

Table 1  
Hemostatic Agents Used in Robotic Assisted Laparoscopic Gynecological Surgeries

Hemostatic Agent	Manu- facturer	Mechanism of Action	Material	Benefits	Risks	Cost
SURGICEL® Fibrillar™	Ethicon	vasoconstriction, platelet plug formation	oxidized regenerated cellulose	bactericidal activity, plant derived	foreign body reaction	\$153
SURGICEL® SNOW™	Ethicon	vasoconstriction, platelet plug formation	oxidized regenerated cellulose	bactericidal activity, plant derived	foreign body reaction	\$153
SURGIFLO®	Ethicon	platelet plug formation, fibrin clot formation	flowable gelatin, thrombin	mixed with thrombin stops bleeding within 2 min	porcine gelatin	\$220
FLOSEAL®	Baxter	platelet plug formation, fibrin clot formation	flowable gelatin, thrombin	mixed with thrombin stops bleeding within 2 min	bovine gelatin-variant Creutzfeldt- Jacob disease (vCJD)	\$188 (5ml), \$344 (10ml)
VITAGEL™	Stryker	fibrin clot formation, fibrinolysis	fibrin sealant	human product, fibrinogen/ thrombin, mixed with patient blood	bovine gelatin-variant Creutzfeldt- Jacob disease (vCJD)	\$290 (2ml), \$550 (4.5ml)
EVICEL®	Ethicon	fibrin clot formation, fibrinolysis	fibrin sealant	fibrin clot independent of patient coagulation profile, human formulation	human plasma-Creutzfeldt- Jacob disease (CJD)	\$573 (10ml)
ARISTA™	Medafor	dehydrates blood, clots on contact, gel matrix	powder, absorbable hemostat	fibrin clot, absorbable, plant derived	glucose overload if>50gm used	\$253 (5mg)

**Study Objective:** To review characteristics and applications of various hemostatic agents in robotic assisted laparoscopic surgeries. Different hemostatic agents are used adjunctively in laparoscopic surgeries to achieve bleeding control. Proper selection of a hemostatic agent should depend on a thorough understanding of their mechanism of action and efficacy. The different characteristics of these hemostatic agents are highlighted and their mechanism of action, in relation to the coagulation cascade, is emphasized.

**Design:** Review of four categories of hemostatic agents including seven examples used in robotic assisted laparoscopic gynecological surgeries.

**Setting:** Community based urban teaching hospital with advanced laparoscopic and robotic technology.

**Patients:** Seven patients undergoing robotic assisted gynecological surgery.

**Intervention:** Robotic assisted gynecologic procedures are presented where hemostatic agents are utilized to provide adequate bleeding control.

**Measurements and Main Results:** Seven commercially available hemostatic agents were utilized in patients undergoing robotic assisted benign gynecological procedures. Four different categories with some examples are provided. 1. Oxidized regenerated cellulose: Surgicel® Fibrillar™ and Surgicel® Snow™ 2. Flowable gelatins that provide a hemostatic matrix: SurgiFlo® and Floseal, 3. Fibrin sealants: Evicel® and Vitagel™, 4. Absorbable hemostat: Arista™. The choice of a specific hemostatic agent was dependent on the severity of bleeding, type of procedure and surgeon preference. Adequate hemostasis was achieved in all surgeries.

**Conclusion:** Hemostatic agents are very beneficial in optimizing bleeding control during gynecological surgery. A comprehensive knowledge of the product characteristics and mechanism of action will provide the gynecologic surgeon a clearer understanding on indication of use and encourages patient safety.

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**Versatile Applications of the BeamPath® CO2 Laser in Robotic-Assisted Gynecologic Surgeries**

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**Study Objective:** Although the benefits of CO2 lasers in gynecologic procedures are well- understood, the cumbersome nature of the traditional design has limited its applicability in robotic-assisted laparoscopic procedures. The recent availability of the BeamPath® CO2 laser fiber, however, may allow surgeons to precisely deliver the energy to the most intricate surgical areas. The objective of this study was to assess the utility of this instrument in robotic-assisted endometriosis procedures.

