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# Overview of the inaugural congress of Asian Society for Gynecologic Robotic Surgery (ASGRS) 2015

**Jiheum Paek[1], Joseph S. Ng[2]**

*[1]Department of Obstetrics and Gynecology, Ajou University School of Medicine, Suwon, Korea; [2]Department of Obstetrics and Gynecology, Yong Loo Lin School of Medicine, National University of Singapore, Singapore*

## INTRODUCTION

The inaugural scientific meeting of the Asian Society for Gynecologic Robotic Surgery (ASGRS) on gynecological field was held at Advanced Surgery Training Centre of National University Hospital in Singapore, 18 and 19 August 2015. The ASGRS was established for raising the bar on women's surgical healthcare in Asia with robotic surgery through research, innovation, and leadership. In addition, this scientific meeting was aimed at enhancing and sharing up-to-date knowledge about robotic surgery for patients with gynecologic disease. A total of 40 participants from eight countries (Hong Kong, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan, and USA) participated in the congress (Figs. 1-4), which comprised 13 lectures and one live surgery divided into five sessions (Table 1).

## SESSION I. OVERVIEW AND ROBOTIC SURGERY IN GYNECOLOGIC CANCER

### History of gynecologic robotics since 2000: where is it taking us?

Since U.S. Food and Drug Administration approval of the da Vinci Surgical System (Intuitive Surgical, Inc., Sunnyvale, CA, USA) for gynecologic use, robotics has gone from a technology with much promise to one wrought with controversy. Central to this issue are concerns over longer operative times, increased costs, and complications given comparable clinical outcomes when compared with conventional laparoscopy. Is the 'robotics glass' in gynecology really half empty or actually half full? Desai et al. [1] demonstrated that many of the issues often overlooked with rapid technology adoption. The authors also discuss the importance of team building, patient quality of life, and creating a culture of safety, the latter of which alludes to the earlier point of complications being a concern with the 'robotics glass being half empty' perspective. In its purest form, three-dimensional visualization, articulation beyond normal manipulation, and the ergonomics that define the robotic platform are an evolutionary step forward in surgical instrumentation. Although critical appraisal of any new technology should be of paramount importance in medicine, we always must strive to maintain an atmosphere in which cutting-edge forms of technology can be pursued and analyzed with all variables adequately considered [2].

### Robotics surgery in gynecologic cancer

Traditionally, gynecological cancer surgeries were done

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• Correspondening author: **Jiheum Paek**
Department of Obstetrics and Gynecology, Ajou University School of Medicine, 164 World Cup-ro, Yeongtong-gu, Suwon 16499, Korea
E-mail: paek.md@gmail.com

**Fig. 1.** Council members of and speakers of the inaugural Asian Society for Gynecologic Robotic Surgery congress.

**Fig. 3.** Arnold Advincula, then-President of American Association of Gynecologic Laparoscopists.

**Fig. 2.** Opening remarks by Joseph Ng, the first President of Asian Society for Gynecologic Robotic Surgery.

**Fig. 4.** Participants of the inaugural Asian Society for Gynecologic Robotic Surgery congress.

by laparotomy. However, a switch to minimal invasive procedures in the past decade happens because of better development in instruments and patients' request. Most of the gynecological cancer operations could now be done laparoscopically. Because there are several advantages of laparoscopic surgery over laparotomy, including less pain, cosmetic value, faster recovery, less blood loss, less morbidities, and shorter hospital stay. In addition, robotic surgery has similar advantages compare to laparoscopic surgery [3]. For cervical cancer, robotic radical hysterectomy (RRH) was associated with less blood loss and shorter hospital stay compared to laparoscopic radical hysterectomy. There were no significant differences in operative time, complications, mortality, transfusion, conversions, number of retrieved lymph nodes, and recurrence or disease-free survival between the two groups [4,5]. RRH for cervical cancer is safe and feasible and it may be an alternative treatment. However, more randomized controlled trials investigating the long-term oncological outcomes are required to determine the advantages of RRH in cervical cancer.

