
This paper presents the opinion of Dr. Mario Nutis, MD FACOG FPMRS. Bovie Medical Corporation's J-Plasma electrosurgical generators and hand pieces are indicated for the delivery of helium gas plasma to cut, coagulate, and ablate soft tissue during open and laparoscopic surgical procedures. The safety and effectiveness of J-Plasma for the treatment and prevention of endometriosis has not been established. Dr. Nutis is a paid consultant to Bovie Medical Corporation.

White Paper

J-PLASMA: SURGICAL TREATMENT OF ENDOMETRIOSIS

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Introduction

Endometriosis is defined as the presence of endometrial glands and stroma outside of the endometrial cavity.¹ Endometriosis affects 6-10% of women of reproductive age, 50-60% of women and teenage girls with pelvic pain, and up to 50% of women with infertility.^{2,3} The optimal technique for surgical management of peritoneal endometriosis is not clear. There is little evidence from randomized controlled trials (RCT) to guide surgical management of endometriosis associated pelvic pain.⁴ The general consensus among minimally invasive surgeons is in favor of excision.

In one trial of excision versus ablation for endometriosis by Healey et al. 2010⁵, the differences in pelvic pain were not statistically significant, but there were trends for a difference in bowel-related symptoms and dyspareunia. However, the pilot feasibility study by Yeung et al. 2013⁴, which was a prospective multicenter study on excision for endometriosis, found there were significant improvements in quality of life and reductions in pelvic pain scores for dysmenorrhea, dyspareunia, and bladder symptoms but not bowel symptoms.

Challenge

In practice, there is a tendency for gynecologic surgeons to want to perform ablation because it is considered easier. Theoretically, excision is advantageous because it ensures that the entire lesion or pathologic tissue is removed, especially for deeply infiltrating endometriosis (DIE) or disease found over a vital organ or structure.⁴ Endometriotic implants, which infiltrate the peritoneum more than 5mm, are defined as DIE and present with nodular lesions, composed of fibro muscular tissue, endometrial glands, and stroma.⁶ However, ablative procedures will not safely reach a depth of 5mm or greater and result in incomplete treatment. Additionally, surgical intervention at a greater depth is associated with a risk of intra-and /or post-operative complications.^{7,8,9} For these reasons, the needs exists for gynecologic surgeons to safely and effectively treat both superficial lesions and DIE.

The Solution

Bovie Medical Corporation's J-Plasma represents a patented approach to electro-surgery whereby helium-heated plasma, fueled by electrosurgical energy, flows into the application site for only a brief interval then disperses leaving precise and predictable effects. There is no net flow of electricity around the body, so no return electrode is required. The cold plasma effect is highly localized, minimizing collateral damage to surrounding healthy tissue and requires no grounding pad, both of which differentiate J-Plasma from standard electrosurgical devices.¹⁰ With the highest settings, J-Plasma's energy has a maximum depth spread of approximately 2mm and a maximum lateral spread of 4mm. This precision along with J-Plasma's full range of settings offers gynecologic surgeons the ability to meticulously remove DIE.

The Results

In 2015, I switched to using J-Plasma from the CO₂ laser to what I thought would be similar tissue effects but with a favorable price point. What I discovered is that J-Plasma allows for advanced retraction that I cannot accomplish with CO₂ laser. Additionally, I found it to be adaptable for a wider range of procedures that previously were not available with the use of CO₂ laser.

Today, a typical week of surgeries includes using J-Plasma an average of five times, because it is especially applicable in the treatment of endometriosis. My typical treatment approach includes excision of the involved peritoneum when possible and ablation when not. This method allows for maximum surgical benefit for the patient. As we know, endometriosis has differing appearances contingent on multiple factors. As an advocate for treating occult disease, I excise, when possible, areas of the peritoneum that appear to be involved, and prophylactically the areas where the patient reports symptoms. If excision is not possible, ablation is performed. Both techniques are demonstrated in videos available on the Bovie Medical's web site (<http://www.boviemed.com/>). By adopting this approach, I have seen an approximately 80% symptom improvement in my patients after surgery.

The patient in both videos is of a 31-year-old gravida 2 with two prior cesarean sections. She complains of symptoms consistent with endometriosis, including pain, desires to retain her fertility, and has failed conservative measures. Symptoms were present both anteriorly and posteriorly. After hydro-dissection, the involved areas were excised with J-Plasma settings of 40% power and 4 L/min flow. This method allows for avoidance of injury to vital underlying and surrounding tissue, yet enables precise excision of diseased tissue. For demonstration purposes, an area of peritoneum was ablated to show the hemostatic nature of J-Plasma and minimal thermal injury to the tissue. These attributes intuitively contribute to less adhesion formation. At her postoperative visit, the patient reported significant improvement from the level of her preoperative pain and symptoms.

Conclusion

In conclusion, Bovie Medical's J-Plasma allows me to treat endometrial disease with precision at a favorable price point. My patients report improved outcomes with a reduction of pain and other common endometrial symptoms demonstrating benefit from this more precise and revolutionary surgical tool.

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