at this symposium and you will be able to see how to set up robotic surgical system and surgical tips to optimize robotic procedures in patients with large uterine fibroids.

S025 Robotics Esophagectomy- Boon or Bane?

Yin-Kai Chao; Chief, Department of Thoracic Surgery, Chang-Gung Memorial Hospital- Linkou,Taiwan

Robotic surgery is a new and exciting emerging technology that is taking the surgical profession by storm. Up to this point, however, the race to acquire and incorporate this emerging technology in upper GI surgery field(especially in esophagectomy) has primarily been driven by the market. In addition, the robotic technology has become the entry fee for centers wanting to be known for excellence in minimally invasive surgery despite the current lack of practical applications. Whether this technology have more of a marketing role than a practical role remained to be seen.

Because our thoracic surgery center is currently witnessing this technology shift and has implemented a dedicated unit for robotic esophagectomy. We have accumulated many experiences in this new platform. However, there is a paucity of information on whether or not there are advantages to transitioning to robotics by surgeons who are already proficient in performing thoracoscopic esophagectomy. As a result, we chose to evaluate this transition to determine if any advantages exist, with special focus on comparing the efficacy and safety of lymph node dissection around the upper mediastinum and the rate of complication after such extensive dissection.

S026 Technique Of Robotic Esophagectomy: How I Do It?

Yin-Kai Chao; Chief, Department of Thoracic Surgery, Chang-Gung Memorial Hospital- Linkou,Taiwan

After placing the patient in the left semi-prone position under single lung ventilation, we created an artificial pneumothorax through CO_2 insufflation (pressure: 6−8 mmHg). The trocar design for robotic esophagectomy is as follows: 1) a 30-degree angled thoracoscope was placed in the seventh intercostal space (ICS) along the posterior axillary line; 2) the right second robotic arm was positioned in the fifth ICS along the mid axillary line, medially to the scapula; 3) the left robotic arm was placed in the ninth ICS along the posterior axillary line; 4) the first right robotic arm was positioned in the third ICS along the mid axillary line; and 5) the assistant port was placed in the seventh or eighth ICS along the mid axillary line.

Right recurrent laryngeal nerve(RLN) lymph node dissection(LND) started with the incision of the mediastinal pleura along the course of right vagus nerve until the right subclavian artery level. After exposure of the vagal nerve epineurium, the right RLN was identified at its recurring point (located caudally to the right subclavian artery). Left RLN LND was begun by releasing the right esophagotracheal band. Subsequently, the trachea was gradually rotated clockwise through the application of a gentle pressure on the left edge of the tracheal cartilage. After the complete release of the bilateral esophagotracheal band, the esophagus was retracted toward the dorsal side with the right first robotic arm. Simultaneously, an assistant rolled back the trachea using a forceps grasping a small piece of gauze, with the aim of improving operative exposure. The left RLN was identified in the middle of the soft tissue between the trachea and the esophagus. Dissection was started from the ventral RLN nodes and subsequently continued toward the dorsal side until the total skeletonization of the left RLN.

S029 Transoral Robotic Surgery Using The Da Vinci Single Port Robotic Surgical System

Raymond Tsang, University of Hong Kong

Introduction - The next generation flexible surgical robot, the da Vinci SP robot has been evaluated for urological use in 2014 and subsequently applied for TORS oropharyngectomy, hypopharyngectomy and nasopharyngectomy in a cadaveric model. We describe the first clinical trial of the da Vinci SP robot for TORS.

Materials and methods - The da Vinci SP robot is a next generation system incorporating a stereoscopic binocular camera and three 6mm flexible instruments in a cannula of 2.5cm diameter. The flexible robotic arms allow the instruments to be deployed from the oral cavity to the nasopharynx, oropharynx, hypopharynx and larynx. We describe our experience of the first human clinical trial of TORS in the 21 patients.

Results – Operating field included 2 case of nasopharynx EUA, 9 cases of base of tongue resection, 5 cases of radical tonsillectomy, 4 cases of laryngeal/hypopharynx operations and 1 case of neopharyngeal stricture dilation. There was no conversation to alternative procedure. Mean time required for application of the retractor to obtain exposure was 21.3 minuets (range 4-43 minutes). Mean docking time of the robot was 3.3 minutes (range 1-5 minutes). There were no serious adverse events or adverse events related to the use of the da Vinci SP surgical robot. The margins of all the cancer resection cases were negative.

