



**FALL 2017** 

## Note from the Editor

Dear SRS Members:

I am very excited to provide for you the latest updates from SRS.

A successful SRS Fellows Bootcamp was held earlier this year in Houston, TX and was led by Dr. Samantha Pfeifer. This issue highlights this wonderful event which received very positive feedback from both fellows and faculty.

Dr. Camran Nezhat's team has contributed a great article on the surgical management of endometriosis, and Dr. Hwang has provided a great update article on varicoceles and male fertility.

Thank you to all who have contributed to this newsletter! We will plan to have both a spring and fall newsletter. I will be reaching out to SRS members for contributions. Please provide any suggestions for material to cover in upcoming newsletters by e-mailing me at mchris21@jhmi.edu.

Another opportunity for SRS involvement is sharing your interesting cases on the SRS Listserv. I recently shared one of my challenging cases; and the responses were very thoughtful and helpful.

I urge everyone to take the time to contribute to the Listserv and the discussion on the SRS website. The SRS programs for the upcoming Congress in San Antonio are exciting; and I look forward to seeing you at ASRM 2017.

Best regards, Mindy S. Christianson, M.D.

## Message from SRS President, Dr. Ceana Nezhat

Dear Colleagues:

It has been an exciting five years serving the membership of the Society of Reproductive Surgeons. As the President of SRS, I had big shoes to fill and great expectations to match the standards of previous presidents. I could not be more pleased with the accomplishments of the SRS.

My vision and focus as President has been the revitalization of reproductive surgery among the members of the American Society for Reproductive Medicine (ASRM), by means of furthering educational opportunities and increasing membership activities. I am pleased to report we have taken great strides in both directions. The continuing education for the next generation of reproductive surgeons is of the upmost importance. We established an intensive didactic and hands-on surgical boot camp tailored to reproductive endocrinology fellows and junior faculty. Following the success of our first two SRS-SREI Boot Camps, we are working towards making the 2018 boot camp even better with plans to increase available spots to meet high demand.

The third annual SRS-SREI Boot Camp will be held again at Houston Methodist Institute for Technology, Innovation, & Education (MITIE), January 26-28, 2018. Additionally, the Society of Reproductive Surgeons, with tremendous support from the executive leadership of ASRM, has created and launched a new one-year intensive SRS/ASRM Fellowship in Minimally Invasive Reproductive Surgery. This fellowship will fill the need for further training in reproductive surgery among select graduating REI Fellows with an interest in advancing their surgical skills. The first cohort of Fellows will begin July 2018. In addition, under the editorial guidance of Dr. Jeff Goldberg, Dr. Jay Sandlow, and myself, the SRS Manual of Reproductive Surgery, whose authorship is made up entirely of SRS members, was submitted to Cambridge University Press this year, and will be available soon. The book is liberally illustrated and includes links to videos in the SRS video library directing traffic to our website.

Lastly, is the revival of a great debate by Dr. Alan DeCherney and Dr. David Adamson, recipients of the 2017 SRS Distinguished Surgeon Award at the ASRM Scientific Congress & Expo. The debate is titled "Reproductive Surgery is Obsolete in the Era of Current Advancements in IVF".

Continued on the following page

## **INSIDE this ISSUE**

SRS Website Update	2
SRS-SREI 2017 Surgical Boot Camp	3
Urology Corner   An Update On Varicocele Repair	4
Minimally Invasive Reproductive Surgery Fellowship Update	4
Update in Innovation: Surgical Management of Endometriosis	6
SRS Events at the ASRM Scientific 2017 Congress & Expo	9
Updates on www.reprodsurgery.org	10

## SRS Website Update: Dr. J. Preston Parry, M.D., M.P.H.

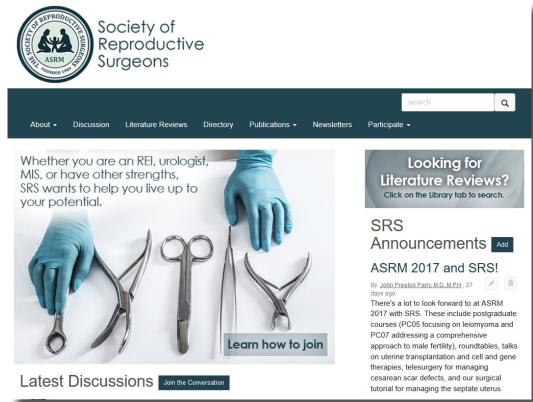
The SRS website team has made great strides updating the site over the past year. In addition to a modern layout, the new format highlights multiple opportunities to get more out of membership. These include several that are hidden until one logs in.

The discussion/blog section, championed by Dr. Bhagavath and Dr. Christianson, is now increasingly active. The goal of this section is to discuss management strategies for multiple surgical situations, particularly those more dependent on expert opinion and with more limited evidence-based medicine.

Literature reviews continue to address important issues in our field. We particularly appreciate the hard work by Dr. Estes, Dr. Christianson, Dr. Knudtson, and Dr. Rushing (and we're always looking for more contributors). Under the "About" tab is a link to a page describing SRS fellowship opportunities. This page is visible to nonmembers, and highlights the one-year post-graduate fellowship for REI's who wish to further advance

their minimally invasive surgical skills. We greatly appreciate Dr. Ceana Nezhat in Atlanta, GA, Dr. Camran Nezhat in Palo Alto, CA, and Dr. Charles Miller in Park Ridge, IL, for leading the way with the first three SRS fellowships.

Last but not least, this newsletter will be added to the newsletter tab, where archives of SRS's highlights will be recorded.



Though the website has come a long way, it wouldn't be where it is without Rusty Howell, Dani Mosley, and Julie Beckham constantly working behind the scenes. Moreover, much of the structure derives from Dr. Lindheim who started the reprodsurgery.org page and maintained it for years. With future videos and other opportunities being explored, though much has been done, far more is to come!

