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Evidence-based use of pulsed electromagnetic field therapy in clinical plastic surgery

Berish Strauch 1, Charles Herman, Richard Dabb, Louis J Ignarro, Arthur A Pilla

Affiliation:

1Albert Einstein College of Medicine, Bronx, NY, USA. bstrauch@montefiore.org
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Abstract:

Background: The initial development of pulsed electromagnetic field (PEMF) therapy and its evolution over the last century for use in clinical surgery has been slow, primarily because of lack of scientifically-derived, evidence-based knowledge of the mechanism of action.

Objective: Our objective was to review the major scientific breakthroughs and current understanding of the mechanism of action of PEMF therapy, providing clinicians with a sound basis for optimal use.

Methods: A literature review was conducted, including mechanism of action and biologic and clinical studies of PEMF. Using case illustrations, a holistic exposition on the clinical use of PEMF in plastic surgery was performed.

Results: PEMF therapy has been used successfully in the management of postsurgical pain and edema, the treatment of chronic wounds, and in facilitating vasodilatation and angiogenesis. Using scientific support, the authors present the currently accepted mechanism of action of PEMF therapy.

Conclusions: This review shows that plastic surgeons have at hand a powerful tool with no known side effects for the adjunctive, noninvasive, nonpharmacologic management of postoperative pain and edema. Given the recent rapid advances in development of portable and economical PEMF devices, what has been of most significance to the plastic surgeon is the laboratory and clinical confirmation of decreased pain and swelling following injury or surgery.