Conclusion – Early clinical experience of the da Vinci SP surgical proved that the system is capable of performing transoral robotic surgery in the upper aerodigestive tract. Further studies should be conducted to compare the efficacy of the new robot with the current generations of multi-arm robots in TORS.

S032 Differences In The Uterine Myomectomy By Robotic And Laparoscopic Surgery

Hiroe Ito

In Japan, robotic surgery had been performed since 2009, but at last this year only robotic surgery for endometrial carcinoma and robot-assisted hysterectomy for benign uterine tumors were covered by insurance. However, robot-assisted myomectomy still does not allowed the insurance. Therefore, it is only performed at the limited facilities. Since Tokyo Medical University had carried out laparoscopic surgery using subcutaneous abdominal wall lifting method (SAWL) since 1993, we usually performed the surgery for the uterine myomectomy using laparoscopic surgery. Therefore we have not enough experience of robot-assisted myomectomy, but today I'd like to talk about their differences.

Difference 1- Port position is below the umbilicus in the case of laparoscopic surgery, but robotic surgery is on or above the umbilicus.
Difference 2- Because we use scalpels instead of the morcellator for the takeoff of fibroids in SAWL, it does not cost.
Difference 3 - Robot-assisted myomectomy is not covered by insurance, so it is a burden on the patient and at this time it is hard to spread in Japan.
Difference 4- Since the robotic surgery is easy to suture as compared to the conventional laparoscopic surgery, the thread does not loosen, so the risk of uterine rupture can be avoided during postoperative pregnancy.

From the above, SAWL has more merit than the roboic surgery, but it is more reliable in operability than the conventional laparoscopic surgery.

S037 Gastrectomy For Cancer: Why Robotic?

Sang-Uk Han; Department of Surgery, School of Medicine, Ajou University, Suwon, Korea

During the last decade, developments in laparoscopic instruments and technologies have led to major surgical breakthroughs, and many reports have demonstrated the clinical advantages of laparoscopic gastrectomy for gastric cancer compared with open surgery. Although the long-term oncological safety of this technique is yet to be established, many retrospective studies demonstrated that laparoscopic distal gastrectomy was comparable to open distal gastrectomy in terms of short-term and long-term outcomes. Thereby, laparoscopic gastrectomy is now considered a safe and technically feasible treatment option for early-stage gastric cancer.

Further refinements in the surgical environment have been attempted with the robotic surgical platform to overcome the shortcomings of conventional laparoscopic surgery. These improvements include three-dimensional imaging, enhanced dexterity with articulated robotic arms, comfortable operator position, and integrated emerging technologies such as indocyanine green fluorescence. However, a recent multicenter phase II trial failed to show the superiority of robotic gastrectomy over laparoscopic gastrectomy: A total of 434 patients (223 robotic gastrectomies and 211 laparoscopic gastrectomies) were analyzed on intention-to-treat and per-protocol bases. The operative time was longer (221 vs. 178 min, $p < 0.001$) and the total cost was higher in the robotic group (13,432 vs. 8,090 USD, $p < 0.001$), whereas the complication rate and estimated blood loss were not different between the two groups (11.9 vs. 10.3% [$p = 0.619$] and 50 vs. 55 mL [$p = 0.318$] in per-protocol analysis, respectively). Thus, the clinical advantage of robotic gastrectomy for gastric cancer remains unclear, and several clinical trials are under way to determine the adjunct benefits of robotic gastrectomy in specific clinical settings.

Many efforts have been made to determine the clinical benefits of robotic gastrectomy over laparoscopic gastrectomy during the past decade. Kim et al. reported the result of a retrospective study comparing 87 cases of RDG to 288 cases of LDG, with a focus on the performance of lymphadenectomy in the N2 area. The mean harvested number of N2 was significantly higher in the RDG group (16.3 vs. 13.2, $p = 0.001$). Similarly, Son et al. reported a higher number of retrieved lymph nodes of the suprapancreatic area in robotic total gastrectomy (14.5 vs. 11.3, $p = 0.023$). More recently, Suda et al. reported that robotic gastrectomy showed lower rates of local complications, such as pancreatic fistula, than did laparoscopic surgery (1.1% vs. 9.8%, $p = 0.007$).

