

Radiosurgery In Proctology Practice

Pravin J.Gupta M.S. ^a

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With the emergence of newer inventions in the era of biomedics and electronics, new avenues in surgical treatment are being put forward. In the field of proctology, Cryosurgery, Photocoagulation, Electro surgery and Lasers are already in use and have changed the scenario of treatment of these ancient diseases.

Recently, radiosurgery has emerged as an exciting tool to deal with all the common ano rectal conditions. Although, it is in a very infantile stage, a continuous work in this area would definitely explore many more new utilities of this equipment.

INTRODUCTION

For the first time, Radiofrequency surgery was used for treatment of snoring and is now being extensively used in the practice of dermatology, cosmetology, neurosurgery and other ENT procedures. Its versatility has been proven beyond doubt. It is both time and cost-effective and has multi-faceted usage in the respective medical field.

But to-date, proctologists have used this instrument very sparingly and that too out of curiosity rather than being very serious in this regard. The reason may be that they were satisfied with the conventional techniques followed by them or were not much convinced about the efficacy of this tool, as not many studies were available describing its usage in the branch of ano rectal surgery.

We have successfully used this instrument in various conditions of the ano rectum and can say with confidence that this could be a better alternative for many proctologic procedures where only the conventional methods are considered safe.

As of today, many radiofrequency units are available, but we preferred the patented Ellman Dual Frequency unit (Ellman International - Hewlett, New York), as the instrument has been well received and appreciated by the dermatologist and cosmetic surgeons. The special feature of this machine is the provision of different types of electrode tips for a variety of applications. What has attracted us most was its simultaneous cutting and coagulation effect, which according to us is the prime need of the procedures within the ano rectal area, which is quite vascular and has a limited accessibility. During the procedure the area of operation can get blurred in case bleeding continues. This problem makes the procedure more difficult and time-consuming. We are using lasers, electrocautery, infra red coagulator and cryo equipment in this field, but in none of these instruments have the characteristics of the above-referred synchronous action.

In radiofrequency surgery there are three choices of electrical waveforms plus a fulguration current. By changing waveforms, one obtains different effects. The settings in the Ellman Surgitron are described as *Filtered Fully Rectified* [pure cutting (CUT mode)], *Fully Rectified* [blended current which is 50% coagulation and 50% cutting (CUT/COAG mode)] and *Partially Rectified* [90% coagulation (COAG mode)]. Apart from this, there is a fourth mode, which is called as *Fulguration* and is used, primarily in large masses to create an electrodesiccation.

Indications Of 3.8 - 4.0mhz Dual Frequency Radiosurgery In Ano Rectal Pathologies

1. Hypertrophied anal papillae
2. External piles
3. Sentinel tags in fissure in ano
4. Perianal warts and condylomata
5. Rectal polyps
6. Fibrous anal polyps
7. Perianal sinuses
8. Post fissure granulomas
9. Perianal papillomas
10. Perianal antibiomas
11. Biopsies
12. Fistula in ano
13. Hemorrhoids.

TECHNIQUES

All procedures are done under general, spinal or a saddle block anesthesia method, as we usually prefer to perform a sphincter dilatation in all the patients before carrying out any procedure. Only perianal warts and papillomas were removed giving a local anesthesia

Although, different types of electrodes are available with the unit, primarily we have used the *Loop Electrode* , the *Ball Electrode* and the *Fine Needle Electrode* .

Hypertrophied Anal Papilla

It is a common finding in most of the cases of chronic fissure in ano and is responsible for minor associated complaints like discharge, a foreign body sensation and occasionally getting trapped in the tight sphincter. These are touched with the Ball Electrode using the COAG mode with a power between 40 and 50. They immediately disappear.

External Piles

May be in an isolated form with no internal pathology or may be a part of an internoexternal pile. In both the cases, they are dealt as an individual entity. If they are small in size, they are coagulated with Ball Electrode with a power of about 50. If they are large enough, they are excised first by making a circular coagulation with Ball Electrode around the mass and then shaving it off with a Large Loop Electrode keeping it in CUT/COAG mode. The bleeders from the base are held with artery forceps and are coagulated with the Ball Electrode in COAG mode. *[It was found that if the pile mass is large and if mere coagulation is done, then it causes a significant edema post-operatively causing a concern to the patient].*

Sentinel Piles in Fissure in Ano

Sentinel pile or tags are a common accompaniment of all the chronic fissures. Many surgeons don't pay any attention to them and leave them untouched while relieving the spasm of the internal sphincter. But, in our opinion and personal experience, these must be removed for two reasons. First, they may interfere with the healing of the fissure and second, they become a cause of concern for the patient that 'something' is still left behind.

If the tag is small, it can be directly coagulated with a Ball Electrode at a power of 50 or 60, but if it is large, then these are excised with Round Loop, securing the bleeding points and coagulating them later.

Perianal Warts and Condylomata

Perianal warts and condylomata are not very common. These are mostly the result of perverted sexual practice and cause perianal soiling and pruritus. They may reach inside the anal canal and can bleed at times.