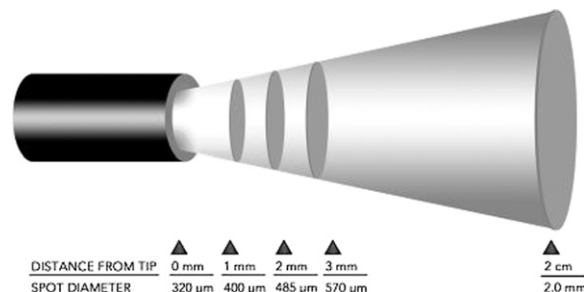


Figure 1. As the distance from the tissue increases, there is an increases in spot size and a corresponding decreases in powder density.

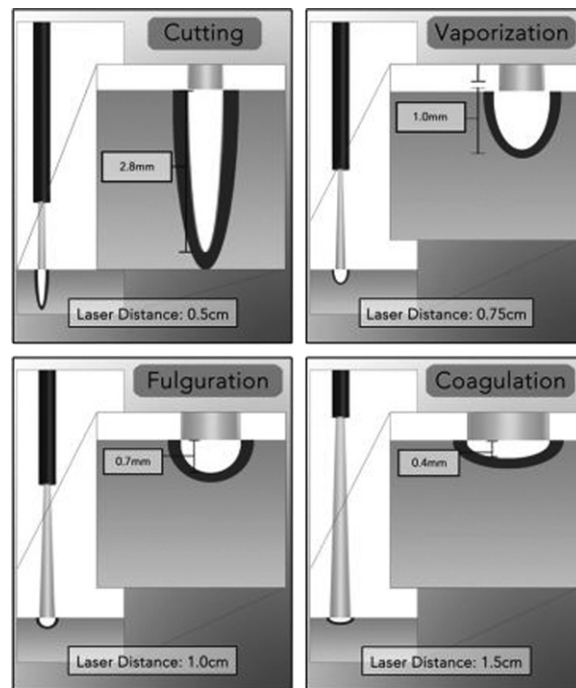


Figure 2. The divergent beam enables the surgeon to control tissue interaction by altering the distance from the tissue. Calculation based on 8W power setting and 1s dwell time (Mckenzie AL, Phys. Med. Biol., 1983; 28(8);905-12).

**Design:** The utility of the CO2 laser fiber was evaluated in a series of robotic-assisted endometriosis procedures. Techniques for cutting, vaporization, fulguration, and coagulation were characterized.

**Setting:** Community-based, teaching urban hospital with advanced laparoscopic and robotic technology.

**Patients:** Eight patients undergoing robotic assisted-laparoscopic surgeries for the treatment of endometriosis.

**Intervention:** Application of the CO2 BeamPath® fiber system with the robotic technology in patients treated for endometriosis.

**Measurements and Main Results:** The CO2 BeamPath® fiber system was successfully utilized to treat patients with different stages of endometriosis. Unlike traditional CO2 laser systems, the BeamPath® is able to be delivered through the robotic surgical platform utilizing an instrument that attaches to the standard needle driver arm. Furthermore, the CO2 laser fiber features a divergent beam that allows the surgeon to vary the depth of tissue penetration by changing the distance from the tissue.

The divergent beam enables versatility between four different modes of laser interaction: cutting, vaporization, fulguration, and coagulation.

Additional range in penetration depth can be achieved by changing the laser power setting, the dwell time and the type of tissue treated. Each mode of laser tissue interaction is demonstrated using a representative video clip.

**Conclusion:** Laser technology used in robotic gynecologic procedures is a safe, precise and versatile technique which provides additional options for robotic surgeons. Adequate knowledge of various laser applications is imperative to enable this precise and sophisticated technology to treat more challenging disorders.