One of the ignored advantages of robotic surgery in previous studies is that the surgeon can manipulate the four robotic arms including the camera view at will. This advantage allows the surgeon to have a relatively independent ability from that of the first assistant or the scopist, compared with conventional laparoscopic surgery. Thus, it is hypothesized that robotic gastrectomy may surpass laparoscopic gastrectomy after the operators acquire long-term experience and skills in the manipulation of robotic arms; however, we failed to show that RDG can surpass LDG in terms of surgical outcomes after acquiring long-term experience in terms of operation time and blood loss, based on our experience.

Another advantage of robotic surgery is the integrated techniques such as TilePro™ and Firefly™, which allows surgeons to perform image-guided robotic gastric cancer surgery: surgeons can see both the CT images and surgical view simultaneously during the operation, and harvest lymph nodes for lymphadectomy as an adjunct for the identification of relevant lymph node basins in real time during robotic gastrectomy. In our institution, we conducted a pilot study to determine the adjunct role of ICG fluorescence in gastric surgery. ICG fluorescence imaging for identifying the shape and origin of a small vessel such as infrapyloric artery, which is unpredictable in preoperative imaging studies. The overall positive predictive value of ICG fluorescence was 80%, thus this would be helpful for robotic pylorus-preserving gastrectomy.

There is a potential advantage of robotic gastrectomy for locally advanced upper third cancer; robotic system is assumed to achieve sufficient lymphadenectomy especially in the splenic hilum compared to laparoscopic total gastrectomy. Laparoscopic splenic hilar node dissection remains a time-consuming procedure that requires

meticulous surgical technique to avoid unexpected injury to a splenic vessel or the pancreas. The intricacy and variability of the splenic vessels in the splenic hilum makes it very difficult for surgeons to dissect the splenic hilar nodes laparoscopically without performing a splenectomy. Furthermore, a recent retrospective study showed that, on average, fewer splenic hilar lymph nodes are retrieved in laparoscopic surgery than in open surgery. Thereby, robotic system may be a good solution for this technical difficulty in spleen-preserving total gastrectomy. The AaRON study, a phase II study for feasibility D2 dissection in locally advanced gastric cancer, is underway and may answer for this question in the near future.

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S038 Technique Of Robotic Gastrectomy: How I Do It?

Sang-Uk Han; Department of Surgery, School of Medicine, Ajou University, Suwon, Korea

Robotic technology has been introduced to gastric cancer surgery more recently than laparoscopic methods. Therefore, most robotic procedures, including radical lymphadenectomy and reconstructions, are based on those of laparoscopic surgery. Currently, various reconstruction techniques are used in laparoscopic gastrectomy, and these are currently reproduced by the robotic surgical systems, utilizing the improved dexterity resulting from the internal articulated endoscopic wrist. Notably, there is a recent trend for robotic gastrectomy reconstructions to move from extracorporeal procedures to intracorporeal procedures, referred to as ‘full or totally robotic gastrectomy’, in which all gastric resection and reconstruction is performed intracorporeally, under direct laparoscopic view, without a mini-laparotomy. However, the advantages of the ‘totally robotic procedure’ have not been firmly identified, even for laparoscopic surgery; its clinical benefits are assumed to be reduced postoperative pain, reduced surgical site complications, and enhanced postoperative recovery.

Intracorporeal reconstruction during distal or total gastrectomy remains the most critical and technically challenging step, even in laparoscopic surgery. Various methods for laparoscopic distal or total gastrectomy have been introduced, but no standard protocol has been established. Our institution has developed novel methods for Billroth I and esophagojejunostomy after distal or total gastrectomy. The great advantage of these methods is the reproducibility even in totally robotic gastrectomy. Herein, I would like to introduce our reconstruction methods in totally robotic gastrectomy.

The linear-shaped gastroduodenostomy (LSGD) was firstly developed by our institute and published in 2016. This new approach was simple to perform and was associated with a lower rate of bile reflux than that with delta-shaped anastomosis. The learning curve in laparoscopic distal surgery and robotic surgery were 29 and 44 cases respectively. In addition, the long-term endoscopic findings showed that the presence of residual food decreased over the time. The technical details of LSGD are as follows: 1) A linear endo-stapler is introduced through the left lower assistant port, transecting the duodenum in a craniocaudal direction without 90º duodenal

rotation; 2) A small entry hole is made on the superior edge of the duodenal transection line; 3) A small incision is made on the greater curvature of the remnant stomach 60 mm from the resection line; 4) The cartridge jaw of the 60 mm endoscopic linear stapler is inserted into the remnant stomach; 5) The greater curvature of the remnant stomach and anterosuperior side of the duodenum are aligned and the stapler fired; 6) Using another 60 mm endo-stapler is applied to close the common entry hole.