They can be shaved off using a Diamond Loop Electrode or Round Loop Electrode keeping it in CUT/COAG mode at a power of 30 or 40. Once all of them are removed, the operated area is 'sterilized' by rolling a Ball Electrode on COAG mode to ensure removal of invisible warts and the viral colony. The intra-anal warts can simply be coagulated for better results.

Rectal Polyp

A child is often found to be the common sufferer of rectal polyps. Sometimes adults may also have a large polyp slipping down during defecation and needing a manual repositioning.

These are very vascular, delicate structures and can easily get detached if manipulated causing excessive bleeding thereby obscuring the operative field. It is better if they are dealt with within the anal canal. Through a proctoscope, a longer length Ball Electrode is passed and an encircling coagulation field is created around the base of the polyp. The pedicle is then coagulated until the mass gets separated. This ensures a negligible bleeding which could be secured by touching with the Ball Electrode in COAG mode of power 40. Care is to be taken that a small amount of the mass is delivered undisturbed for histopathological examination.

Fibrous anal polyps

These are nothing but exaggerated anal papillae, which with time attains excessive fibrous thickening, and acquire a rounded expanded tip, which can even be felt on digital examination.

These are coagulated in situ using the Ball Electrode. If large enough, they can be shaved off with a Loop Electrode after coagulation of the base.

Perianal and Parasacral Sinuses

These include the pilonidal sinuses, post anal sinuses and post-traumatic sinuses. They are a source of constant pain, edema and pus discharge.

After doing a sinogram to ensure the tract is blind and has no connection either with bone or ano rectum, the patient is operated under spinal anesthesia in a left lateral position. A methylene blue dye is injected in the opening, which spills out in the sinus tract. An elliptical incision is produced around the boundaries of the indurated area with a Fine Wire Electrode kept at CUT/COAG mode at a power of 60. Areas appearing blue indicate the tract and it's branching, which are sliced off with a Round Loop Electrode. The bleeding points are held with hemostats

and later coagulated with Ball Electrode in COAG mode. The wound is stuffed with gauze and is left for secondary healing. No attempt is made to approximate the wound edges as this could lead to excessive tension. The wound healing in this procedure is excellent and the scarring is minimal.

Post Fissure Granuloma

This usually develops after a fissure in ano gets supplicated. The base of the fissure gets indurated and thickened and becomes a constant source of a foreign body sensation and intermittent pus discharge. It can be felt during a digital anal examination in the form of a tender nodule usually at 6 or 12 o'clock position.

After performing a sphincter dilatation, the granuloma is curetted by frequent sweeps of a Loop Electrode in COAG mode at a power of 60 or 70. After removing the mass, which looks yellow in color, the base begins to ooze. Bleeders can be secured using a Ball Electrode and the cavity is lightly packed for next 24 hours. Complete healing takes about one month, but the new tissue is healthy and strong leading to a complete resolution.

Perianal Papillomas

Being under covered area and rarely becoming symptomatic, these are coincidentally found during other anorectal procedures. If the patient is keen on removing them, they can precisely be removed using a Loop Electrode whose size will be determined by the size of the mass. Occasionally, the raw area requires a touch of a Ball Electrode if oozing is present.

Perianal Antibiomias

A perianal abscess is treated with antibiotics and anti-inflammatory drugs without draining the pus. The abscess cavity becomes 'sterilized', but persists as a lump that intermittently becomes painful and edematous. They do contain sterile pus inside, but seldom burst open.

The aim of treatment is to saucerize the complete cavity, which can be achieved by incising the center using a Fine Wire Electrode in CUT/COAG mode. All the granulation tissues, which feel hard with little bleeding, are scrapped out with a Round Loop Electrode until a soft red base is reached. The bleeding points are secured and the wound is left without attempting any primary closure.

Biopsies

Biopsies can be performed for suspected growths in and out of the anus. A Round Loop Electrode is best tool, which is used on a pure CUT mode so that the histology is not distorted due to lateral heat. A brisk bleeding is encountered from the base, which could be compressed for a few minutes and then coagulated with Ball Electrode.

Fistula in ano

The Ellman Dual Frequency has been found to be the most exacting and effective in operating fistula in ano. In 12 months, we have operated on 136 cases of fistula in ano of varied types exclusively with radiofrequency, and could achieve a suture-less procedure in more than 120 cases.

The versatility of this instrument is its biggest asset in performing this surgery. The ease of operation, minimal bleeding, a short procedure time and early recovery of the patient are but few of the highlights of radiofrequency fistulotomy.

After getting a fistulogram to assess the length of the tract and its associated branching etc, the patient is operated on under spinal anaesthesia if the fistulous opening is away from the anal verge and under a short general anaesthesia if the external opening is within 1 cm of the anal verge.

The patient is kept in a lithotomy position. Viewing through an anoscope, methylene blue dye mixed with hydrogen peroxide is injected through the external opening, which comes out from the internal opening. A probe is passed through the external opening and thrust out of the anal canal through the internal opening.