### Message from Dr. Nezhat, cont.

I believe the development of the SRS/SREI Boot Camp, SRS Fellowship, publication of an SRS surgical manual, and the new features at our annual meetings will attract Fellows and surgeons of all levels of experience, and ultimately enhance our society and our focus on reproductive surgery.

I must share credit for the accomplishments achieved during my tenure with my hard-working, innovative, and ardent SRS officers and committee members. Thank you, for dedicating your time and expertise. I also want to express my gratitude to the ASRM Board

of Directors, ASRM's visionary CEO, Dr. Richard Reindollar, outstanding Chief Scientific Officer, Susan Gitlin, as well as their exceptional support staff, particularly Deb Hanson, Susanna Scarbrough, Leslie Treece, Dani Mosley, Keith Ray and others, for their continued support and commitment to the SRS goals. Most of all, thank you to all SRS members for honoring me with the opportunity to serve on your board. It has indeed been a rewarding experience.

As I join our distinguished past presidents, I assure you I will remain strongly involved in moving SRS toward our goals. I go forward knowing that SRS will be under the brilliant directive of the upcoming president, Dr. Samantha Pfeiffer, along with the prestigious and avid board of SRS, as well as continued support and guidance of ASRM leadership. My hope for the future is to see the Society of Reproductive Surgeons continue the advancement of reproductive surgery serving our patients worldwide.

Regards, Ceana H. Nezhat, M.D., FACS, FACOG President, Society of Reproductive Surgeons, 2017

## **SRS-SREI 2017 Surgical Boot Camp**

## Surgical Boot Camp offers hands-on training for REI fellows

On January 27-28, 2017, the Society of Reproductive Surgeons (SRS) and the Society for Reproductive Endocrinology and Infertility (SREI) co-sponsored the second annual SRS/SREI Surgical Bootcamp, held at Houston Methodist Institute for Technology, Innovation & Education (MITIE) in Houston, TX. The Surgical Bootcamp included intensive two-day didactics and hands-on educational programs for 40 Fellows in Reproductive Endocrinology and Infertility (REI), and featured 14 expert faculty in gynecological and reproductive surgery, led by program chair, Dr. Samantha Pfeifer. Lectures, hands-on simulation, and cadaver model training were utilized to show various aspects, including tubal anastomoses, retroperitoneal dissection, knot tying, and advanced hysteroscopic techniques.

Dr. Pfeifer also provided the first of two keynote presentations, which addressed the role of the reproductive surgeon in REI. Dr. Antonio Gargiulo provided the second keynote on the topic of uterine transplant in the U.S. The didactic lectures were structured as micro-lectures featuring single, well-defined topics with key learning points that were reinforced in the hands-on lab sessions.

The first day of lectures featured topics on the role of robotics in reproductive surgery, port placement, anatomy of retroperitoneum, hysteroscopy, energy sources, principles of suturing, treatment of septate uteri, salpingostomy/ salpingectomy, adhesion prevention, minimally-invasive surgery in the obese patient, and embryo-transfer techniques.

The following day, the lectures were specific to topics on fertility-sparing endometriosis surgery, pain-reducing endometriosis surgery, managing ureteral and bladder injuries, ovarian/tubal pathology and ovarian reserve-sparing surgery, tubal anastomosis options, diagnosing double uteri, myomectomy, tissue extraction, fibroids, managing difficult cervix and intrauterine adhesions, and the experience and skill of the laparoscopic surgeon.

The two-day program also included two live cadaveric demonstrations, the first of which focused on pararectal, paravesicle, rectovaginal, vesicovaginal, and presacral spaces, as well as





Top: Under the guidance of experienced faculty members, Fellows gain hands-on training in the cadaver lab. Bottom left: Dr. Pres Parry instructs Fellows in the hysteroscopy hands-on session. Bottom right: Fellows practice transfer drills and observational skills with the embryo transfer simulators.

identification of the ureter. The second live cadaveric demonstration focused on energy sources that included monopolar/bi-polar, ultrasonic energy, laser, and plasma energy.

The event received positive feedback from participants. "I thought the course was fantastic — well run, organized, quality content and so valuable for REI fellows," said Dr. Linnea Goodman, a participant. "The staff were knowledgeable and attentive, and the program ran smoothly. The resources available, including cadavers, equipment, simulators, and novel innovations, were phenomenal and such a benefit for trainees."

Day one concluded with a networking dinner allowing the Fellows to personally connect with all the faculty members,



including SRS President, Dr. Ceana Nezhat.

"Interacting with the Fellows was so rewarding," remarked Dr. Steven Lindheim, a faculty member for the event. "To see them yearning for the latest and greatest information on techniques reinforces the need for continuing education; and being part of it was an honor. Working with the faculty and seeing how they perform techniques reinforce the unique skill set that all reproductive surgeons have. And sharing it among colleagues was a learning experience even for the seasoned veteran like myself."

The 2018 SRS/SREI Surgical Boot Camp will be held at MITIE, January 26-27, 2018.

## Urology Corner | An Update On Varicocele Repair

David Guo, M.D., Male Reproductive and Surgery Fellow Kathleen Hwang, M.D., Assistant Professor of Urology, Alpert Medical School of Brown University

#### Introduction

Varicoceles affect up to 15% of men; and up to 40% of men presenting for infertility will carry a diagnosis of varicocele. Fortunately, varicocele is one of the reversible causes of male infertility and is the most commonly performed surgical procedure for the treatment of male infertility. Therefore, the urologic community has been at the forefront of developing and refining techniques in varicocele repair.