Regarding intracorporeal Roux-en-Y esophagojejunostomy, the overlap method is one of the most favored currently. However, this method has several technical shortcomings such as difficulties obtaining traction on the esophageal stump that necessitates the use of an additional stay suture, the risk of unintended stapling of the left crus, and the need for an additional stay suture when closing the common entry hole. Thereby, we developed a modified overlap method using two barbed knotless sutures, namely MOBS. In a previous study, we reported the satisfied outcomes of this method; the mean operative time and procedural time of E-J stomy were 180.6 min and 22.4 min. Interestingly, laparoscopy and robot subgroups did not differ in mean MOBS procedural times (22.2 vs. 22.7 min, $p = 0.787$). From April 2015 to Sep 2018, we performed about 190 cases after laparoscopic or robotic total/proximal gastrectomy and there were only 3 cases of anastomotic leakage (1.6%). The technical details of MOBS are as follows: 1) Two barbed threads are sutured on the stapled line of the esophageal stump. They are located on the middle portion of the esophageal stump 1 cm apart from each other. 2) An opening is made on the esophageal stump using an ultrasonically activated shears. Theoretically, the stapled line should contain the anterior and posterior esophageal walls so that cutting the staple line means the anterior and posterior walls will be cut simultaneously. This will help the surgeons to readily identify the intraluminal space with a sufficient opening. 3) An anastomosis is made between the esophageal stump and the jejunum in the antero-posterior fashion. The anastomosis procedure starts with a jejunal opening that is made at the anti-mesenteric side of the jejunum and is about 15–20 cm away from the Treitz ligament. The cartilage jaw of a 45 mm-long purple-colored stapler is then introduced into the jejunum, and the jaws are closed. The stapler is then angled and ascended toward the axis of the esophageal stump. At this moment, the pre-sutured barbed threads should be pulled downward to reduce the tension on the jejunal mesentery. The staple is then slightly opened, and the anvil jaw is introduced gently into the esophagus *via* the space between the right and left crura. 4) After firing the stapler, the common entry hole is closed bi-directionally by hand-sewing using the pre-sutured barbed threads. Since the pre-sutured barbed threads are located at lateral angles to the common entry hole, they function both as a landmark and the stay sutures during the closure of the common entry hole. 5) After completing the esophagojejunostomy, the roux limb and the biliopancreatic limb are separated by dividing the jejunum with a 60 mm-long tan-colored stapler. A side-to-side jejunojejunostomy is made with two 60 mm-long tan-colored staplers at the roux limb about 45–50 cm away from the esophagojejunostomy without mesentery division. The mesenteric defect between the roux and biliopancreatic limbs is then repaired using another barbed suture.

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S041 Robotic Thyroidectomy

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Robotic thyroidectomy has developed to minimize surgical morbidity and improve cosmesis by avoiding a visible neck scar. There have been many attempts to perform endoscopic/robotic thyroidectomy by using a remote site incision such as an axillary, breast, anterior chest, facelift, or transoral incision. The application of the da Vinci Surgical System offers some advantages over traditional endoscopic thyroidectomy including improved surgical ergonomics and surgical dexterity. Since 2005, we have been performing endoscopic and robotic thyroidectomy by a gasless unilateral axillary (GUA) or axillo-breast (GUAB) approach and postauricular facelift approach for benign and malignant tumors of thyroid. I also started transoral thyroidectomy sine last year. The most significant advantages of remote access robotic thyroidectomy are the excellent post-operative cosmesis and slighter better postoperative voice function.
Furthermore, robotic/endoscopic thyroid surgery has been extended to lateral neck dissection. Robotic neck dissection via a transaxillary, breast, or facelift approaches has been performed for thyroid cancer.

In this lecture, I would like to present the evolution and recent advances in robotic thyroidectomy and lateral neck dissection with their surgical, functional, cosmetic and oncologic outcomes.

