Electrosurgery is the application of a high-frequency (radio frequency) alternating polarity, electrical current to biological tissue as a means to cut, coagulate, desiccate, or fulgurate tissue.

Its benefits include the ability to make precise cuts with limited blood loss. Electrosurgical devices are frequently used during surgical operations helping to prevent blood loss in hospital operating rooms or in outpatient procedures.

Bipolar electrosurgery in the minimally invasive endoscopic surgery theater has been traditionally limited to the use of standard bipolar forceps, which are minimally versatile, have a limited range of motion, and are associated with visualization and handling constraints. The authors designed a novel surgical device system in which commonly used surgical instruments (suction, microscissors, microgaspers, and dissectors) co-function as individually insulated and modular electrodes for bipolar electrosurgery. In this feasibility study, the successful use of these prototypes in endonasal endoscopic transsphenoidal surgery was demonstrated on 2 human cadavers, and in an in vivo arterial coagulation model on 2 live rats. This prototype system provided improved bipolar instrument mobility, minimized the requirement to exchange surgical instruments when performing electrosurgery, and allowed for new maneuvers that optimized surgical workflow, such as the ability to suction blood and smoke while cauterizing. This multifunctional bipolar cautery system may improve surgical efficiency and workflow and facilitate surgical microdissection and electrocautery during minimally invasive, endoscopic, robotic or traditional open surgery [1].

1)
Mittelstein D, Deng J, Kohan R, Sadeghi M, Maarek JM, Zada G. Novel technique of a multifunctional electrosurgical system for minimally invasive surgery. J Neurosurg. 2016 Apr 29:1-6. [Epub ahead of print] PubMed PMID: 27128589.