#### Indications for Repair

In the infertile male population, the indication for varicocele repair is a clinically identifiable varicocele, which is graded I through III, with at least one impaired semen parameter.<sup>2</sup> There is no indication for repair for subclinical varicoceles (such as those found on ultrasound, but not on clinical exam) and varicoceles without semen abnormalities. In the adolescent population, varicocele repair may also be indicated for preservation of testicular function in boys

who experience an ipsilateral reduction in testicular size. The size discrepancy is not universally agreed upon; and some practitioners advocate operating when there is a 10-20% size discrepancy.<sup>3</sup>

In addition, varicocele repair may also be indicated for treatment of hypogonadism and in the setting of non-obstructive azoospermia (NOA).4 Varicoceles have been associated with lower testosterone levels due to presumed compromise of Leydia cell function; and varicocele repair has been demonstrated to significantly increase testosterone levels post-operatively.<sup>5,6</sup> In the NOA population, varicocele repair may increase the likelihood of both ejaculated sperm and successful sperm retrieval. A recent meta-analysis encompassing 468 patients with NOA showed that varicocelectomy was associated with a 2.65 better odds of finding sperm at retrieval compared to NOA patients without varicocelectomy. Furthermore, 44% of patients treated with varicocelectomy were able to produce

sperm in their ejaculate and avoid surgical sperm retrieval altogether.<sup>7</sup>

#### **Principles of Repair**

Varicoceles are a dilation of the pampinform plexus that is intimately intertwined with the testicular artery, providing drainage from the testicle. While the exact mechanism of spermatogenic impairment is unknown, one theory is that the increased temperature of the testicular microenvironment from the dilated vessels results in impairment.8 The general principle of varicocele repair is to ligate these dilated venous structures while preserving the arterial blood supply and lymphatic vessels. With this goal in mind, a variety of techniques, both surgical and radiologic, have been developed to address varicoceles.

The surgical considerations for varicocele repair are the site of surgery and

Continued on the following page

## Minimally Invasive Reproductive Surgery Fellowship Update

Dr. Jeffrey M. Goldberg, M.D.

SRS is excited to announce that it has established a one-year fellowship program in minimally invasive reproductive surgery. The enthusiasm of the REI fellows at the annual SRS Surgical Boot Camp and the favorable results of an online survey of current REI fellows regarding their desire to obtain surgical training after REI fellowship were the impetus to develop this program. It is essentially a one-year preceptorship with a high volume, master reproductive surgeon. The following are the current programs with others to be added as needed to meet the demand.

<u>Nezhat Medical Center,</u> Atlanta, GA, Program Director: Ceana Nezhat, M.D.

<u>Camran Nezhat Institute</u>, Palo Alto, CA, Program Director: Camran Nezhat, M.D.

<u>The Advanced Gynecologic Surgery Institute,</u> Park Ridge, IL, Program Director: Charles Miller, M.D.

The first fellows will begin in July 2018, and online applications are available on the SRS website. Preference will be given to graduating REI fellows but anyone who has completed an OB/GYN residency is eligible to apply. The program is not ACGME or ABOG

approved, but graduates of the program will receive a certificate of completion from SRS/ASRM. Research is strongly encouraged and supported, but not required.

There is good evidence-based data showing that reproductive surgery is more cost-effective than IVF in many cases, and is often preferred by patients as it is more "natural" than IVF. Reproductive surgery also is complimentary to IVF, as the surgical management of pelvic pathology can improve IVF results. It is unfortunate that most REIs have abandoned reproductive surgery or relegated it to general or minimally invasive gynecologic surgeons. Reproductive surgeons have a different skill set and approach to surgery, which could lead to improved outcomes. REIs who can operate are more "complete" physicians who can offer their patients all of the available treatment options. Since most REI fellows are not receiving adequate training in reproductive surgery, SRS has created this fellowship to provide them with the needed skills. It is our intention that graduates of the program will deliver excellent surgical care to their patients, and will serve to teach these skills to their trainees to benefit the next generation of patients. Hopefully, they also will become actively involved with SRS to assure the future of reproductive surgery.

#### **Urology Corner, cont.**

technique. Varicocelectomy may be conducted via the abdominal, retroperitoneal, inguinal or subinguinal approach. Likewise, multiple techniques may be employed, including open (with or without magnification), laparoscopic, robotic, or percutaneous embolization. When selecting the approach, it is important to consider surgeon experience, published outcomes and side effects of each approach. The complications of varicocele repair are post-operative pain, hydrocele formation, varicocele recurrence, and testicular atrophy.

#### **Types of Repair**

The gold standard procedure is the microscopic open varicocelectomy, as it has the highest success rate and lowest complication and recurrence rate. This may be performed at an inguinal or subinguinal site, with subinguinal varicocelectomy shown to cause less intraoperative pain, possibly due to preservation of the aponeurotic sheath of the external oblique. A metanalysis by Cayan et al showed that microscopic varicocelectomy had a 41.97% spontaneous pregnancy rate, compared to 30.07% laparoscopically and 33.2% with percutaneous embolization.<sup>10</sup> The post-operative hydrocele rate of the microscopic approach was 0.44%, compared to 2.84% via the laparoscopic approach; the recurrence rate of 1.05% compared to 4.3% laparoscopically and 12.7% with percutaneous embolization.

When comparing complications based on level of magnification, either with the microscope, the surgical loupe, or the unassisted eye, Cayan et al showed in an adolescent cohort that the surgical microscope resulted in the lowest complication rate: hydrocele formation and varicocele recurrence were each 0% with the microscope, compared to surgical loupe (2.9%, 2.9%) or unassisted eye (5.9%, 8.8%).11

Laparoscopic varicocelectomy is normally carried out using an umbilical port site for the camera and two additional abdominal port sites for instruments. Some surgeons ligate the testicular artery along with the vein, as this has shown a decreased recurrence rate (2.1% v. 5.5%), but also has an increased risk of hydrocele formation (17.6% v. 4.3%) and raises the risk of testicular atrophy because the testicle must depend solely on collateral flow via the artery of the vas deferens. 12 This procedure carries inherent risks of laparoscopic transperitoneal surgery, including injury to viscous and vascular structures.

