



## 3.8-4.0MHz RADIOFREQUENCY SURGERY AN EXPERIENCE IN PROCTOLOGY

Pravin J. Gupta, M.S., M.B.B.S.  
Nagpur, India

**R**adiofrequency surgery, which was for the very first time used for treatment of snoring, is now being extensively used in the practice of dermatology, gynecology, neurosurgery, and other otorhinolaryngological procedures. Its versatility has been proven beyond doubt. It is both time and cost-effective and has multi-faceted usage in the respective medical fields.

To-date, proctologists have used this instrument very sparingly and out of curiosity rather than embracing the technology for the many benefits it affords. The reason may be that they were satisfied with the conventional techniques acquired during their training or were not convinced about the efficacy of this tool, as not many studies were available describing its usage in the area of ano rectal surgery.

I 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 have been considered safe.

As of today, many low radio frequency (RF) units are available, but I preferred the patented high frequency Surgitron unit (ellman International, Oceanside, 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. I have found most attractive the simultaneous cutting and coagulation effect, which is essential in the procedures within the ano rectal area being vascular and having limited accessibility. During the procedure, the area of operation can be blurred if bleeding continues making the procedure more difficult and time-consuming. I have available lasers, electrocautery, infra red coagulator, and cryo equipment, but none of these instruments have the characteristics of the synchronous action of cutting and coagulation.

In radiofrequency surgery, there are three choices of electrical waveforms plus a Fulguration current. By changing waveforms, one obtains different tissue effects. The settings in the ellman Surgitron are described as Filtered Fully Rectified [98% 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 Fulguration and is used primarily in large masses to create an electrodesiccation.



### INDICATIONS OF 3.8 - 4.0MHz 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

### TECHNIQUES

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

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

### HYPERTROPHIED ANAL PAPILLA

A common finding in most of the cases of 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 4 and 5. They immediately disappear.

## EXTERNAL PILES

Maybe 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, they are coagulated with a Ball Electrode using a power of about 5. 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 in the 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 significant post-operatively edema.]

## SENTINEL PILES IN FISSURE IN ANO

Sentinel pile or tags are a common accompaniment of all the chronic fissures. Many surgeons do not pay any attention to them and leave them untouched while relieving the spasm of the internal sphincter. In my 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 5 or 6, but if it is large, then these are excised with a Round Loop, securing the bleeding points and coagulating them later.

## PERIANAL WARTS AND CONDYLOMATA

Perianal warts and condylomata are not very common. I find that 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 3 or 4. 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 vascular, delicate structures and can easily be 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 is separated. This ensures a negligible bleeding which could be secured by touching with the Ball Electrode in COAG mode on a power 4. 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 by using the Ball Electrode. If large enough, they can be shaved off with a Loop Electrode after coagulation of the base.

## PERIANAL AND PARA SACRAL 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 sonogram 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 at CUT/COAG mode on a power of 6. 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 a 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 is suppurated. The base of the fissure is 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 6 or 7. 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 is determined by the size of the mass. Occasionally, the raw area requires a touch of a Ball Electrode if oozing is present.

## PERIANAL ANTIBIOMAS

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. Brisk bleeding may be encountered from the base, which could be compressed for a few minutes and then coagulated with Ball Electrode.

## FISTULA IN ANO

The ellman Surgitron has been found to be the most precise and effective in operating on fistula in ano. In 12 months, I have operated on 216 cases of fistula in ano of varied types exclusively with radiofrequency, and could achieve a suture-less procedure in more than 210 cases.

The versatility of this instrument is its greatest 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 fistulectomy.

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

The patient is kept in a lithotomy position. Viewing through an anoscope, methylene blue dye 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 ensue 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, I have not operated a single case of fistula in ano using the conventional methods, as there is no comparison between the two. It is my opinion that this procedure is perhaps the best amongst all available for effective management of fistula in ano.

## POST-OPERATIVE CARE

Most patients 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 during my use of the Surgitron. 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.

## TECHNOLOGY COMPARISONS

I have also used infra red coagulator, cryogun, CO2 laser, electrocautery, and traditional surgical procedures for the mentioned ailments. A brief comparison with radiofrequency follows.

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 my personal experience and looking at all the above aspects, I 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.

I find the ellman Surgitron having extensive applications with precise, predictable results. I am confident this 3.8MHz-4.0MHz-radiofrequency technology will gain expanded acceptance and emerge as a useful tool in the field of anorectal surgery.

