

Original Article

Cosmetic surgery for superficial facial lesions; our experience with radiosurgical excision

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Abstract *Introduction* Over the past few decades, different ablative and nonablative modalities for skin resurfacing and rejuvenation have been innovated, each having its merits and demerits. For superficial facial cutaneous lesions, the radiosurgical technique with art of curettage (Surgitron®) is an effective modality. It develops a wave of electrons (2 to 4 MHz) that leaves the unit through the handpiece, which in turn may be used for cutting, cutting with coagulation; or for hemostasis.

Objective To assess the aesthetic result of the radiosurgical excision of superficial facial lesions.

Patients and methods This prospective clinical study was conducted at a private cosmetic surgery centre from 1st January 2007 to 30th June 2008. All lesions were excised in local anesthesia with epinephrine. The electrode was held at right angle to the skin and bulk of lesion was removed using cutting current. The unit was then turned to the combination cutting-coagulation mode and with light and continuous strokes the remaining lesion was removed. Bleeding was easily controlled by coagulation mode.

Results Using Surgitron®, 55 different facial cutaneous lesions were excised. The commonest lesions were skin tags and nevi. No complication was seen in any of our patients. During follow up, a second session was required in 5 patients. The post operative aesthetic results were satisfactory in all cases.

Conclusion The technique of radiosurgical excision is simple, less invasive, with minimum scarring and good aesthetic results.

Key words

Facial cutaneous lesions, radiosurgical excision.

Introduction

Over the past few decades, multiple ablative and nonablative modalities for skin resurfacing and rejuvenation have been included in the armamentarium of plastic surgeon and include

lasers, chemical peels, light-based energy, radiofrequency, and dermabrasion¹. Each has its own unique properties, as well as advantages and disadvantages. As far as the superficial skin lesions of face are concerned, the differentiation between benign and malignant lesion is clinically evident to the experienced plastic surgeon.² Despite this, the majority of surgeons still remove these lesions using standard elliptical excision technique. This method of removal is well accepted within the medical

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community, particularly among surgeons. Being practiced since long time, however, there are some disadvantages that include: the necessity for sutures and suture removal, repeated dressing, chances of infection despite prophylactic use of antibiotics, scarring, time spent, and cost to the patient.

Among the latest innovation for facial skin lesion is electrocurettage that simply combines the old dermatologic art of curettage with modern radiosurgical technology.³ We are presently using Ellman Surgitron® for facial skin lesion; which was originally designed by Irving Ellman⁴ in the late 1970s and is currently marketed by Ellman International, Hewlett, NY. The unit weighs a couple of pounds and is extremely portable. The Surgitron® develops a wave of electrons (2 to 4 MHz) that leaves the unit through the handpiece i.e. the active working electrode, enters the tissue, and moves to the passive electrode or ground plate. As a grounding plate, we use a convenient wrist band, which eliminates the need for messy electrode gel or other solutions. The Ellman unit permits selection of three current varieties: (1) a fully rectified, filtered current for cutting; (2) a fully rectified, nonfiltered current for cutting and coagulation in combination; and (3) a partially rectified, nonfiltered current for coagulation and hemostasis only. The technique is extremely simple although like any other new procedure it takes experience to become proficient and there are tricks that one must learn.^{4,5,6}

Herein, we share our experience of radiosurgical excision of superficial facial cutaneous lesions.

Patients and methods

Prior to excision of a facial lesion, a treatment protocol was designed in discussion with our dermatology colleagues.



Figure 1 Surgitron® used for radiosurgical excision.

The facial lesions that were excised using Surgitron® included nevi, keratoses, skin tags, papilloma, minor hypertrophic scar, and spider facial vein.