Percutaneous varicocele embolization is a minimally invasive approach performed by interventional radiologists. The approach is either via the common femoral or internal jugular vein, and either coil, plug or sclerosing agent is applied at the pampiniform plexus.13 The advantages are that this procedure may be done under conscious sedation, decreased post-operative pain relative to surgery, and decreased risk of hydrocele formation. The main disadvantages are failed treatment (13.05%) and increased recurrence rate relative to surgery (12.7%), and additionally the increased radiation exposure.10

With the widespread adoption of robotic techniques in other areas of urology, the robotic subinguinal varicocelectomy has been described.14 In this approach, the spermatic cord is identified and elevated into the field via an inguinal or subinguinal approach, and the robotic platform is brought over the spermatic cord to begin dissection. The potential benefits are the magnification of vision in the robotic console, precise and steady movement facilitated by the robotic platform, and the ability to pause throughout the procedure while leaving all instruments in the same position. Preliminary outcomes for 238 patients showed improvement of semen parameters in 76% of patients with oligospermia.15

#### Conclusion

A variety of surgical and non-surgical approaches and techniques may be employed to address varicoceles, and these continue to evolve. The gold standard remains the microscopic varicocelectomy via the subinguinal or inguinal approach, as this has the highest success rate and lowest recurrence and complication rates.

#### References

- Clarke BG. Incidence of varicocele in normal men and among men of different ages. JAMA. 1966;198(10):1121-1122. http://www. ncbi.nlm.nih.gov/pubmed/5953394. Accessed September 25, 2017.
- Sharlip ID, Jarow JP, Belker AM, et al. Best practice policies for male infertility. Fertil Steril. 2002;77(5):873-882. http://www.ncbi.nlm.nih.gov/ pubmed/12009338. Accessed September 25, 2017.
- 3. Kolon TF. Evaluation and Management of the Adolescent Varicocele. *J Urol.* 2015;194(5):1194-1201. doi:10.1016/j.juro.2015.06.079.
- 4. Schlegel PN, Goldstein M. Alternate indications for varicocele repair: non-obstructive azoospermia, pain, androgen deficiency and progressive

- testicular dysfunction. Fertil Steril. 2011;96(6):1288-1293. doi:10.1016/J. FERTNSTERT.2011.10.033.
- Hayden RP, Tanrikut C. Testosterone and Varicocele. Urol Clin North Am. 2016;43(2):223-232. doi:10.1016/j. ucl.2016.01.009.
- Hsiao W, Rosoff JS, Pale JR, Powell JL, Goldstein M. Varicocelectomy Is Associated With Increases in Serum Testosterone Independent of Clinical Grade. *Urology*. 2013;81(6):1213-1218. doi:10.1016/j.urology.2013.01.060.
- Esteves S, Miyaoka R, Roque M, Agarwal A. Outcome of varicocele repair in men with nonobstructive azoospermia: systematic review and meta-analysis. Asian J Androl. 2016;18(2):246. doi:10.4103/1008-682X.169562.
- Goldstein M, Eid JF. Elevation of intratesticular and scrotal skin surface temperature in men with varicocele. J Urol. 1989;142(3):743-745. http://www. ncbi.nlm.nih.gov/pubmed/2769853. Accessed September 27, 2017.
- Gontero P, Pretti G, Fontana F, Zitella A, Marchioro G, Frea B. Inguinal versus subinguinal varicocele vein ligation using magnifying loupe under local anesthesia: Which technique is preferable in clinical practice? *Urology*. 2005;66(5):1075-1079. doi:10.1016/j.urology.2005.05.009.
- Cayan S, Shavakhabov S, Kadioglu A. Treatment of Palpable Varicocele in Infertile Men: A Meta-analysis to Define the Best Technique. J Androl. 2008;30(1):33-40. doi:10.2164/ jandrol.108.005967.
- Cayan S, Acar D, Ulger S, Akbay

   E. Adolescent varicocele repair:
   long-term results and comparison
   of surgical techniques according to
   optical magnification use in 100 cases
   at a single university hospital. *J Urol*.
   2005;174(5):2003-6-7. doi:10.1097/01.
   ju.0000176488.44895.7b.
- 12. ESPOSITO C, VALLA JS, NAJMALDIN A, et al. Incidence and Management of Hydrocele Following Varicocele Surgery in Children. J Urol. 2004;171(3):1271-1273. doi:10.1097/01. ju.0000112928.91319.fe.
- 13. Johnson D, Sandlow J. Treatment of varicoceles: techniques and outcomes. Fertil Steril. 2017;108(3):378-384. doi:10.1016/j. fertnstert.2017.07.020.
- 14. Shu T, Taghechian S, Wang R. Initial experience with robot-assisted varicocelectomy. Asian J Androl. 2008;10(1):146-148. doi:10.1111/j.1745-7262.2008.00354.x.
- Gudeloglu A, Brahmbhatt J V, Parekattil SJ. Robot-assisted microsurgery in male infertility and andrology. *Urol Clin North* Am. 2014;41(4):559-566. doi:10.1016/j. ucl.2014.07.010.

## Update in Innovation: Surgical Management of Endometriosis

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Endometriosis is one of the most common gynecologic disorders, affecting approximately 10% of all reproductive-aged women and 35-50% of women with pelvic pain and infertility<sup>1,2.</sup> A chronic, progressive, and estrogen-dependent disease, endometriosis can cause pain, infertility, and organ dysfunction. Patients require a thorough evaluation with attention to their individual treatment goals; and many patients can be managed medically. However, when medical management fails or is not indicated, surgical treatment may be recommended.

Surgical treatments depend on the location of disease, symptoms, age, and childbearing status. In very young patients who have not yet started childbearing, we recommend conservative management. Adolescent patients are more likely to present with atypical symptoms and, as a result, experience a delay in diagnosis. In these patients, we begin with medical management followed by videolaparoscopic surgery and postoperative long-term suppressive hormonal therapy<sup>3</sup>. Diagnostic and operative videolaparoscopy with or without robotic assistance for treatment of endometriosis and lysis of adhesions is performed with the goal of removing all endometriotic implants and restoration of normal anatomy<sup>4</sup>.