4.0 MHz RADIOFREQUENCY	INFRA-RED COAGULATION
Multifaceted application/use	Single application of coagulation the internal bleeding piles only
Can coagulate, cut or fulgurate	Coagulation only
4.0 MHz RADIOFREQUENCY	ELECTROSURGERY
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

#### About the Author

Dr. Pravin Jaiprakash Gupta, M.S., M.B.B.S., served as a senior resident in surgery and lecturer in the Government Medical College in Nagpur. Presently, Dr. Gupta is a consultant in Proctology and is running a private nursing home, which includes a 10-bed hospital, restricted to ano rectal surgery. Treatment interventions are of high-tech including 3.8MHz- 4.0MHz radiofrequency technology.

To-date, Dr. Gupta has performed over 3 thousand cases of ano rectal diseases. Area of expertise is suture-less fistulectomy using 3.8MHz-4.0MHz radiofrequency technologies. 225 cases of fistula in ano have been successfully performed in the past 12 months using this new technique.

Gupta Nursing Home,  
D/9, Laxminagar,  
NAGPUR- 440022  
INDIA.  
Email: drjpg@yahoo.co.in

*This surgical technique guide is provided by **ellman international** for informational purposes only. It is recommended that each surgeon develop their own parameters for the Surgitron unit based on experience with different tissue types, individual surgical technique and post-operative results.*

*Doctor Gupta has no financial interest in ellman international, inc.*

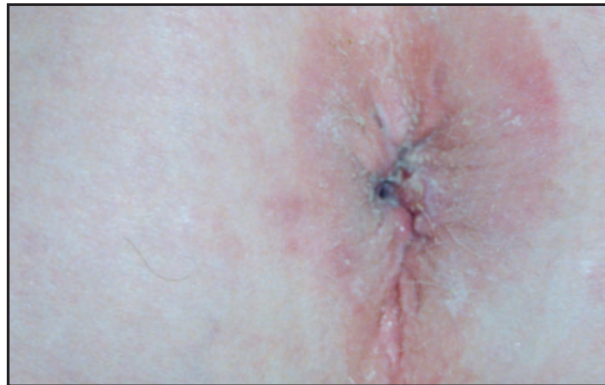




Prolapsed Thrombosed Piles



Post RF Excision / Coagulation



One Month Post-op



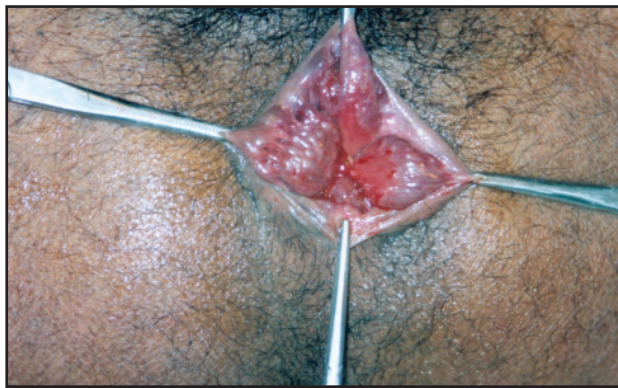
Post Fissure Granuloma



RF Coagulation with Ball Electrode



Post Procedure Result



Internal Piles



Post RF Coagulation



Hypertrophied Anal Papilla



Coagulation by Ball Electrode

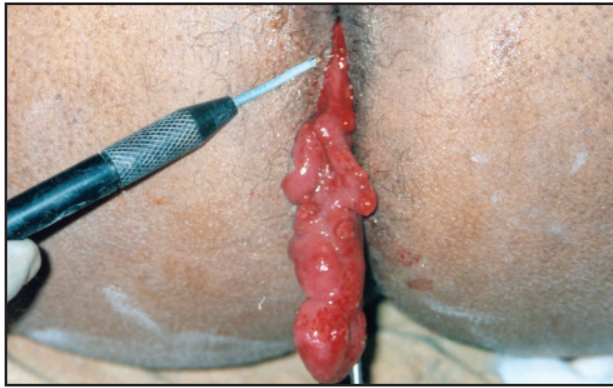


Submucous Antibioma at 6 O'clock as seen from Proctoscope



After Curage & RF Coagulation by Loop and Ball Electrode





Excision of Rectal Polyp by Loop Electrode



Coagulation of Polyp Pedicle by Ball Electrode



Perianal Papilloma



Post RF Excision



External Pile



Post RF Excision