Cornell Microsurgical Research and Training Program

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Introduction

The Cornell Microsurgical Research and Training program is part of the Center for Male Reproductive Medicine and Microsurgery in the Cornell Institute for Reproductive Medicine, and James Buchanan Brady Foundation Urologic Foundation, Department of Urology, and The New York Presbyterian Hospital-Weill Medical College of Cornell University.

The mission of the Center for Male Reproductive Medicine and Microsurgery is to provide state-of-art compassionate care for the infertile male. To advance this goal, the center carries out basic and clinical research in male reproduction, trains residents and fellows and provides educational programs for professionals as well as the public.

History of the Center for Reproductive Medicine and Microsurgery

Our center was originally founded by its director, Dr. Marc Goldstein, Professor of Urology and Reproductive Medicine, at the New York Presbyterian Hospital-Weill Medical College of Cornell University and the Center for Biomedical Research of the Population Council at the campus of the Rockefeller University in 1982.

It was the first university center in the United States to be devoted exclusively to male infertility treatment and research. It was also the first to join with the IVF program at the same university campus to provide coordinated, collaborative care for the infertile couple. The Center for Male Reproductive Medicine and Microsurgery has cared for over 7,000 infertile couples for whom a significant or exclusively male factor contributed to their fertility problem.

In the past five-years, few fields in modern medicine have changed as dramatically as reproductive medicine, especially for the new treatment of male infertility. With the leadership of its Director, Dr. Marc Goldstein, over 85% of microsurgical procedures for the innovative treatment of male infertility were first developed, or modified and introduced here at Cornell. T*hose important and innovative microsurgical procedures are Mini-incision Microsurgical Inguinal and Subinguinal Varicocelectomy; Microsurgical Vasectomy Reversal with the Microdot Method for Precision Suture Placement; Microsurgical Vasoepididymostomy with Triangulation end-to-side technique; Microsurgical Epididymal Aspiration (MESA) with ICSI; Microdissection Sperm Retrieval in Non-obstructive Azoospermia (TESE), and No-scalpel Vasectomy.*

With many years of hard work, our Center for Male Reproductive Medicine and Microsurgery at Cornell has been playing an extremely important role in developing various new microsurgical techniques. The center has also gained a great reputation for leading and establishing a higher standard for today's male infertility treatment worldwide. Our center has also provided the comprehensive guidelines for new management of men

with non-obstructive and obstructive azoospermia. In addition, the Center for Male Reproductive Medicine and Microsurgery at Cornell has achieved several of the highest reported success rates in the world for the microsurgical treatment of male infertility. Previously, only men with obstructive azoospermia were possible candidates for treatment, either through microsurgical reconstruction or microsurgical sperm aspiration. Now however, men with non-obstructive azoospermia (NOA) are even able to achieve pregnancies without having to resort to donor sperm. We have recognized that the key to success in today's microsurgical treatment for male infertility is to maximally invest our basic microsurgical training and research. The Center has trained over 20 fellows in male reproduction and provides a special training program for international physicians in microsurgery and male reproduction. In addition, hundreds of domestic and international fellows, residents, medical students, visiting fellows and physicians have been trained at our microsurgical program.

To share our successful experience with others, we have procured and developed a complete set of educational microsurgical training videos to standardize the quality for each microsurgical procedure for the treatment of male infertility. Many of these educational videos produced and developed at Cornell have received several of the highest awards from the American Society for Reproductive Medicine (ASRM) and American Urologic Association (AUA), for their clarity and their educational and scientific content. The videos are:

- Microsurgical Vasovasostomy: The Microdot Method of Precision Suture Placement (1996)
- No-Scalpel Vasectomy: with a step-by-step instruction (1996)
- Mini-incision Microsurgical Subinguinal Varicocelectomy with Delivery of the Testis (1995)
- Microsurgical Epididymal Sperm Aspiration with ICSI (1996)
- Creation of A Hypospadias Dog Model and Microsurgical Hypospadias Reconstruction Using A Tubularized Mucosal Graft (1996)
- The Autogenous Sperm Reservoir (1995)
- Interviews on Male Infertility with ABC, CBS, NBC and others. (1996)
- The State-of-the-art lectures of Male and Female infertility Treatment. (1996)
- Triangulation End-to-side Microsurgical Vasoepididymostomy (1998)
- Microdissection TESE: Sperm Retrieval in Non-obstructive Azoospermia (1998)

While many have expressed appreciation for these videos and other educational and training materials we have produced, physicians from outside of Cornell are still not able to learn these microsurgical techniques simply by viewing a video, slides and reading our articles, or attending our lectures. Therefore, male infertility specialists have come to recognize that successful microsurgical technique requires a high quality and comprehensive hands-on training program***. Step-by-step and hands on training, in a laboratory environment, are the only efficient means of truly mastering these challenging microsurgical techniques.*** Once the fundamental microsurgical skills are mastered an entirely new and exciting world of microsurgery is made possible.

Since the treatment of male infertility has developed so quickly, we expect more and more physicians worldwide to welcome the opportunity to come to our Center at Cornell to attend our microsurgical training course for male infertility treatment.