S043 Robotic Neck Surgery For Benign Tumors

Tsung-Lin Yang MD. PhD.; Department of Otolaryngology, National Taiwan University Hospital and National Taiwan University College of Medicine, Taipei, Taiwan

Surgery remains the mainstream for treating cervical tumors. Particularly for benign tumors, such as the tumor of salivary glands, soft tissue, and a variety of congenital diseases, surgical interventions are always suggested for curative treatments. Conventional open surgery results in obvious scars on the anterior neck. Compared with endoscopic methods, robotic surgery provides more appealing surgical approaches and techniques. Here we reported the feasibility and efficacy of performing cervical tumor resection by robotic surgery through a trans-hairline approach. Patients who were diagnosed with cervical tumors and treated by trans-hairline robotic surgery were recruited for evaluation. Robotic surgery was successfully performed in all enrolled patients by the trans-hairline approach. Complete tumor removal was achieved by robotic surgery through trans-hairline approaches. Neither operative complications nor postoperative nerve functional deficits were found. An esthetic outcome was maintained by concealing the scars within hairs. No recurrence was noted in the follow-ups. Our results indicated that the trans-hairline approach is a feasible surgical method of robotic surgery, serving as a useful alternative to conventional techniques with potential safety and esthetic merits

S046 Is Technique Of Robotic Radical Prostatectomy Different For High Grade Prostate Cancer?

Ashok Hemal

Radical prostatectomy is a feasible option for patients harboring high-risk PCa and contemporary outcomes are encouraging regarding the reasonable utilization of RARP. Pathological, perioperative, and functional outcomes are comparable with high-risk patients undergoing ORP. Furthermore, performance of an extended lymph node dissection can provide an adequate postoperative histopathological staging in patients receiving RARP. When talking about high-risk PCa one has to acknowledge the wide spectrum of the disease, as it is dependent on its definition. As of now, there is no single definition, which is able to characterize all men with high-risk PCa but instead clinical stage, Gleason score, and PSA are used to predict disease recurrence, progression, and PCa-related mortality. Although there is a consensus on high-risk PCa patients requiring multi-modal treatment approaches. Specifically considering the biology and heterogeneity of high-risk disease, RP offers distinct advantages as compared to non-invasive treatment. RP is the only modality providing adequate pathological

specimens for precise staging. Given that up to 35% of patients are staged erroneously and almost half of high-risk patients turn out to have more favorable histopathology after final pathological review. RP represents the most sufficient tool to accurately offer targeted therapy to patients without increasing risks of unnecessary treatments. In addition, RP guarantees definite cytoreduction of the tumor, which might improve overall outcomes, due to the important role of the primary tumor in terms of cytokine and growth factor production as well as tumor shedding. The outcomes following RARP for the treatment management of high-risk PCa are equivalent to ORP and RARP seems to be an effective and safe option for select high-risk patients. The preservation of the neurovascular bundles is feasible in highly select cases and may contribute to improved functional outcomes. Similarly, an adequate extended pelvic lymph node dissection can be performed robotically and may also increase the detection of positive lymph nodes to improve histopathological staging.

I shall be presenting and discussing on this topic.

S047 Expanding RARP To Advanced And Oligometastatic Cancers

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Since the introduction of the da Vinci Surgical System first time in Korea at Yonsei University in 2005, more than 21,000 robot surgical cases were performed which is the most experience in the world. Current review of use of robotics in advanced and oligometastatic prostate cancer is another frontier at Yonsei. Results from Yonsei experience of more than 7,000 cases of robotic urological cases is presented as an example of robotic surgery in Asia. The most common procedure, robotic prostatectomy was analysed in detail including oncological and functional profiles. In 2018 there are new ways of performing prostatectomies are available and will be discussed also.

Keywords: Robotic surgery, Prostate Cancer, Prostatectomy, Oligometastatic

S055 Trans-Oral Robotic Surgery For Pharyngeal And Laryngeal Cancers

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After da-Vinci robotic surgical system has been widely used by cardiothoracic and urologic surgeons to assist their endoscopic surgery, the robotic assisted technique has also been adopted for treating head and neck diseases. The da-Vinci robotic surgical system has several unique characteristics including 3-D high magnification endoscope, endo-wristed instruments with motion scaling & tremor reduction function. The aforementioned techniques enable doctors to perform endoscopic surgery with precision, dexterity and control.