Patients in their reproductive years with pain and/or infertility and normal male factor may benefit from surgical management. In experienced hands, restoration of anatomy without compromising ovarian function results in excellent pain relief and better postoperative pregnancy rates than IVF, even benefits in patients with previously failed IVF treatments<sup>5,6</sup>. Studies have shown by decreasing inflammation in the pelvis and the associated toxicity

to embryos, uterine receptivity can be improved by thorough treatment of endometriosis<sup>7</sup>.

In the case of endometriomas, we recommend embryo or gamete freezing prior to surgical intervention since surgical treatment of endometriomas can reduce ovarian reserve<sup>4,5,8-10</sup>. We caution against drainage and/or irrigation of endometriomas since blood can continue to leak into the peritoneal cavity, causing extensive pelvic inflammation and adhesion formation and resulting in decreased future fecundibility (please see figures 1 through 4 below). It is extremely diffcult to thoroughly irrigate endometriomas, even with a double lumen needle. Thus, we recommend avoiding endometriomas entirely during egg retrieval. These patients may receive

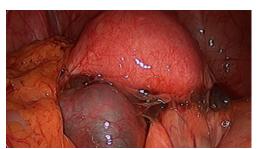


Figure 1. A large endometrioma that has been slowly leaking after egg retrieval, forming extensive adhesions between the bowel, ureters, uterus, bilateral fallopian tubes, and bilateral ovaries.

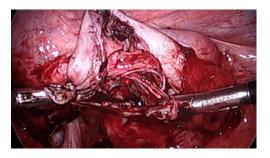


Figure 2. Removal of the entire cyst wall of an endometrioma is necessary to prevent recurrence.

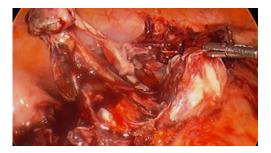


Figure 3. In this image, you can see the right ovary densely adhered to the bowel. The left ovarian endometrioma has been partially resected, with visible adhesions to both bowel and bladder.



Figure 4. In this image, the left ovarian endometrioma has been resected and is being elevated off the bowel, with the right endometrioma still visible.

two to three months of GnRH suppressive therapy, followed by removal of the entire cyst wall with attention to sparing all healthy ovarian tissue? In some cases, the degree of induration and adhesion formation may be so extensive as to necessitate the involvement of specialists such as colorectal surgeons and/or urologists to assist in the dissection. These patients also are at an extremely high risk of ovarian remnant syndrome.

Endometriomas are classified into two types: Type I endometriomas arise from the invagination of endometrial implants on the surface of the ovary and then hemorrhage into the cyst, while Type II

#### Continued on the following page

## Surgical Management of Endometriosis, cont.

endometriomas arise from the invasion of implants into corpus luteum cysts. The surgical management of the types differs. Type I endometriomas are diffcult to remove due to densely adherent fibrous capsules while the diffculty in removing Type II endometriomas correlates with the degree of invasion, with Type IIA being the easiest to remove and Type IIC being as challenging as Type IIO.

Likewise, in an attempt to minimize inflammation in the pelvis, we recommend conservative management of bowel endometriosis and deferring bowel resection, if possible, until after childbearing is complete 11-16. Furthermore, patients who achieve pregnancy postoperatively can experience disease regression and potentially no longer require bowel resection postpartum. In patients who require surgical treatment of bowel endometriosis, we preferentially

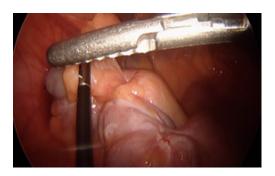


Figure 5. Bowel endometriosis along the ileocecal iunction<sup>16</sup>.

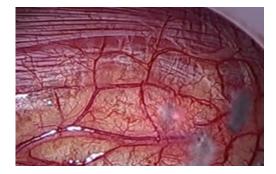


Figure 8. Diaphragmatic endometriosis lesions as seen via VATS.

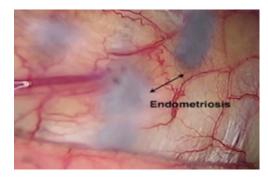


Figure 9. Pleural endometriosis implants as seen via VATS.

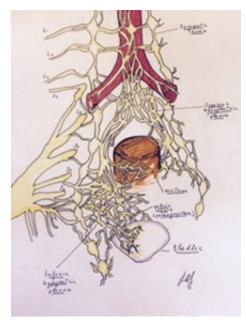


Figure 10. The nervous plexus, illustrating the complex innervation of the pelvis.

perform rectal shaving as opposed to disc or seamental resection in order to minimize the risk of complications associated with segmental bowel resection<sup>17-21</sup>. Patients with bowel stricture may require resection, but we avoid resection near the rectum if possible due to the high risk of injury to the pelvic nerves immediately adjacent to the rectum. Lesions involving the small bowel may be easily resected without significant complications, but resection of lesions at the level of the low rectum requires extensive retro-rectal dissection. Aggressive dissection at this level risks injury to extensive vascularity, pelvic splanchnic nerves, and the superior and inferior hypogastric plexi, as well as other nerves like the iliofemoral, ilioinguinal, and iliohypogastric nerves, depending on location and extent of disease<sup>16,22</sup>. Complications of these injuries include bowel stenosis, incontinence, ischemia resulting in fistula formation, severe constipation, and urinary retention<sup>23,24</sup>.

Nerve-sparing techniques for deeply infiltrating endometriosis are therefore recommended in order to avoid injury to the nervous plexus and to preserve bowel, bladder, and sexual function<sup>16,25-27</sup>.

