

# Comparative Thermal Effects of J-Plasma®, Monopolar, Argon, and Laser Electrosurgery in a Porcine Tissue Model

[Search your library](#)

[Salome Masghati, University of Nevada, Las Vegas](#)

Follow

[Jasmine Pedroso, Women's Pelvic Health Center](#)

[Melissa Gutierrez, Women's Pelvic Health Center](#)

[Erica Stockwell, Women's Pelvic Health Center](#)

[K. Warren Volker, Women's Pelvic Health Center](#)

[David L. Howard, Women's Pelvic Health Center](#)

SHARE



## Document Type

Article

## Publication Date

4-30-2019

## Publication Title

Surgical Technology International

## Volume

34

## First page number:

35

## Last page number:

39

## Abstract

**INTRODUCTION:**The objective of this study was to understand how J-Plasma® (Bovie Medical Corporation, Clearwater, Florida) surgical energy compares to monopolar, argon beam, and CO2 laser devices in terms of depth of penetration and lateral thermal spread in a porcine tissue model. **MATERIALS AND METHODS:**Using a porcine animal model, we applied the thermal energy of the J-Plasma® laser, Bovie Monopolar Pencil (Bovie Medical Corporation, Clearwater, Florida), argon beam coagulator, and CO2 laser to porcine small bowel, bladder, and peritoneal tissues at equivalent settings. Tissue was excised and sent to pathology for histologic evaluation. Primary outcome was depth of penetration and lateral thermal spread. **RESULTS:**When applied to peritoneum tissue, CO2 laser had the greatest lateral thermal spread at 2.99mm, while the argon beam had the lowest at just under 1.5mm. With regard to depth of penetration, the monopolar pencil had the highest while J-Plasma® had the lowest. When applied to bladder tissue, the argon beam was associated with the greatest lateral thermal spread (3.1mm) as compared to the other three devices (all less than 1mm). In terms of depth of penetration of bladder tissue, J-Plasma® again had the lowest value, while the monopolar pencil had the highest. When applied to small intestine tissue, the argon beam had the greatest lateral spread (3.51mm), while J-Plasma® had the lowest (less than 1mm). Regarding depth of penetration of small intestine tissue, argon beam had the highest value at 1.8mm compared to the other three devices (all below 0.6mm).

**CONCLUSION:**Consistent with our previous study, J-Plasma® had minimal lateral and depth spread when applied to various tissue types. J-Plasma® performed better or similar when compared to monopolar, argon beam, and laser electrosurgical devices. Further studies in-vivo are needed to evaluate safety and surgical application of the J-Plasma® device.

## Disciplines

Medical Specialties | Medicine and Health Sciences | Surgery

## Language

English

## Repository Citation

Masghati, S., Pedroso, J., Gutierrez, M., Stockwell, E., Volker, K. W., Howard, D. L. (2019). Comparative Thermal Effects of J-Plasma®, Monopolar, Argon, and Laser Electrosurgery in a Porcine Tissue Model. *Surgical Technology International*, 34 35-39.

[Click To Purchase Article](#)