#### VIRTUAL POSTER: UROGYN/PELVIC FLOOR DISORDERS/ VAGINAL SURGERY

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##### Comparison of the Clinical and Quality-of-Life Outcomes after the Inside-Out TVT-O Procedure with or without Concomitant Transvaginal Gynaecological Surgery

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**Study Objective:** The study was undertaken to compare the clinical and quality-of-life (QoL) outcomes of the inside-out transobturator vaginal tape (TVT-O)-only procedures and TVT-O procedures with concomitant transvaginal gynaecological surgery for the treatment of stress urinary incontinence (SUI).

**Design:** A review of charts from January 2006 to March 2010.

**Setting:** 305 patients with urodynamic stress incontinence for whom we performed the TVT-O.

**Patients:** Of the initial 305 patients, 272 (89.2%) were reexamined for complications 1 month, 4 months, 1 year and 2-4 years postoperatively (122 TVT-O only; 150 TVT-O other transvaginal gynaecological surgery). They were also evaluated with the Urogenital Distress Inventory Questionnaire (UDI-6) and the Incontinence Impact Questionnaire (IIQ-7) 1-4 years after the procedure.

**Measurements and Main Results:** The median follow-up was 37.3 months. The success rate was 89.3% in the TVT-O-only group vs 93.3% in the TVT-O with concomitant gynaecological surgery group ( $p = 0.729$ ). The QoL score was quite good for 91.8% of the TVT-O-only patients and for 96.7% of the TVT-O with concomitant gynaecologic surgery patients ( $p = 0.405$ ).

**Conclusion:** Gynaecological operations performed concomitantly with the TVT-O procedure do not affect the clinical and QoL outcomes of the TVT-O procedure.

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##### Analysis of Joint Surgical Approach to Minimally Invasive Repair of Apical Prolapse

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**Study Objective:** To analyze perioperative outcomes of collaborative surgical cases between Urogynecology and Minimally Invasive Gynecology in the repair of apical pelvic organ prolapse.

**Design:** Retrospective cohort study.

**Setting:** Tertiary-care academic center.

**Patients:** 121 women (ages 31-78) who underwent cases of joint Urogynecology and Minimally Invasive Gynecology surgical treatment for apical prolapse between February 2009 and December 2011.

**Intervention:** Completed laparoscopic surgeries included laparoscopic sacrocolpocopy ( $n = 7, 6\%$ ), laparoscopic colpopexy ( $n = 23, 19\%$ ), total laparoscopic hysterectomy and sacrocolpocopy ( $n = 4, 3\%$ ), laparoscopic supracervical hysterectomy and cervicopexy ( $n = 70, 58\%$ ), hysteropexy ( $n = 2, 2\%$ ), total laparoscopic hysterectomy and uterosacral ligament suspension ( $n = 11, 9\%$ ). Additional procedures included vaginal repairs and suburethral slings as indicated.

**Measurements and Main Results:** The mean surgical operating time was 130.5 mins (SD 42.3), and mean estimated blood loss 98.8 mL (SD 63.28), with mean operative cost \$19,617.03 (SD 3,667.3). There were five intraoperative complications (4%), consisting of bladder injuries which were noted and repaired intraoperatively by the primary surgeons. Postoperatively, there were three mesh-related infections (2.5%), with two cases requiring reoperation for mesh removal. Eight patients (6.6%) experienced prolapse recurrence. Mean change in POP-Q measurements did not differ significantly between concomitant hysterectomy versus prior hysterectomy groups, but did differ significantly between mesh procedures with cervix present versus prior cervix removal for the following measurement points: Aa ( $p = .02$ ), Ba ( $p = .008$ ), and C ( $p = .01$ ).

**Conclusion:** Surgical repair of apical prolapse performed collaboratively between Urogynecology and Minimally Invasive Gynecology teams is an effective surgical option which has demonstrated good clinical results in this retrospective analysis. This method is a unique surgical strategy that offers the benefit of comprehensive prolapse repair in a safe, time-efficient and cost-effective manner, and may be a better alternative to a single surgeon performing the entire procedure.