Nowadays, one of the rapid emerging robotic surgeries in ENT field is trans-oral robotic surgery (TORS) for upper airway diseases including early T classification pharyngeal and laryngeal cancers. The commonly surgical indications are oropharyngeal tumors involving palatine tonsil, tongue base and supraglottis. However, we have extended the application to manage hypopharyngeal cancer, glottis ca with anterior commissure involvement and even total laryngectomy.

According to our published papers and prospective studies, TORS could offer our patients with good survival rate/ local control rate/organ preservation rate and satisfactory swallowing and phonation outcomes. The surgical morbidities could be reduced and a majority of our patients could avoid irradiation therapy or reduce the dosage of radiotherapy. In this speech, I will share my experiences of TORS by reporting the data. The advantages of TORS will be introduced and discussed. However the da-Vinci robot is expensive, and the cost of TORS is still high in Taiwan and not covered by the National Health Insurance system. There is no standardized national training program so far in my country. The constant progress of head and neck robotic surgery needs further cooperation and communication between experts from all over the world in the future.

S059 Robotic Simple Prostatectomy For BPH: Is It That Simple?

Ashok Hemal

Robotic simple prostatectomy is a viable option for surgical management of lower urinary tract symptoms (LUTS) in men with large prostatic adenoma. Robotic simple prostatectomy (RASP) has been popularized in the last years and combines the benefits of minimally- invasive surgery with the efficacy of conventional simple prostatectomy for large prostate grade 4 and above. I will describe different RASP techniques (transvesical (Frayer's, Millin's , Posterior Cystotomy approach and complete anatomical approach). I shall be discussing all these techniques with pros and cons. I will also be presenting a new technique robotic total prostatectomy for low grade prostate cancer.

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S060 Role Of Robotic Reconstruction In Ureteric Structures – Overview Of Proximal, Mid And Distal Strictures

Ashok Hemal

Advancements in robotic surgical technology have enabled urologists to better meet the demands of minimally invasive ureteral reconstruction. A wide range of benign and malignant disease can be me managed with robotic surgery. Various applications have been described in the literature, and outcomes are generally excellent with low rates of disease recurrence and rare major complications. I will present basic techniques for robotic ureteral reconstruction as well as more detailed instruction for specific procedures. Ureteral reconstruction is an excellent application of robotic surgery. While limitations in conventional laparoscopic technology led to a steep learning curve for even experienced laparoscopic surgeons attempting minimally invasive ureteral reconstruction, the strengths of robotic surgery have allowed for novice and expert robotic surgeons, alike, to perform complex upper urinary tract surgery.

Suggested readings:

1: Stanasel I, Atala A, Hemal A. Robotic assisted ureteral reimplantation: current status. Curr Urol Rep. 2013 Feb;14(1):32-6.
2: Nayyar R, Gupta NP, Hemal AK. Robotic management of complicated ureteropelvic junction obstruction. World J Urol. 2010 Oct;28(5):599-602.
3: Hemal AK, Nayyar R, Gupta NP, Dorairajan LN. Experience with robotic assisted laparoscopic surgery in upper tract urolithiasis. Can J Urol. 2010
Aug;17(4):5299-305.

S068 Surgical Anatomy Of The Tongue Base For TORS

Filippo Montevecchi

Surgeon who performs transoral robotic surgery (TORS) need "to see" the anatomical structures from a new perspective, with a less important role played by the traditional, well known, surgical landmarks. This "inside-out" vision must be well understood by those surgeons dealing with transoral robotic-assisted procedures. In this presentation the transcervical and transoral antomy of the tongue base will be compared.

S069 Indications And Constrindications Of TORS For OSA

Filippo Montevecchi

Obstructive sleep apnea hypopnea syndrome (OSAHS) is a significant worldwide healthcare problem. Despite multiple available procedures to surgically treat OSAHS, current treatments continue to rely on careful patient selection and appropriate application of surgical interventions. The purpose of this talk is to discuss appropriate patient selection when considering TORS as surgical treatment of OSAHS.

S070 TORS Reduction Of Tongue Base For OSA With Da Vinci System

Filippo Montevecchi

The advantages of the magnified 3D high-definition visualization by using da Vinci system, and the precision and dexterity afforded by two-handed, articulating robotic instrumentation, are obvious and “intuitive.” Additionally, numerous peer reviewed articles have shown that TORS allows the surgeon to perform procedures that otherwise could be done only through an open approach, but with less morbidity and better quality of life. In this presentation all the advantages of the da Vinci system will be discussed.

