

## Application of Radio Frequency in the Management of Neurofibroma

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### Abstract

The usual practice of making skin incisions by a scalpel leads to more bleeding and time spent on achieving hemostasis. An alternative to this is to use electromagnetic radiation of high frequency in the form of radiofrequency to make skin incisions that are more precise, accurate, associated with less bleeding and in turn less time consuming giving more defined result. Neurofibromatosis type 1 is associated with multiple swellings all over the body with surgical management required for aesthetic reasons or for symptomatic swellings.

**Keywords:** Radio Frequency; Neurofibroma.

### Introduction

Radio Frequency Ablation (RFA) has gained importance in the recent years as it is highly effective in the cutting of the skin lesions with adequate hemostasis at the same time because of good coagulation. Radio Frequency can be used for incisional techniques that produce full-thickness excision of nevi, neurofibroma, warts [1].

Radio Frequency incision causes less lateral tissue damage compared to other heat-producing devices [2].

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Von Recklinghausen disease or neurofibromatosis type 1 (NF 1) is an autosomal dominant genetic disorder involving chromosome 17q11.2, and presents as a common heritable neurocutaneous disease. NF 1 does not develop life-threatening complications, but some of the lesions may be disfiguring or associated with pain. Various modalities for treatment of cutaneous neurofibromas have been introduced; however, the gold standard for treatment remains controversial [3,4].

The RF technique has several advantages, such as providing an acceptable safety profile for the localized thermal effect without damage to adjacent normal tissue, inducing the hemostasis effect to reduce intraoperative bleeding, and being a relatively quick procedure for small neurofibromas [5]. We present use of RF probe for excision of neurofibroma in a 25 year old male.

### Case Report

A 25 years male presented with multiple swellings all over the body from 15 years. He had complaints of pain in swellings on back and left upper arm which were not responding to conservative measures. Patient had cafe au lait spots on his trunk and lisch nodules. Treatment plan was excision of the symptomatic lesions. Patient was evaluated and underwent excision under local anesthesia (plain lignocaine). For the excision of neurofibroma instead of using scalpel radiofrequency probe with a power of 1.7W was used. It was noticed that with Radio Frequency probe bleeding was minimal, during the entire procedure patient did not experience any pain. and procedure was completed in minimal operative time. The skin incision had no adverse effect on the skin and wound healed without any complications. The patient was followed up for a week and no postoperative pain or infection was observed.



Fig. 1: Radiofrequency probe used for skin incision



Fig. 2: Radiofrequency unit



Fig. 3: Postoperative result

## Discussion

Radio Frequency has found widespread use in cosmetic surgery. It is frequently used in the excision of nevi, removal of vascular lesions, face lifts and even abdominoplasty [1].

The Radio Frequency electrode remains cold during the entire procedure and only the tip of the electrode that comes in contact with the tissue conducts the radiofrequency waves. As the diameter of the tip of the electrode is small, the electrode - tissue interface is small. This causes minimal collateral damage to the tissues (up to 75 micrometer) [6].

In addition, the radiofrequency electrode can cut and coagulate at the same time ensuring good hemostasis during the surgery.

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. Radio Frequency ablation devices work by generating high frequency voltage of approximately 500 kHz. These devices causes 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 [6].

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) Radio Frequency 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 Radio Frequency assisted excision of neurofibroma is a better and safe alternative to scalpel/electrocautery because of more precision, better coagulation with less bleeding and less operative time.

*Conflict of Interest:* None

*Disclosures:* None

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