With a Fine Wire Electrode on CUT/COAG mode, the tract is split open over the probe. Two tissue forceps are applied at the edge of the wound and with a Round Loop Electrode, the complete tract is shaved off. The bleeding points are held in the hemostat and later coagulated. Once the complete thick indurated mass comes out, the whole raw area is uniformly coagulated using a Ball Electrode on a COAG mode to ensure that no infected element is left behind. The wound is washed with antiseptic solution and lightly packed with gauze. The packing is removed after 24 hours. The area is then cleaned and an antiseptic applied. No special dressing is required. The wound is covered with sanitary pad to absorb the discharges.

The patient is usually discharged after 48 hours and called every 15 days. No specific dressing is needed except a warm sitz bath twice a day and application of antiseptic ointment. The wounds usually heal in 2 months.

There is less chance of infection as the wound remains open and the patient himself can feel the progress of the wound healing.

With the emergence of 3.8MHz - 4.0MHz radiofrequency, we have not operated a single case of fistula in ano using the conventional methods, as there is no comparison between the two. In our opinion this procedure is perhaps the best amongst all available for effective management of fistula in ano.

Hemorrhoids

In both the types of hemorrhoids, i.e., the early degree of non-prolapsing piles as well as the prolapsing one can be nicely dealt with radiofrequency coagulation. While the internal piles were directly coagulated in situ with the ball electrode with a long length, the prolapsing piles can be first ablated with ball electrode and then plication of the whole pile mass is carried out. This makes the procedure very simple, easy, without a need to excise or remove the pile mass with a very meager bleeding.

POST-OPERATIVE CARE

Patients in most of the mentioned cases can be discharged on the very same evening. They are given analgesics, antibiotics and stool softeners for about 10 days. No specific wound care is needed except a warm tub bath twice a day and application of a soothing ointment mostly containing a local anesthetic. The patient is called after 2 weeks for review.

The wound usually takes 2-4 weeks to heal completely except in case of fistula, which takes slightly longer time.

COMPLICATIONS

No major complications were encountered. Few minor ones are discussed below.

1. Deep dissection causing more scarring and longer time for healing.

2. Excessive power causing more smoke and charring.
3. Accidental burns either on the patient or operator due to unintended activation of hand piece.
4. Edema in the surrounding tissue if power is too high.
5. Excessive discharge from the open wound due to greater destruction of the tissues at the base.

COMPARISON WITH OTHER EQUIPMENTS

We have also used infra red coagulator, cryogun, CO2 laser, electrocautry and traditional surgical procedures for the mentioned ailments. A brief account of their comparison with the radiofrequency is as below.

4.0 MHz RADIOFREQUENCY	ELECROSURGERY
Can cut and coagulate simultaneously	Requires different modes and adjustment for different applications
Minimal smoke production	Produces excessive smoke
Minimal tissue damage	Greater tissue damage
Faster healing	Prolonged healing
4.0 MHz RADIOFREQUENCY	CRYOSURGERY
Tissue interaction can be pre-determined with power setting selection	No precision of resulting tissue damage
No tissue adherence or charring	Probe occasionally sticks to application area causing the tissue to get detached
Minimal edema and discharge	Gross post-procedure edema and profuse discharge
Final result is seen immediately	Uncertainty of end result due to variable tissue response
4.0 MHz RADIOFREQUENCY	CO2 LASER
Adaptable for multiple applications	Limited applications in ano rectal diseases
Equally good results for cutting and coagulation	Good cutting effect but poor coagulation
Less expensive	Expensive
Portable	Limited mobility

Inexpensive treatment	Costly treatments
Easily used through proctoscope	Difficult to use through scope

Compared to the conventional scalpel surgery, radiofrequency method simply outshines on all avenues like effortless tissue excision with negligible bleeding thereby providing a clean operative field, usage in depth and in difficult areas like the anal canal. Minimal incidences of postoperative infection, faster wound healing and negligible use of sutures etc.

CONCLUSION

Based on our personal experience and looking at all the above aspects, we feel that Radiofrequency surgery is an ideal alternative to many of the conventional ano rectal procedures for the following reasons;

1. Minimal tissue trauma, leading to less intra and postoperative complications.
2. Versatility of usage due to different types of electrodes available.
3. Less postoperative pain and edema.
4. Safety of the procedures.
5. No special operation theatre or arrangements needed.
6. Cost effective.
7. Better and faster healing.
8. Portability of the equipment. Can be easily carried by the surgeon. The portability of this instrument makes it ideal for organizing surgical camps in the remote area for the larger benefits of the suffering masses.
9. Low maintenance cost.

Reference:

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Questions to the reader:

Do you think anal papillae are common findings associated with chronic fissure in ano?

item_1|Yes **Yes** item_1|No **No**

Is it the pain which compels the patient to seek medical advice in ano rectal diseases?

item_2|Yes **Yes** item_2|No **No**

Do you think proctology is a branch of medical science which is not paid the same attention as the other branches.?

item_3|Yes **Yes** item_3|No **No**

E-Mail Address

Comments if any

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Authors:

^a **Pravin J.Gupta** M.S. , Proctologist, Gupta Nursing Home, D/9, Laxminagar, NAGPUR-440022, INDIA.

E-Mail: drjpg@yahoo.co.in

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