## Finding the sweet spot in gynecologic robotics

The presentation outlined for the audience some key considerations in creating a sustainable robotic surgical program in gynecology. These considerations were presented as important learning points and issues in the arenas of institutional policy, leadership, finance, and clinical care. The Gynecological Robot Assisted Cancer and Endoscopic Surgery program in the speaker's home institution, the National University Hospital was used as an example to help the

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**Table 1.** Program of the inaugural scientific meeting of Asian Society for Gynecologic Robotic Surgery (ASGRS)

| Time | Title | Speaker |
|---|---|---|
| Day 1: 18 Aug 2015 (Tue) | | |
| 09:30-10:00 | Opening address | Joseph Ng (Singapore) |
| 10:00-11:10 | Session I: Overview and robotic surgery in gynecologic cancer | |
| 10:00-10:30 | Keynote talk - history of gyn robotics since 2000 - where is it taking us? | Arnold Advincula (USA) |
| 10:30-10:50 | Robotics in gyn cancer surgery | Hextan Ngan (Hong Kong) |
| 10:50-11:10 | Finding the sweet spot in gyn robotics | Joseph Ng (Singapore) |
| 11:50-12:50 | Session II: Robotic surgery in benign gynecologic disease (I) | |
| 11:50-12:10 | Tips & tricks for doing a large hysterectomy | Rebecca Singson (Philippines) |
| 12:10-12:30 | Robotic surgery for stage 1-2 endometriosis - worthwhile | John F Dulemba (USA) |
| 12:30-12:50 | Robotic surgery for deep infiltrating severe endometriosis | Andy Tan/Peter Barton-Smith (Singapore) |
| 13:40-15:20 | Session III: Robotic surgery in benign gynecologic disease (II) | |
| 13:40-14:00 | Robotics in urogynecology | Jenifer Marie Jose (Philippines) |
| 14:00-14:20 | Robotic myomectomy tips and tricks, 2-arm technique | Ivan Sini (Indonesia) |
| 14:20-14:40 | How to set up safely for a robotic case - equipment and positioning | Arnold Advincula (USA) |
| 14:40-15:00 | Is robotic technology reducing the rates of abdominal hysterectomy? | Arnold Advincula (USA) |
| 15:00-15:20 | Robotic single-site surgery in gynecology: tips and pitfalls | Jiheum Paek (Korea) |
| Day 2: 19 Aug 2015 (Wed) | | |
| 09:30-11:30 | Session IV: Robotic live surgery | |
| | Staging operation for endometrial cancer | Joseph Ng (Singapore) |
| 11:30-15:00 | Session V: Successful setting up a robotic surgery program | |
| 11:30-11:50 | To be successful you have to commit to robotics | John F Dulemba (USA) |
| 11:50-12:10 | Gyn robotics: a guide to successfully establishing a program in the private sector | Abdul Aziz Yahya (Malaysia) |
| 13:00-15:00 | The establishment of ASGRS | |
| 15:00-15:10 | Closing remark | Joseph Ng (Singapore) |

Date: 18 and 19 August 2015. Venue: Advanced Surgery Training Centre, National University Hospital, Singapore.

audience understand how these issues translated into actionable policies and programs for the implementation of robotic surgery as the standard of care. With robotic surgery as the standard of care in the management of endometrial cancer, this public institution was able to achieve a savings of 300 inpatient bed days a year for every 50 patients with endometrial cancer. The healthcare financing model was that of a public institution caring for patients with government healthcare funding.

## SESSION II. ROBOTIC SURGERY IN BENIGN GYNECOLOGIC DISEASE (I)

### Tips and tricks for doing a large hysterectomy

Most studies set an upper limit for uterine size, usually 15 to 16 weeks' gestation or weight more than 500 g as large uterus [6]. A lot of physicians have suggested that enlarged uteri should be treated by laparotomy. Because there are several surgical difficulties, including the limited access to the uterine vascular pedicles, the high risk of hemorrhage and thromboembolism during surgery, the risk of bowel and urinary tract injury due to poor exposure, and the difficulty

of tissue extraction. Robotic surgery may facilitate the minimally invasive treatment of patients while potentially reducing the rate of abdominal hysterectomies. Payne and Dauterive [7] showed robotic hysterectomy had longer operating time and lower conversion rate to laparotomy compared to laparoscopic hysterectomy. In addition, robotic surgery was associated with less postoperative pain scores regardless of the uterine weight [8]. The robotic platform sets a fulcrum point at the level of entry so the portion of the instrument in contact with the skin does not move from side to side, unlike with traditional laparoscopy; this stability, theoretically, could decrease pulling and shearing trauma, translating into decreased pain for the patient. In this lecture, the preparation for robotic surgery and the tips in order to avoid massive hemorrhage were reviewed, and the robotic hysterectomy in a patient with a 17 cm sized fibroid was presented in a video.

### Robotic surgery for stage 1–2 endometriosis: worthwhile

Endometriosis in adolescents is an important differential diagnosis from pelvic pain and ovarian cysts, mainly among those with no response to conventional treatment. The main forms of involvement are peritoneal and ovarian. Despite the onset of symptoms in adolescence and advances in imaging methods, the diagnosis of this disease is still delayed [9]. In addition, Yang et al. [10] described a recurrence in 53% of the adolescents, only in the small group of five patients receiving GnRH agonist postoperatively in which no recurrence was observed. Robot-assisted laparoscopy allows for improved visualization of endometriosis lesions and presumably more complete treatment. Staging of endometriosis is not reflective of true extent of disease. In this lecture, the superficial resection of endometriosis lesions using robotic system and indocyanine green was presented in a video.