S075 Should Robotic Nephroureterectomy be the Standard of Care?

Ashok Hemal

The gold standard for high-risk upper tract urothelial carcinoma is radical nephroureterectomy with bladder cuff excision (RNUBCE). Regardless of approach, sound oncologic principles must be adhered when performing RNUBCE: nephrectomy, ureterectomy, bladder cuff excision and lymph node dissection.
We have experience of over 250 patients who underwent RNUBCE in last 10 years +. We have compared open, lap and robotic approaches to achieve all components of UTUC surgery.This cohort represents the largest, single-center series with excellent perioperative and favorable long-term oncologic outcomes, hitherto not reported. Will discuss which technique and why.

Suggested Readings:

1: Patel MN, Hemal AK. Does Advancing Technology Improve Outcomes? Comparison of the Da Vinci Standard/S/Si to the Xi Robotic Platforms During Robotic Nephroureterectomy. J Endourol. 2018 Feb;32(2):133-138.
2: Pathak RA, Patel M, Hemal AK. Comprehensive Approach to Port Placement Templates for Robot-Assisted Laparoscopic Urologic Surgeries. J Endourol. 2017 Dec;31(12):1269-1276.
3: Aboumohamed AA, Krane LS, Hemal AK. Oncologic Outcomes Following Robot-Assisted Laparoscopic Nephroureterectomy with Bladder Cuff Excision for Upper Tract Urothelial Carcinoma. J Urol. 2015 Dec;194(6):1561-6.
4: Patel MN, Aboumohamed A, Hemal A. Does transition from the da Vinci Si to Xi robotic platform impact single-docking technique for robot-assisted laparoscopic nephroureterectomy? BJU Int. 2015 Dec;116(6):990-4.
Pathak RA, Hemal AK. Techniques and Outcomes of Robot-assisted Nephro-ureterectomy for Upper Tract Urothelial Carcinoma. Eur Urol Focus. 2018 Aug 23.

S084 Predictors Of Surgical Success Evidence Of TORS For OSA

Filippo Montevecchi

TORS lingual tonsillectomy and multilevel procedures were successful in treating moderate-to-severe OSAHS in selected patients. Preoperative BMI helps the clinician to predict success in these patients. Another important parameter is the type of collapse during sleep endoscopy (antero-posterior collapse) and the height of the tongue base. All these parameters will be discussed during this presentation.

S085 Management Of TORS Complications

Filippo Montevecchi

The purpose of this presentation is to analyze the possible complications that may occur during TORS for OSAHS. An important issue to consider in OSAHS surgery is the airway itself. In sleep apnea surgery, an already difficult airway can be further compromised by edema and bleeding. Difficult intubation facilities must be accessible and an endoscopic assisted intubation will often be necessary. A vessel clip applier and an insulated bipolar forceps should be readily available throughout the surgery. This can allow the bedside assistant to manage intra-operative bleeding. In case of delayed post-operative bleeding, if conservative measures fail, a suspension laryngoscope should be used to achieve an operative view of the base of tongue. It is unlikely that a view of the bleeding area will be achieved with a tonsil gag. Typically a suction-monopolar diathermy device is then used for hemostasis.

S089 TORS Reduction Of Tongue Base For OSA With Da Vinci SP – An Update

Jason Chan

Objective: Transoral robotic surgery (TORS) is advancing at a rapid pace, recently a next generation novel flexible, single-arm robotic surgical system - da Vinci SP (Intuitive Surgical Inc. Sunnyvale), has been described. Here we describe our experience of the system on the world's first clinical experiences for transoral robotic surgery for tongue base reduction in OSA.
Methods: Single center study consistent with a stage 1 (Innovation) study described in the Innovation, Development, Exploration, Assessment, Long-term Study (IDEAL) framework. The study was registered on www.ClinicalTrials.gov (NCT03010813).

Results: At the time of submission five patients had TORS resection of the tongue base. Three patients had obstructive sleep apnoea. For all cases the patient-side cart was docked at 90 degrees. The Crowe-Davis mouth in all cases. The single port cannula was located 10-15cm away from the mouth opening to enable deployment of both the wrist and elbow joints. The camera arm and three instrument arms easily fit transorally, the movement was smooth. The extra arm significantly aided with traction for tumour resections. There were no conversions of the robotic system and no adverse events related to the use of the da Vinci SP.