In cases of genitourinary endometriosis, surgeons should be prepared to perform ureterolysis in cases of ureteral stricture with or without hydronephrosis, as this can treat up to 90% of cases<sup>28,29</sup>. Preoperative planning is necessary in these patients to identify renal compromise secondary to ureteral stricture, as ureteral endometriosis is a known cause of silent renal loss<sup>30</sup>. Ureteral endometriosis is classified as either an intrinsic disease, which involves the ureteral wall and/or mucosa, or an extrinsic disease, which compresses the

ureter externally, causing stricture and hydronephrosis. In cases with extensive genitourinary involvement, consultation with an experienced urologist is recommended, as these patients may require ureteral reanastamosis or reimplantation. In patients with refractory bladder lesions, videolaparoscopic segmental bladder resection with or without robotic assistance may be needed, and has favorable results in terms of symptom relief, progression of disease, and recurrence risk<sup>29</sup>.

Older patients who have completed childbearing may be managed more aggressively, depending on symptoms and disease severity, if all else fails. These patients may need to undergo hysterectomy and/or bilateral salpingooophorectomy with thorough elimination of endometriosis. Thoracic endometriosis patients, however, are often best treated as conservatively as possible, starting with medical management, then with laparoscopic treatment of all visible lesions, followed by hormonal suppression and later by thoracoscopic treatment of pulmonary lesions or diaphragmatic resection<sup>31,32</sup>. Hysterectomy with bilateral salpingo-oophorectomy should be considered as a last resort. Although we have never encountered phrenic nerve injury during treatment of thoracic endometriosis syndrome in any of our patients, the possibility of this rare complication exists, and in the case of phrenic nerve injury the problem created can be worse than the original disease<sup>33</sup>. In treatment of endometriosis, it should be remembered that injury to the surrounding viscera or neurovascular structures can result in complications worse than the original disease.

Endometriosis is primarily a disease of inflammation, with all of its complications, including induration, hyperemia, fibrosis, and necrosis. Resection of endometriotic lesions brings about improvements in pelvic pain and infertility, but also decreases the risk of malignant transformation into ovarian cancer<sup>34</sup>. The most effective treatment, with the best cancer prevention, is complete elimination of all endometriotic lesions, even in patients who are asymptomatic. Patients who have completed childbearing at the time of their surgery also may be offered risk-reducing bilateral salpingectomy to further reduce the risk of developing high grade serous ovarian carcinoma<sup>35</sup>.

In all patients requiring surgical management of endometriosis, the treatment should be tailored to the

Continued on the following page

## Surgical Management of Endometriosis, cont.

patient's age, extent of disease, and childbearing status. Attention should be paid to removing all endometriotic lesions without removing or injuring normal tissue. Removal of normal peritoneum in an effort to remove microscopic implants can be associated with significant complications. We do not recommend removal of all normal tissue and peritoneum, as the benefits have not been proven and are questionable. It should be remembered, however, that the success of treatment is more dependent on the skill and expertise of the surgeon in thoroughly treating all disease than on the methods or instrumentation used<sup>36</sup>. We recommend multidisciplinary management of complicated extragenital endometriosis, starting with medical management and proceeding to conservative surgical measures prior to aggressive surgical peritoneal stripping that may carry a high risk of complications and adhesion formation.

#### **Bibliography**

- Nezhat, C., Nezhat, F.R. & Nezhat, C. Nezhat's Operative Gynecologic Laparoscopy and Hysteroscopy, (Cambridge University Press, Cambridge; New York, 2008).
- 2. Giudice, L.C. Clinical Practice. Endometriosis. N Engl J Med 362, 2389-2398 (2010).
- Dun, E.C., et al. Endometriosis in Adolescents. *JSLS* 19(2015).
- Nezhat C, B.E., Paka C, Nezhat C, Nezhat F. Nezhat's Video-Assisted and Robotic-Assisted Laparoscopy and Hysteroscopy, (Cambridge University Press, United States of America, 2013).
- Littman, E., et al. Role of Laparoscopic Treatment of Endometriosis in Patients with Failed in Vitro Fertilization Cycles. Fertil Steril 84, 1574-1578 (2005).
- Soriano, D., et al. Fertility Outcome of Laparoscopic Treatment in Patients with Severe Endometriosis and Repeated in Vitro Fertilization Failures. Fertil Steril 106, 1264-1269 (2016).
- Giudice, L.C. & Kao, L.C. Endometriosis. Lancet 364, 1789-1799 (2004).
- Sampson, J. Perforating Hemorrhagic (Chocolate) Cysts of the Ovary. Their Importance and Especially Their Relationship to Pelvic Adenoma of Endometrial Type

