FIRST HUMAN EXPERIENCE USING THE NOVATRACT™ LAPAROSCOPIC DYNAMIC RETRACTOR
Koji Park MD, Andrew J Duffy MD, Kurt E Roberts MD
Department of Surgery, Yale University School of Medicine, New Haven, CT

OBJECTIVE:
The quest to minimize surgical trauma has led to the development of Natural Orifice Transluminal Endoscopic Surgery (NOTES) and Laparoendoscopic Single-Site (LESS) surgery. The concept of reducing the number of transabdominal access ports has been criticized for violating basic tenets of traditional multiport laparoscopy. Critics challenge that without widely-spaced access ports, triangulation is difficult to achieve, instruments are limited to parallel, in-line movements, and traction/countertraction is compromised.

The potential benefits of NOTES and LESS surgery include decreased postoperative pain, improved cosmesis, and fewer wound-related complications. However, the technical challenges associated with these access methods have not been adequately addressed by advancements in instrumentation. The NovaTract™ Laparoscopic Dynamic Retractor (NovaTract Surgical, Inc., Madison, CT) was designed to meet several objectives:

- Ease of use
- Reestablish working angles associated with traditional multiport laparoscopy
- 5 mm introduction platform
- Dynamic: allowing for adjustable tension
- Dynamic: allowing for simple manipulation and adjustment on tissue
- Secure but atraumatic tissue grip

DESCRIPTION
The NovaTract™ Laparoscopic Dynamic Retractor is a 5mm deployable intracorporeal retractor. The device consists of a delivery system which includes: a deployable abdominal wall anchor, a deployable atraumatic grasper, all of which is attached to a retraction tension line. Tissue is held securely with a grasper. The anchor is then deployed against the abdominal wall, and acts as a fulcrum for the tension line. The tension line can be pulled through the trocar with varying degrees of tension to manipulate the object of interest, while simultaneously freeing up this trocar for other working instruments. The location of both the anchor and grasper can be easily altered.

PRELIMINARY RESULTS
We have successfully performed two-port laparoscopic cholecystectomy in five consecutive patients with a preoperative diagnosis of symptomatic cholelithiasis. Mean age was 34 years. Mean BMI was 26.7 kg/m2. Mean operating time was 65.4 minutes. All patients were discharged on the same day of surgery. No complications have been noted in short-term follow up

CONCLUSIONS/FUTURE DIRECTIONS
The NovaTract™ Laparoscopic Dynamic Retractor appears to have met the initial objectives set forth. It is easy to use, has little to no learning curve, allows the surgical approach to mimic more conventional laparoscopic approaches, and will enable the reduction of dedicated trocar ports used for retraction of tissue.

A laparoscopic cholecystectomy can easily be performed with only two ports: the umbilical port for camera access and the subxiphoid port for dissection, ligation and cautery instruments, and retraction tension line(s) via the NovaTract™ Laparoscopic Dynamic Retractor.

A larger series of patients with longer follow-up will be required to demonstrate its efficacy and safety profile. We expect that the device may also be used to facilitate many other reduced-port laparoscopic procedures in the future, to include but not limited to appendectomy, oophorectomy, myomectomy, lymph node dissection, and colon resection.

![Img 1: NovaTract™ Device](Image)

![Img 2: Device deploying atraumatic grasper](Image)

![Img 3: Device deploying anchor in abdominal wall](Image)

![Img 4: Traction on tension line facilitates tissue retraction](Image)

![Img 5: Two NovaTract™ grasper tips deployed through one port, facilitating critical view of safety](Image)