

RF Assisted Management of Keloids

Chittoria R.K.*, Elankumar S.**, Kumaran M.S.**, Sudhanva H.K.**, Preethitha B.**, Friji M.T.***, Mohapatra D.P.***, Dineshkumar S.***

Author Affiliation:

*Additional Professor & Head **Senior Resident ***Associate Professor, Department of Plastic Surgery, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Pondicherry, India-605006.

Reprint Request:

Ravi Kumar Chittoria
Head, Department of Plastic Surgery,
JIPMER, Pondicherry, India.
E-mail: drchittoria@yahoo.com

Received on: 24.10.2016

Accepted on: 26.11.2016

Abstract

Intraoperative bleeding can be cumbersome while operating on scars using a scalpel. Though skin incisions by a scalpel is of common practice, incisions done by electromagnetic radiation of high frequency in the form of radiofrequency are more precise, accurate, associated with less bleeding and in turn less time consuming giving more defined result. Intra-lesional Keloid scar excisions required good haemostasis and precision leaving behind only a thin rim of tissue.

Keywords: Keloid; Radiofrequency; Intra-Lesional Excision.

Introduction

Intraoperative bleeding obscures the operative field, and use of electrocautery can lead to charring of tissues. Achieving haemostasis during surgeries for keloid scars whose blood vessels have little or no contractile tissues is always a challenge to surgeons. Incision by Radiofrequency (RF) aids in a pressure less incision with no dragging or bunching of tissue with simultaneous cutting, coagulation, and precision of incision [1,2]. Radiofrequency incision causes less lateral tissue damage compared to other heat-producing devices [3]. We present use of RF probe for intra-lesional keloid excision in a 55 year old male.

Material and Methods

A 55 year aged male presented to the outpatient department of Plastic Surgery, JIPMER, Puducherry in July 2016 with 6 years old post traumatic keloid over the presternal region with recurrent episodes of scar abscess lasting for 2 years, which was not responding to conservative measures. Treatment plan for the patient was intra-lesional excision of

keloid including all of the infected sinuses and skin grafting followed by steroid injections. Patient was evaluated and underwent intra-lesional keloid excision under local anaesthesia. The scar tissue was excised using radiofrequency probe with a power of 1.7W, instead of using scalpel. It was noticed that the resistance while cutting the scar tissue was least, bleeding was minimal and procedure was completed in minimal operative time. The skin incision had no adverse effect on the skin and the graft take was also very good. On follow-up, skin graft is taken well and there are no post-operative complications



Fig. 1: Pre op



Fig. 2: Intra -op



Fig. 3: Post op

Discussion

Recurrent keloid scars are unsightly, may produce persistent pain, itching and are susceptible to recurrent infections. Though line of management remains conservative for most keloid scars, occasionally an intra-lesional excision may need to be considered [4]. Intra-lesional excision requires a rim of scar tissue to be left in the periphery of the scar. Surgery in keloid scars is more prone to bleeding due to lack of contractile tissues. The use of radiofrequency probe in keloid scars gives a more precise, accurate, blood less field improving the result of surgery.

Radiosurgery has been used to facilitate incisions in diverse fields of plastic surgery including blepharoplasty, face lifting, hair restoration surgery, and abdominoplasty.

Ablation effect on tissues is caused by vaporizing their water content with the help of continuous heat

application in tissues beneath the tip of the active electrode, causing cutting and the coagulation simultaneously. Radiofrequency ablation devices work by generating high frequency voltage of approximately 500 kHz. These devices cause flow of electrical currents through tissues when brought into close vicinity of tissues. The tissues provide the necessary impedance to produce heat as electrons overcome the resistance in the tissues. The patient's body functions as a part of the electrical circuit [4]. The electrical current may pass harmlessly through the patient's body without causing deleterious effects if the current alternates at the much higher frequency in the range of 330,000 cycles per second (330 kHz)

Radiofrequency has various advantages, such as ease of soft tissue ablation, hemostasis, and instant sterilization. There is minimal scar and operative time as well as post-operative pain is less in contrast to conventional scalpel incision.

Conclusion

We suggest that radiofrequency assisted keloid excision is a better and safe alternative to scalpel/ electrocautery because of more precision, better coagulation with less bleeding, less operative time and no undesirable effects on graft take.

References

1. Hambly R, Hebda PA, Abell E, et al. Wound healing of skin incisions produced by ultrasonically vibrating knife, scalpel, electrosurgery, and CO₂ laser. *J Dermatol Surg Oncol* 1988;14:1213-7.
2. Bridenstine JB. Use of ultra-high frequency electrosurgery (radiosurgery) for cosmetic surgical procedures. *Dermatol Surg* 1998;24:397-400.
3. Niamtu J III. 4.0 MHz radio wave applications in cosmetic facial surgery. *J Cosmet Dermatol* 2003; 16:33-46.
4. Wong Micheal S.M.D. Intralesional excision of keloids *Plastic and Reconstructive Surgery*, 2005 August;116(2):675.
5. Berjano, E. Theoretical modeling for radiofrequency ablation: state-of-the-art and challenges for the future, *BioMedical Engineering OnLine*, 2006;5:25.