- ("Adenomyoma" of the Uterus, Rectovaginal Septum, Sigmoid, Etc). Arch Surg 3, 245-323 (1921).
- Lewis, M., Baker, V. & Nezhat, C. The Impact on Ovarian Reserve after Laparoscopic Ovarian Cystectomy Versus Three-Stage Management in Patients with Endometriomas: A Prospective Randomized Study. Fertil Steril 94, e81-82; author reply e83 (2010).
- Falik, R., et al. Endometriomas: Classification and Surgical Management. OBG Management 29 (2017).
- Fedele, L., Bianchi, S., Zanconato, G., Portuese, A. & Raffaelli, R. Use of a Levonorgestrel-Releasing Intrauterine Device in the Treatment of Rectovaginal Endometriosis. Fertil Steril 75, 485-488 (2001).
- Vercellini, P., et al. Treatment of Symptomatic Rectovaginal Endometriosis with an Estrogen-Progestogen Combination Versus Low-Dose Norethindrone Acetate. Fertil Steril 84, 1375-1387 (2005).
- Koninckx, P.R., Ussia, A., Adamyan, L., Wattiez, A. & Donnez, J. Deep Endometriosis: Definition, Diagnosis, and Treatment. Fertil Steril 98, 564-571 (2012).
- Donnez, J., et al. Deep Rectovaginal Endometriotic Nodules: Perioperative Complications from a Series of 3,298 Patients Operated on by the Shaving Technique. Gynecological Surgery 10, 31-40 (2013).
- Abrão, M.S., et al. Deep Endometriosis Infiltrating the Recto-Sigmoid: Critical Factors to Consider before Management. Human Reproduction Update 21, 329-339 (2015).
- Nezhat, C., et al. Bowel Endometriosis: Diagnosis and Management. AJOG In Press. (2017).
- Mohr, C., Nezhat, F.R., Nezhat, C.H., Seidman, D.S. & Nezhat, C.R. Fertility Considerations in Laparoscopic Treatment of Infiltrative Bowel Endometriosis. JSLS 9, 16-24 (2005).
- Darai, E., Ackerman, G., Bazot, M., Rouzier, R. & Dubernard, G. Laparoscopic Segmental Colorectal Resection for Endometriosis: Limits and Complications. Surg Endosc 21,1572-1577 (2007).
- Landi, S., et al. Laparoscopic Disk Resection for Bowel Endometriosis Using a Circular Stapler and a New Endoscopic Method to Control Postoperative Bleeding from the Stapler Line. J Am Coll Surg 207, 205-209 (2008).
- Fanfani, F., et al. Discoid or Segmental Rectosigmoid Resection for Deep Infiltrating Endometriosis: A Case-Control Study. Fertil Steril 94, 444-449 (2010).
- Roman, H., et al. Rectal Shaving for Deep Endometriosis Infiltrating the Rectum: A 5- Year Continuous Retrospective Series. Fertil Steril 106, 1438-1445 e1432 (2016).
- Lemos, N., et al. Laparoscopic Anatomy of the Autonomic Nerves of the Pelvis and the Concept of Nerve-Sparing Surgery by Direct Visualization of Autonomic Nerve Bundles.

- Fertil Steril 104, e11-12 (2015).
- Roman, H., et al. Long-Term Functional Outcomes Following Colorectal Resection Versus Shaving for Rectal Endometriosis. Am J Obstet Gynecol 215, 762 e761-762 e769 (2016).
- Soto, E., Catenacci, M., Bedient, C., Jelovsek, J.E. & Falcone, T. Assessment of Long-Term Bowel Symptoms after Segmental Resection of Deeply Infiltrating Endometriosis: A Matched Cohort Study. J Minim Invasive Gynecol 23, 753-759 (2016).
- Possover, M., Quakernack, J. & Chiantera, V. The Lann Technique to Reduce Postoperative Functional Morbidity in Laparoscopic Radical Pelvic Surgery. J Am Coll Surg 201, 913-917 (2005).
- Ceccaroni, M., et al. Nerve-Sparing Laparoscopic Eradication of Deep Endometriosis with Segmental Rectal and Parametrial Resection: The Negrar Method. A Single-Center, Prospective, Clinical Trial. Surgical Endoscopy and Other Interventional Techniques 26, 2029-2045 (2012).
- Darwish, B. & Roman, H. Surgical Treatment of Deep Infiltrating Rectal Endometriosis: In Favor of Less Aggressive Surgery. Am J Obstet Gynecol 215, 195-200 (2016).
- Bosev, D., et al. Laparoscopic Management of Ureteral Endometriosis: The Stanford University Hospital Experience with 96 Consecutive Cases. J Urol 182, 2748-2752 (2009).
- Nezhat, C., Falik, R., McKinney, S. & King, L. Pathophysiology and Management of Urinary Tract Endometriosis. Nature Reviews Urology 14, 359-372 (2017).
- Nezhat, C., Paka, C., Gomaa, M. & Schipper, E. Silent Loss of Kidney Secondary to Ureteral Endometriosis. JSLS 16, 451-455 (2012).
- Nezhat, C., Seidman, D.S., Nezhat, F. & Nezhat, C. Laparoscopic Surgical Management of Diaphragmatic Endometriosis. Fertil Steril 69, 1048-1055 (1998).
- Nezhat, C., et al. Endometriosis of the Diaphragm: Four Cases Treated with a Combination of Laparoscopy and Thoracoscopy. J Minim Invasive Gynecol 16, 573-580 (2009).
- Veeraswamy, A., et al. Extragenital Endometriosis. Clin Obstet Gynecol 53, 449-466 (2010).
- Nezhat, F.R., Apostol, R., Nezhat, C. & Pejovic, T. New Insights in the Pathophysiology of Ovarian Cancer and Implications for Screening and Prevention. Am J Obstet Gynecol 213, 262-267 (2015).
- Nezhat, F.R., Pejovic, T., Reis, F.M. & Guo, S.W. The Link between Endometriosis and Ovarian Cancer: Clinical Implications. Int J Gynecol Cancer 24, 623-628 (2014)
- Nezhat, C.R., Stevens, A., Balassiano, E. & Soliemannjad, R. Robotic-Assisted Laparoscopy Vs Conventional Laparoscopy for the Treatment of Advanced Stage Endometriosis. J Minim Invasive Gynecol 22, 40-44 (2015).

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# Join Us at the ASRM Scientific Congress & Expo October 28 - November 1, 2017

#### SRS Scientific Congress

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Day	Time	Activity type	Name		
Tuesday, October 31, 2017	9:30 a.m 10:15 a.m.	Plenary	Camran Nezhat, M.D. Lectureship in Innovations in Medicine Lecture: Cell and Gene Therapies in Reproductive Medicine		
Wednesday, November 1, 2017	9:45 a.m 10:30 a.m.	Plenary	Plenary: SRS Lecture: Uterine Transplantation: Lessons Learned		
Wednesday, November 1, 2017	11:00 a.m 12:30 p.m.	Telesurgery	Resection of Cesarean Section Scar by Hysteroscopic and Laparoscopic Approaches		
Wednesday, November 1, 2017	1:30 p.m 2:30 p.m.	Surgical Tutorial	Surgical Tutorial: Surgical Treatment of Septate Uterus		
Wednesday, November 1, 2017	3:30 p.m. – 5:00 p.m.	Symposium	Reproductive Surgery Symposium: Uterine Transplant: Technical and Ethical Issues		

