

Poster Presentation #10  
Innovative Technologies

**MULTISPECIALTY SINGLE PORT ROBOTIC TECHNOLOGY APPLIED IN THE LIVE ANIMAL MODEL:  
PROOF OF CONCEPT**

Travis Rogers\*, Global Robotics Institute, Florida Hospital  
Hariharan Palayapalayam Ganapathi, Global Robotics Institute, Florida Hospital  
Fikret Onol, Global Robotics Institute, Florida Hospital  
Eduardo Parra-Davila, Celebration Center for Surgery, Florida Hospital  
Armando Melani, Americas Medical City  
Ricardo Estape, South Miami Gynecology Oncology Group  
Vipul Patel, Global Robotics Institute, Florida Hospital

**Purpose:** As the field of robotic surgery advances and technology improves, delivering a less invasive surgical option that continues to decrease the morbidity associated with multi-port laparoscopic and open surgery is at the forefront of most companies' design efforts. In this light Titan Medical Inc. (Toronto, Ontario) is developing a single port robotic platform (SPORT Surgical System) that can be utilized across multiple surgical specialties.

**Materials and Methods:** The SPORT Surgical System is a single port robotic platform that is comprised of two main components: a surgeon workstation and a patient cart. The surgeon workstation is where a surgeon operates the multi-articulated instruments and 3D high-definition camera using a natural handle interface and a 3D high-definition flat-screen display. The patient cart is a single boom system which suspends a central unit that connects to the 3D high definition camera and two 8mm multi-articulating exchangeable instruments. The SPORT Surgical System offers a comprehensive set of instruments including monopolar and bipolar instruments along with needle drivers and graspers. The SPORT Surgical System was installed at the Florida Hospital Nicholson Center training facility in September 2017 to conduct feasibility studies. To date, there have been five surgeons across three specialties who have used the single port technology to perform a variety of specialty-specific procedures on live animals.

**Results:** The five surgeons performed eleven procedures on nine live animals. The three specialties involved were urology, colorectal surgery, and gynecology. All three of the urological surgeries performed were renal procedures. The first two procedures were attempted by a combination of two surgeons (attending and fellow). These procedures were attempted to assess feasibility/ease of port placement and the docking process. Once access was achieved, hilar dissection with identification/isolation of the renal artery, vein, and ureter were completed. The third urologic procedure was a partial nephrectomy which was completed with a cross clamp time of twelve minutes. After initial evaluation and usage of the SPORT Surgical System by the urology team other specialties became involved. Four procedures were performed by the colorectal surgeons. Two colectomies were completed without incident, one by a single surgeon and a combination of two surgeons for the second. The other procedures performed were a low anterior resection and a cholecystectomy. The gynecologist completed four hysterectomies in total. The first two were simple hysterectomies with bilateral salpingo-oophorectomies and pelvic lymphadenectomies. The second two were radical hysterectomies with radically wide margins and pelvic/para-aortic lymphadenectomies. There were no conversions to open procedures or major complications in any of the procedures.

**Conclusion:** The SPORT Surgical System is a robotic single port platform that has been shown to be successful in the live animal model across several specialties. In our experience, multiple surgeries have been completed by multiple surgeons of varying experience with this developing technology. Further study and evaluation of more data points with eventual transition to the human model needs to be undertaken, but as of now the SPORT Surgical System by Titan Medical is proving to be a feasible and reliable advancement in the field of single incision robotic surgery.