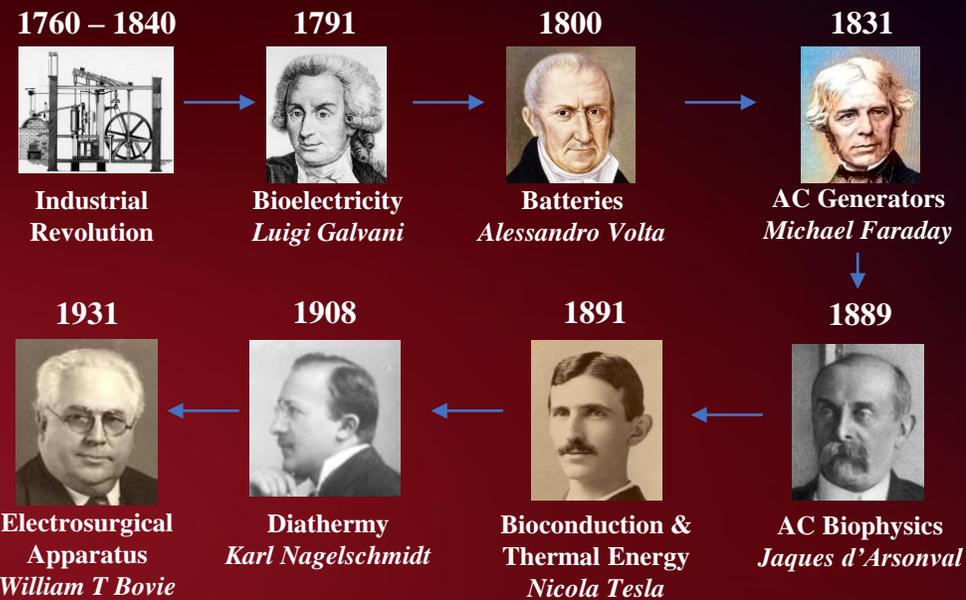


ELECTROSURGERY AND THE ADVENT OF THE BOVIE: THE HISTORY OF ELECTROCAUTERY

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Introduction: On October 1st 1926, the first electrosurgery device was used for the resection of a cranial tumor, which was previously considered unresectable. John Marshall published his use of electrically heated platinum wire to cauterize and cause fistula tract closure using electrical energy in 1851. Jaques Arsene d'Arsonval and Nikola Tesla introduced A-C electricity in 1889. Karl Franz Nagelschmidt coined the term 'diathermy' where he discovered that A-C electricity could cut biological tissue without causing muscular contraction. The very first apparatus for electrosurgery was put together by William T. Bovie and was proceeded to be used by Harvery Cushing, who utilized this apparatus in the resection of a large cranial mass which was previously aborted as it was considered unresectable due to blood-loss.

Methods: This presentation is a literature review describing the development and implementation of electrosurgery and the associated technologies and implications. The focus of the project is to examine how practitioners have evolved medical practice guidelines, surgical approaches, surgical capabilities, and how electrosurgery may be evolving current practices.



Results: The rapid technological advancements of the industrial revolution allowed for biomedical engineering to become a pertinent part of the medical field. Development and studies of electrical instruments and the associated effects on biological specimens allowed the use of electrical energy to be used for cutting and cauterizing tissues during surgical procedures. The modern technological revolution is advancing the surgical practices today with new robotic technologies. The use of ultrasound frequencies are being employed today for new surgical tools and implications.

Conclusion: Surgeons today rely on many modern and revolutionary tools. These technologies are expanded and refined forms of electrocautery that began during the industrial revolution. The great inventors and the pioneers in engineering and medicine have allowed surgical practices to expand beyond the previous limitations. The continued innovation and modern technologies are allowing the field of surgery to continually transform allowing for greater outcomes, new possibilities and ultimately better quality of life for our patients.

Fun Fact! In 1926, US patent 1,586,645 was published by William Bierman describing an electrosurgical device for dividing tissue. There are no good historical texts citing this product or the use in transforming surgical practices. A 1940 publication on Electrosurgery describing fulguration and desiccation and the use of electrocautery was written by Dr William Bierman in the American Journal of Surgery.

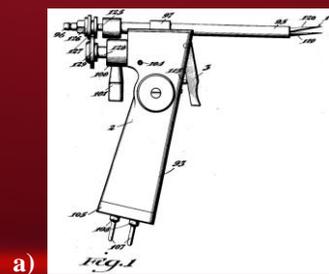


Figure 1 a) The original patent of William Bovie's electrosurgical apparatus was accepted and published in 1931. b) Modern electrosurgical device used today for dividing tissue and for adequate hemostasis.