#### **SRS** Roundtables

Day	Number	Name	Speaker
Monday, October 30, 2017	RTM41	Adenomyosis: Surgical Correction	Keith Isaacson, M.D.
Monday, October 30, 2017	RTM42	Vasectomy Reversal: Tips and Tricks	Sheldon Marks, M.D.
Monday, October 30, 2017	RTM43	Management of Severe Symptomatic Endometriosis	Ceana Nezhat, M.D.
Tuesday, October 31, 2017	RTT41	Klinefelter Syndrome	Kelly Chiles, M.D.
Tuesday, October 31, 2017	RTT42	Hysteroscopic Treatment of Asherman Syndrome: Surgical Pearls	Steven R. Lindheim, M.D.
Tuesday, October 31, 2017	RTT43	Endometriosis: When to Operate	Salli Tazuke, M.D.
Wednesday, November 1, 2017	RTW30	How to Get a Large Fibroid Out of a Small Incision	Stephanie J. Estes, M.D.
Wednesday, November 1, 2017	RTW31	Laparoscopic Myomectomy for the Reproductive Surgeon: When and How	Anthony Imudia, M.D.
Wednesday, November 1, 2017	RTW32	Indications for Varicocele Repair	Cigdem Tanrikut, M.D.

#### SRS Pre-Congress Program

Day	Time	Number	Name
Saturday, October 28, 2017	8:15 a.m 5:00 p.m.	PC05	Leiomyomas: Pregnancy Loss, Health Disparities, and Therapeutic Options
Saturday, October 28, 2017	8:15 a.m 5:00 p.m.	PC07	Interprofessional Approach to Comprehensively Manage Your Male Clients' Needs: From Sexual Dysfunction and Poor Semen Quality to Genetic, Psychological, and Aging Issues

#### SRS Events

Day	Time	Event
Monday, October 30, 2017	6:15pm - 8:00pm	SRS Members' Meeting, Debate, and Reception
		Grand Hyatt, Headquarters Hotel – Travis A/B

## New updates on www.reprodsurgery.org!



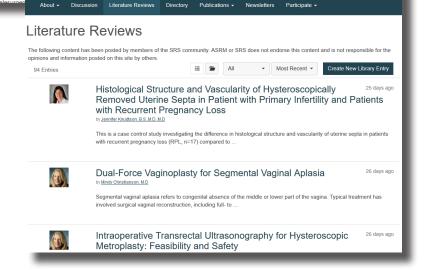
The SRS website,
www.reprodsurgery.org,
now hosts a variety of
informative features and
sections ONLY available to
active SRS members!

The new update includes a password protected log-in section that includes the following information:

- SRS Email Discussion List
- SRS Literature Reviews
- SRS Newsletters
- Surgical Tutorials uploaded by SRS members

Please be sure to keep checking the SRS website frequently to see the upcoming and ongoing changes. We value your input and suggestions.

Feel free to contact the Website Chair, Dr. John Parry (drprestonparry@gmail.com), or Dani Mosley at ASRM (dmosley@asrm.org) with any comments or suggestions you may have regarding the SRS website.



### Welcome New Members!

## Benefits of SRS membership include:

- NEW! Secure access to SRS newsletters, literature reviews, surgical videos from SRS members, and the SRS Discussion Board! These benefits are only available to active SRS members.
- Involvement in the only society that specifically addresses the issues of pelvic reconstructive surgery in women of reproductive age
- Interaction with a national and international group of surgeons who share an interest in reproductive surgery
- The opportunity to review research abstracts with a focus on reproductive surgery

- Participation in roundtable discussions at ASRM Scientific Congresses
- The discussions of novel surgical techniques through video sessions
- Participation in surgical hands-on courses at ASRM Annual Meetings
- Access to participate in Pre-Congress courses on a variety of topics related to the field of reproductive surgery
- Participation in collaborative research projects addressing surgical outcomes

## SRS 2017 Members' Meeting and Debate

## **Preliminary Schedule:**

October 30, 2017

6:15 - 6:45 pm - Cocktails & Hors d'oeurves

6:30 pm - Business Meeting - Led by Dr. Ceana Nezhat and SRS Board

6:45-7:15 pm - Debate titled, "Reproductive Surgery is Obsolete in the Era of Current Advancements in IVF"

7:15 - 7:25 pm - Presentation of SRS Distinguished Surgeon awards. Presented by Dr. Ceana Nezhat

7:25 - 7:30 pm - **Passing the Gavel: Upcoming President** Presented by current president, Dr. Ceana

Nezhat to incoming president, Dr. Samantha Pfeifer

7:30 - 8:00 pm - Mix & Mingle: Cocktails & Hors d'oeurvres

### **GREAT DEBATE**

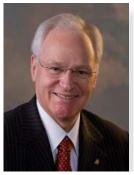
Resolve: "Reproductive Surgery is Obsolete in the Era of Current Advancements in IVF"

Description: Worldwide, ART has increasingly replaced reproductive surgery for the treatment of infertility. Whether or not this switch in clinical practice is due to cost-effectiveness, lack of surgical expertise, faster results, or fewer procedure-related complications is unclear. The aim of this debate is to hear about both approaches to infertility, ART, and reproductive surgery, from two experts in the field of reproductive medicine and IVF.



Con Alan H. DeCherney, M.D.

Dr. DeCherney is currently head of the program in Reproductive and Adult Endocrinology/Reproductive Biology and Medicine branch of the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) of the National Institutes of Health. He is a former Editor-in-Chief of *Fertility and Sterility*.



Pro G. David Adamson, M.D., FRCSC, FACOG, FACS

Dr. Adamson is founder and director of Fertility Physicians of Northern California in Palo Alto and San Jose. He is former president of ASRM.

Participation is free of charge.