Each lesion was first anesthetized with 1% xylocaine with 1:100,000 epinephrine diluted with normal saline. Holding the skin taut, a 30-gauge needle was inserted next to the lesion at right angle to it and the needle was directed immediately under the lesion in the dermis. A noticeable blush was the desired effect. Then the Surgitron® handle and attached loop were held in the right hand much the way one would hold a writing pen. It was extremely important to brace the side of the hand and the fifth finger against the patient's skin surface in case the patient suddenly moved and also to steady the surgeon's hand. Initially a thin wire loop electrode activated by the pure cutting current of the Surgitron® was used to remove the bulk of the lesion. The electrode was always held at a right angle to the skin and it was helpful to activate the electrode before actually contacting the lesion. It was important to apply firm traction around the lesion with the thumb and forefinger, taking care to avoid penetration of the electrode below the skin surface. The site of radiosurgery was moistened with a saline compress to decrease tissue drag, if required. Once the bulk of the lesion had been removed, it was submitted

to the pathologist, if indicated. As the amount of lateral heat generated by the filtered cutting current was minimal, the tissue was essentially undamaged and an easy diagnosis could be made. The unit was then turned to the combination cutting-coagulation current (fully rectified, nonfiltered) and the current set at the lowest possible setting that allowed the electrode to glide through the tissue without excessive drag or tissue shredding. Light, continuous strokes, such as those used by an artist, were used to remove the remainder of the lesion. When it appeared as if most of the lesion had been removed, a moistened 2x2 gauze sponge was used to abrade the surface to remove any carbonized tissue and to allow the surgeon to determine if any residual lesion remained. At this point the skin tension was relaxed so that skin contour could be observed, especially any persistent elevation of the lesion above the surrounding skin. Any remaining curettage was done without applying any tension to the skin. Usually, the dissection was extended into the skin immediately surrounding the lesion to avoid any significant step-offs in contour. There was usually little if any bleeding to obstruct our vision, but if this became bothersome, the unit could be turned to the straight coagulation current and the bleeding easily controlled without damaging the underlying or surrounding tissue. If char debris did build up on the electrode loop, as it often did, it was gently removed with a moist sponge, taking care to avoid damage to the wire. These loops could be re-sterilized after every case and if handled carefully, could often be used to remove up to 50 or more lesions. The two electrodes used most commonly utilized were the 6 mm thin wire loop and the diamond-shaped wire, but this could vary according to the size of the lesion. Postoperative care was extremely simple. Immediately after Surgitron® excision, there

was simply a raw non-bleeding surface no bigger than the original surface area of the lesion. This formed a scab and 7-10 days later there was a fresh healthy layer of new skin which over time blended into the normal skin colour. During this period patients were instructed to apply Polyfax® skin ointment and allowed shower and normal activity immediately.

Patients were revisited 4 to 6 weeks post-operative, at which time the lesion was examined to ensure its complete removal. Otherwise, a brief touch-up procedure was done at that time. Patients were explained that occasionally freckle-like postinflammatory pigmentation may ensue and that more aggressive treatment might lead to scarring.

Results

55 different facial cutaneous lesions were excised. Of these, 39 were in female and 16 lesions in male patients. The commonest being the skin tags, followed by nevi. The spider facial veins were excised in 3 cases as shown in **Table 1**.

In the majority single session was sufficient. During follow up 2nd session was required by only 5 patients. The overall postoperative aesthetic results were satisfactory in all cases (**Figures 2 and 3**). There were no complications except mild postinflammatory pigmentation.

Discussion

We found Surgitron® very suitable for the small cutaneous lesions of the face. The results were excellent and the patients' acceptance was also good.

The benefits of cosmetic radiosurgery include:

Table 1 Conditions treated (n=55)

Conditions	Number
Skin tags	26
Nevi	12
Seborrheic keratoses	6
Papilloma	4
Hypertrophic scars	4
Spider facial vein	3



Figure 2 Epidermal nevus before treatment



Figure 3 Significant improvement after single treatment.

- Virtually no risk of scarring – the removal occurs at a very superficial skin level
- Minimal damage to surrounding skin
- No bleeding
- Minimal if any pain.

These excellent results can be attributed to the fact that cutting effect known as electrosection is performed without manual pressure or crushing of cell tissue. Though the radio frequency wave is applied by a fine wire surgical electrode, yet heat is generated by resistance to the passage of radiowaves through the tissues. This heat disintegrates and volatilizes the cells in the path of the radio waves. This effects razor sharp, yet bloodless removal of the lesion. As the plane of excision remains superficial scarring is not a problem.

Conclusion

The addition of radiosurgery instrument is a promising tool for the excision of the superficial cutaneous lesion of the face.

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