### Robotic surgery for deep infiltrating severe endometriosis

Excision of deep infiltrating endometriosis (DIE) carries recognized major complication rates for rectal shaving of 6.7–24% in conventional laparoscopy, most of which are delayed major bowel or ureteric complications [11,12]. There were no major delayed complications such as bowel or ureteric leaks or fistulae in our series of robotic surgical excision for DIE. However, there were three major intraoperative complications in this series, two of the cases had previous multiple suboptimal surgeries and the other had an anatomically aberrant hidden internal iliac artery due to severe endometriosis. Robotics for DIE is relatively a new procedure improving view, precision and ergonomics that may account for reduced postoperative complications. Other factors that may contribute to surgical outcome include: multiple previous surgeries and co-existing inflammatory pathology such as pelvic inflammatory disease, irritable bowel syndrome or surgeons experience.

## SESSION III. ROBOTIC SURGERY IN BENIGN GYNECOLOGIC DISEASE (II)

### Robotics in urogynecology

Pelvic organ prolapse (POP) is a common problem in parous women. About 40% of all women develop POP in their lifetime [13]. Its incidence increases with age and its etiology is believed to arise from a combination of genetic and environmental risk factors [14]. As life expectancy and patients' complaints increase, a significantly greater number of women need to undergo surgery. The types of repair surgery vary depending on the type of prolapse and associated symptoms. Of these, abdominal approaches using a mesh have been regarded as a gold standard for POP. Abdominal sacrocolpopexy is durable and effective surgical procedure for the correction of apical prolapse [15]. Laparoscopic surgery combines the benefits of the abdominal procedure with the advantages of transvaginal surgery. Additionally, because robotic surgery has greatly improved surgeon dexterity, surgical precision, visualization, ergonomics and allowed procedures that were performed by laparotomy to be performed by laparoscopy, we expected robotic approach might allow surgeons to perform the surgical procedures of sacrocolpopexy or sacrohysteropexy more easily.

### Robotic myomectomy and adenomyosis resection with 2-arm technique

Barakat and colleagues [16] showed robotic-assisted myomectomy was associated with decreased blood loss and length of hospital stay compared with traditional lapa-

roscopy and to open myomectomy. Additionally, robotic technology could improve the utilization of the laparoscopic approach for the surgical management of symptomatic fibroids. Unlike myomectomy, the adenomyosis resection is challenging due to abnormal nature of endometriotic cellular penetration, diffuse lesion, and the association with severe DIE. Surgeons should identify lesion to be resected in order to improve postoperative outcome. A vertical or longitudinal incision at the uterine wall and "orange peeling" enucleating technique are used for adenomyosis resection. Dr. Ivan Sini showed the surgical steps for robotic myomectomy and adenomyosis resection in several videos.

### How to set up safely for a robotic case - equipment and positioning

The robotic system consists of three components. Firstly, the surgeon console, which is located several meters distant to the operating table; the robotic arms, the camera, and the energy source by means of stereoscopic sight, hand manipulators and pedals individually adjusted to the surgeon are controlled by him from the surgeon console. Secondly, the InSite Vision® system, which allows the generation of a 3D sight by using a 12 mm wide angled endoscope containing two 5 mm cameras. Third one is the patient-side cart with the robotic arms and the attached trocars with the fixed special instruments [17]. In this lecture, the equipment and positioning for robotic surgery and the intraoperative complications associated with this treatment modality were presented in a video.

### Is robotic technology reducing the rates of abdominal hysterectomy?

Despite the progress made with laparoscopic techniques for hysterectomy, the abdominal approach remains the most common approach to hysterectomy in many countries. One of the aims of the introduction of the robotic technique is to ultimately increase the proportion of hysterectomies safely completed via a minimally invasive approach, by enabling the surgeon to perform a complex hysterectomy case that would otherwise require laparotomy. Smorgick et al. [18] demonstrated that there was a significant increase in the proportion of hysterectomies completed by a minimally invasive approach between the early (311 patients) and late periods (312 patients) for 7 years in their institution. This was mostly due to a rapid increase in the number of robotic cases (23.8% to 64.1%), while the rates of both laparotomy and traditional laparoscopy declined (17.7% to 5.4%, 39.5% to 17.6%, respectively). This transition in the surgical approach was not associated with increased complications or conversions to laparotomy while maintaining a similar level of surgical complexity [18].