Conclusions: The first clinical studies clearly demonstrate that the da Vinci SP system is safe and that it is feasible to use in TORS for tongue base reduction in OSA

S089 TORS Of Robotic Surgery – Malaysia Experience

Ahmad Kusyairi Bin Khalid

The da Vinci® Surgical System is a robotic surgical system designed to assist surgeons using a minimally invasive approach. It was approved by the FDA in 2000 and was initially used for general laparoscopic surgeries[1]. Subsequently its role was explored in head and neck surgeries and after more than a decade, this innovative approach has been increasingly adopted by head and neck surgeons all over the globe for treatment of benign and malignant conditions of the oropharynx and larynx.

In Malaysia, the first transoral robotic surgery (TORS) was performed in May 2016 for obstructive sleep apnoea partly caused by lingual tonsils hypertrophy in a private medical center[2]. In the public health service setting, the first TORS was performed in March 2018 for tonsillectomy and excision of Warthin's duct cyst, with the assistance of Dr Toh Song Tar from Singapore General Hospital[3]. This landmark surgery started a wave of interest and confidence in performing more TORS surgeries in the public hospital setting for extended tonsillectomy, base of tongue procedures such as excision of tumour and lingual tonsillectomy as well as partial epiglottectomy.

The challenges in setting up and introducing a new innovative surgical technique will be discussed. Learning points from this new experience and methods of improvement will be shared in this talk.

1. Byrd, J. K., & Duvvuri, U. (2013). Current trends in robotic surgery for otolaryngology. Current Otorhinolaryngology Reports, 1(3), 153–157. http://doi.org/10.1007/s40136-013-0025-6.
2. Fong, L.F. (2016). Breathing a sigh of relief. The Star News.
3. Idris, A.R. (2018). Pakar UiTM cipta sejarah bedah tonsil guna robot. Utusan Malaysia.

S093 Robotic Intracorporeal Ileal Conduit And Neobladder: Tips And Tricks

Eddie Chan
The Chinese University of Hong Kong

Radical cystectomy and pelvic lymph node dissection are the standard treatment options for muscle-invasive bladder cancer. After the first reported case of robot-assisted radical cystectomy (RARC) by Beecken et al. in 2003 and first case series by Menon et al. in 2005, the surgical techniques have been modified and standardized in recent years. Intracorporeal reconstruction during RARC remains the major challenge and the benefit is yet to be proven. In this presentation, I will share the experience in performing total intracorporeal ileal conduit and neobladder reconstructions. Surgical tips and tricks will be discussed from review of video clips.

S095 The Evolution Of Radicality In Cervical Cancer Surgery: When Less Is More!

Kung-Liahng Wang, MD; Superintendent, Taitung MacKay Memorial Hospital, Taiwan; Professor, Dept. of OBS and GYN, Mackay Medical College, Taipei, Taiwan; President, Taiwan Association for Minimally Invasive Gynecology (TAMIG); President, Taiwanese Gynecologic Oncology Group (TGOG**)**

Cervical cancer (Cx Ca) is not only the most frequently reported cancer among women, but is also the most common gynecological malignancy worldwide. According to the National Comprehensive Cancer Network (NCCN) guidelines, the conventional management of patients with early-stage diseases (stage IA to IB1) is radical hysterectomy with pelvic lymphadenectomy. However, the complete removal of parametrium during radical hysterectomy may not be necessary in most of these women due to the relatively low incidence of parametrial involvement on final pathology, which are approximately 5-30% in patients with early-stage diseases. Moreover, the risk of parametrial involvement in women with tumor extension less than 2 cm or stromal invasion less than 10mm have been reported to be less than 1 percent. Previous researchers also find that women with radical hysterectomy may experience long-term urologic, sexual, and colorectal complications. If we could better identify patients that allow less radical surgery, it is then possible to reduce the need for radical hysterectomy, and preclude the need of parametrial removal in most of these women.

The proposal of selection criteria for performing less radical surgery is therefore importance in women with early-stage cervical cancer. Although there is still lacking sufficient evidence on the application of less radical surgery in women with early-stage cervical cancer, there is a continual surge of interest in identifying factors associated with less radical surgery (conization, trachelectomy or simple hysterectomy) when compared to the more radical surgery (modified radical or radical hysterectomy). In this talk, I will like to discuss the evolution of radicality in cervical cancer surgery from the standard radical hysterectomy to the less radical surgery.