Basic Structure of the Program

Three levels of training are available

- Basic and advanced microsurgical training
- Experimental microsurgical research
- Observation of clinical microsurgery

Basic Microsurgical Courses

1. *Basic preparation for learning microsurgery* (2 to 5 hours)

- Microsurgical equipment set-up
- Familiarity with operating microscope and loupes
- Microsurgical instrument care
- Handling microsurgical sutures and instruments
- Review of male infertility microsurgical videos

2. *Basic Microsurgical technique* (10 to 40 hours)

- Learning to handle microsurgical instruments

    1. Hand position when holding instruments
    2. Control of hand tremor
    3. Use of the microsurgical needle holder and forceps
    4. Needle-holding position (Forehand or Backhand)

- Basic suturing technique with a practice card

    1. Passing the needle through tissue
    2. Tying a microsurgical knot

- Learning to use Silicone tubing for end-to-end anastomosis with microdot technique
- Developing basic microsurgical suturing techniques for both hands

Advanced Microsurgical Courses

1. *Advanced Microsurgical Courses of Male Infertility* (35 to 70 hours)

   - Lecture and review our current videotapes:

     - Microsurgical Vasovasostomy: The Microdot Method of Precision Suture Placement (1996)
     - No-Scalpel Vasectomy: with a step-by-step instruction (1996)
     - Mini-incision Microsurgical Subinguinal Varicocelectomy with Delivery of the Testis (1995)
     - Microsurgical Epididymal Sperm Aspiration with ICSI (1996)
     - Creation of A Hypospadias Dog Model and Microsurgical Hypospadias Reconstruction Using A Tubularized Mucosal Graft (1996)
     - The Autogenous Sperm Reservoir (1995)
     - Interviews on Male Infertility with ABC, CBS, NBC and others. (1996)
     - State-of- the-art lectures for male and female infertility treatment (1997)
     - Triangulation End-to-side Microsurgical Vasoepididymostomy (1998)
     - Microdissection TESE: Sperm Retrieval in Non-obstructive Azoospermia (1998)

   - Evaluation of participant's current microsurgical skills
   - Mastery of microsuture technique and tying skills on the practice card
   - Practice using fine size silicone tubing for end-to-end microdot technique or end-to-side anastomosis with one or two layers (10-0 or 11-0 sutures)
   - Mastery of the end-to-end technique using two or three layers
   - Use of vasectomy segments for two or three layers with microdot technique
   - Mastery of the use of bipolar forceps to control bleeding
   - Use of the rat model for microsurgical vasovasostomy with microdot technique
   - Rat vasoepididymostomy: end-to-end and end-to-side techniques

2. *Special Advanced Microsurgical Training Courses of Male Infertility* (14 to 20 hours)

   - Micropuncture Epididymal Sperm Aspiration (MESA) in the rat
   - Testicular Sperm Aspiration (TESA) in the rat
   - Microdissection TESE Technique
   - Triangulation end-to-side microsurgical vasoepididymostomy

3. *Microvascular and Reconstructive Microsurgical Course* (35 Hours)

- Free-flap microsurgical techniques
- Sciatic nerve repair
- Tubule re-anastomosis
- Microsurgical organ transplantation

No-Scalpel Vasectomy Hands-on Training Course

1. *NSV Training Lecture* (3 hours)

- History
- Preoperative evaluation
- Patients selection
- General importance of NSV Preparation
- Step-by-step NSV instrumentation
- Step-by-step NSV surgical technique demonstration with slides and videos
- Short term and long term Complications
- Postoperative results
- Evaluation of vasectomy occlusion techniques (sutures, clips, thermal and electrical cautery)

2. *NSV Hands-on Training using a Scrotal Model:* (3 hours)

- Review of the NSV instruction manual and video
- Learning how to manipulate NSV instruments (Ringed Forceps and Dissecting Forceps)
- Learning to use the three-finger technique to isolate and fix the vas.
- Mastery of the NSV vasal block technique for local anesthesia
- Use of a scrotal model for step-by-step NSV hands-on training
- Mastery of delivery of the vas with NSV instruments without destruction the vasal vessels or nerves.
- Learning to perform a good NSV with minimal bleeding and pain.

Operating Room Observation

With permission, you may have the opportunity to observe Dr. Marc Goldstein, Dr. Peter N. Schlegel's microsurgical performance in the operating room via the microscope video monitor.

This would include approximately 2 to 4 microsurgical varicocelectomies, 2 or 4 vasovasostomies, vasoepididymostomies and the microsurgical epididymal sperm aspiration technique (MESA) or the testicular sperm Aspiration (TESA) and microdissection: TESE-sperm retrieval in non-obstructive azoospermia. In addition, you may have the opportunity to observe the No-Scalpel Vasectomy (NSV) procedure. You are also welcome to participate in all of our academic activities at Department of Urology at Cornell during your visit.

Certificate

Participants who have completed this program and demonstrated satisfactory microsurgical or NSV skills will receive a letter certifying satisfactory completion of the microsurgical training course and a certificate for microsurgical training course.

Program Schedule and Registration Fee

The registration fee for each of the microsurgical course is required and payable to the *Center for Reproductive Medicine and Microsurgery*. For the foreign participants, deposits may be submitted with a foreign draft payable in U.S. dollars with a correspondent US Bank.

Appointments should be made at least six to ten weeks in advance. For further information about this one-one hands-on microsurgical training program, please directly contact us through the following address:

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