### Robotic single site surgery in gynecology: tips and pitfalls

In gynecologic field, laparoendoscopic single-site surgery (LESS) is performed widely. However, although a lot of studies have been showed regarding feasibility of LESS surgery, it is technically challenging due to its systemic limitations, such as a crush between instruments, an unstable camera platform, the limited mobility of straight instruments, and the lack of instrument triangulation. Due to these limitations, surgeon needs a sustained learning curve period. The concept of combining LESS and robotic surgical systems seems to be a promising choice to overcome the technical complexities of the LESS and satisfied cosmetic result [19]. Paek et al. [20] demonstrated the robotic single-site hysterectomy had longer operating times and less operative bleeding compared to the LESS hysterectomy. Additionally, there was no perioperative complication [20]. In this lecture, the status of robotic single-site surgery for the management of gynecologic disease was introduced and surgical techniques were presented in a video.

## SESSION IV. ROBOTIC LIVE SURGERY: STAGING OPERATION FOR ENDOMETRIAL CANCER

Dr. Joseph S. Ng demonstrated robotic staging operation in patient with endometrial cancer (Fig. 5). Procedures included hysterectomy, pelvic lymphadenectomy, and paraaortic lymphadenectomy. A 68-year-old postmenopausal woman was referred to the hospital for vaginal bleeding for 3 months. The result of endometrial biopsy showed moderately differentiated endometrioid adenocarcinoma with a possible serous component. The docking time, the time for hysterectomy, and the time for pelvic and paraaortic lymphadenectomy was 1, 22, and 40 minutes, respectively. The total operating time was 162 minutes. The final result of pa-

**Fig. 5.** Robotic live surgery in endometrial cancer patient.

thology was endometrioid endometrial carcinoma with tumor stage 1B and grade 3. None of 62 retrieved lymph nodes showed metastasis.

## SESSION V. SUCCESSFUL SETTING UP A ROBOTIC SURGERY PROGRAM

### To be successful you have to commit to robotics

Before starting robotic surgery, surgeons should be aware of the ups and downs of robotic system. The disadvantages of robotic system include expense, longer time for procedure, long set-up time, loss of tissue feedback, learning curve, less chance for education, loss of standard surgical skills, and fear of new technology. Otherwise, the robotic system has several advantages including less traumatic to the patient, better surgeon ergonomics, better visualization, finer control, intuitive movements, 3D, less surgeon fatigue, ambidextrous, and greater degrees of free articulation. Robotic surgery allows surgeons to perform any procedure that can be done by laparotomy or laparoscopic surgery, such as hysterectomy, endometriosis, myomectomy, Burch operation, prolapse repair, and cancer surgery, in selected patients. It is quite conceivable that the surgeon's place will no longer be in the operating room, but instead will be at a remote location in a virtual reality environment orchestrating surgical procedures through electronic linkages similar to the fly by wire technology recently developed for today's military and commercial pilots.

### Gynecologic robotic surgery: a guide to successfully establishing a program in the private sector

In order to achieve a successful robotic surgery program, there are important things that we should consider before and during surgery. First of all, surgeons should make their efforts to understand the advantages and disadvantages of robotic surgery, to give options to patients needing surgery, and to maintain engagement with general physicians and consultants regularly. Secondly, hospitals need to do something to raise surgeons' spirit, including the agreeable attitude to dedicated staffs and operating sessions, incentives to staffs who agreed to embark on specialized training, promotions via the hospital's website, and encouragement of workshops for general physicians. Finally, robotic surgeons should try to have their regular trained team, to prepare second liners, and to compose the team different from institutional practices. For an institution, assistants are fellowship surgeons or residents and there is training program for assistants. Otherwise, for a private practice, a surgeon should do all surgical procedures, including ports placement, insertion of vaginal manipulator, and console work.

### The establishment of ASGRS

ASGRS consists of individual members with a professional interest in the study of robotic techniques in gynecologic surgery: clinicians or scientists or nurses. ASGRS strives for a wide representation of the scientific and medical communities first in Asia with fraternal engagement worldwide. ASGRS is a non-profit organization for the study of robotic techniques in gynecologic surgery aiming: to create an open Asian platform of individual professionals dedicated to the evolution and development of robotic surgery, to provide and develop standards and supervision for training and teaching in robotic surgery, to encourage evidence based practice in order to define indications, surgical techniques and scientific research, to promote exchange of results through local and international meetings, to collaborate with industrial organizations in order to encourage new developments, to promote communication with other relevant scientific organizations, and to improve women's surgical healthcare in Asia through the formation of a cooperative that openly shares and tracks clinical outcomes for research, process improvement and procedural development.

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## Conflict of interest

No potential conflict of interest relevant to this article was reported.

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