

RADIO FREQUENCY FISTULOTOMY: A NEW APPROACH FOR THE TREATMENT OF ANAL FISTULA

Radyofrekans Fistülotomi: Anal fistül tedavisinde yeni bir yaklaşım

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Abstract

Purpose: While several techniques are available to treat anal fistula, the majority of surgeons continue to prefer the classical lay open technique [fistulotomy] as a gold standard in its treatment. In this paper, the author describes his experience of fistulotomy using a radiofrequency device.

Patients and Methods: An Ellman radiofrequency generator was used to perform this procedure. This retrospective study describes the procedure and its outcome in 188 patients of low anal fistula operated on over a period of 2 years and followed up for an equal duration thereafter.

Results: The mean duration of incapacity for work was 5 days. The complete wound healing took a mean period of 48 days [range 32-95 days]. While 7 patients had a delayed wound healing, none of the patients suffered from anal incontinence. The recurrence/ failure rate was very low (2.2%)

Conclusion: The technique of anal fistulotomy using a radiofrequency device is a simple, safe and cost effective procedure. The hospital stay duration is short, with an early return to work. Postoperative complications and recurrence rates are favorably comparable with other techniques.

Key Words: Anal fistula; catheter ablation; recurrence; fecal incontinence.

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Özet

Amaç: Anal fistül tedavisinde kullanılabilen bir kaç tekniğin varlığına karşın, cerrahların çoğu klasik "lay open" tekniği (fistülotomi) tedavide altın standart olarak tercih etmeye devam etmektedirler. Bu çalışmada yazar, bir radyofrekans cihazı kullanarak gerçekleştirdiği fistülotomi tecrübelerini tanımlamaktadır.

Hasta ve Yöntem: Tanımlanan prosedürü gerçekleştirmek için bir Ellman radyofrekans jeneratörü kullanıldı. Bu retrospektif çalışmada 2 yıllık bir süreçte opere edilen ve daha sonra aynı süre boyunca takip edilen 188 anal fistül olgusunda gerçekleştirilen prosedür ve sonuçları tanımlanmaktadır.

Bulgular: Olguların iş yapamama sürelerinin ortalaması 5 gündü. Tam yara iyileşmesi 48 günlük (32-95 gün) bir süreci gerektirdi. Yedi hastada gecikmiş yara iyileşmesi saptanırken, hastaların hiç birinde anal inkontinans saptanmadı. Nüks / yetmezlik oranı çok düşük (% 2.2) olarak bulundu.

Sonuç: Radyofrekans cihazının kullanıldığı anal fistülotomi tekniği basit, güvenli ve uygun maliyetli bir prosedürdür. Hastanede kalma süresi kısadır, hastalar günlük yaşamlarına hızla dönerler. Postoperatif komplikasyonları ve nüks oranı diğer tekniklerle karşılaştırıldığında uygundur.

Anahtar kelimeler: Anal fistül; kateter ile çıkarma; nüks; dışkı inkontinansı.

INTRODUCTION

The lay open technique [Fistulotomy] is still the most favored procedure for the treatment of anal fistula (1). Slitting open the entire tract from the external to internal opening is the basis of traditional fistulotomy. Tissues around the external and internal openings are excised along with a small margin of tissue lining the tract, while the wound is kept open for healing by secondary intention (2).

The conventional fistulotomy is performed keeping the patient in a lithotomy or a jack-knife position. On palpation, the tract can be felt as a nodule or a cord like structure extending from the external opening to the anal canal. A hypertrophied anal papilla could be found located at the point of internal opening on anoscopic examination.

Negotiating a director probe delicately from the internal or external opening of the fistula can delineate the tract. Another method is that instilling methylene blue or milk mixed with hydrogen peroxide from the external opening, which can locate the direction and path of the tract (3).

With the director probe in the tract, the complete tract is cut wide open to expose the tract tissues, which are scooped out or curetted. The edges of the wounds then are trimmed to remove approximately 1-3 mm of tissue margins. The wound is usually left open to heal by granulation.

While a surgical knife or electrocautry is used in conventional fistulotomy, we have used a radiofrequency device called Ellman Dual Frequency 4MHz radiofrequency generator. [Ellman International, Oceanside, N.Y.]. In this procedure, we used a needle electrode to incise the tract, a loop electrode to reshape the wound edges and a ball electrode to coagulate the bleeding points.

The aim of this study was to assess the advantages, if any, offered by this technique over the other treatment methods for anal fistula.

PATIENTS AND METHODS

Between July 1999 and June 2002, 188 patients (137 males, 51 females) with low anal fistula were operated on in our hospital using the radio frequency device. The mean age of the patients was 37 yrs [range: 22-63 yrs]. The mean duration of the disease was 19 months [range: 4 months- 11yrs]. Seventeen patients had been operated on for fistula once before and they had been admitted with a recurrence.

Only low fistulas with the internal opening below the anorectal ring were included in the study. High trans-sphincteric fistulas (with or without high blind tract), suprasphincteric, extrasphincteric, and horseshoe fistulas (also fistulas associated with inflammatory bowel disease) were excluded.

The patients were operated on under a short-term general anesthesia or a caudal block, at the discretion of the anesthesiologist. Informed consent was obtained from all patients before this new technique was employed. The procedure was approved by the Local Ethics Committee and was performed in line with Helsinki Declaration.

Radio frequency fistulotomy procedure

After injecting the methylene blue mixed with hydrogen peroxide to identify the tract, a director probe was inserted in the fistula from the external opening to pass through the tract till its tip emerged out from the internal opening. The skin overlying the probe was coagulated by moving the ball electrode over its complete length. This helped in reducing the amount of bleeding when the tract was slit open. The skin and underlying tissues covering the fistulous track were then laid open along the probe with the help of the needle electrode of the radiofrequency device. This maneuver was almost bloodless and without any drag on the tissues.

The wound edges, as well as the surrounding infected and fibrotic tissues were shaved with the loop electrode of the device. As the cut and coagulation were achieved simultaneously, brisk bleeding that is often encountered during the conventional knife and scissors dissection was obviated. The shaving of the wound edges was carried out in such a way that it produced a pear-shaped wound tapering towards the anus. This avoided premature approximation of the wound edges during the course of healing of the underlying wound.

The radiofrequency device may also be used in the treatment of anal skin tags, sentinel piles or internal hemorrhoids which may occasionally be found present with the fistula. (4)

Post-operative care

Diclofenac sodium 50 mg was prescribed for five days and ofloxacin 400 mg once a day for 10 days after the procedure. No special wound care was needed except for a warm water sits bath advised twice a day. An absorbent pad was used to cover the wound. The patients were examined 6 hours after the procedure and were then discharged on reporting comfortable and with no complaint. They were called for follow-up every 2 weeks until the wound healed.

RESULTS

The patients were followed up for a minimum of 2 years after the procedure.

A mean time duration of 48 days was needed for complete epithelization of the wound [range 32-95 days]. The average duration of incapacity for work was 5 days [range 3- 13 days]. The mean analgesic requirement was 18 tablets of Diclofenac [range 14-31 tablets]. In 7 patients, delayed wound healing was observed where the wounds took about 80-108 days for complete healing. It was observed that the wounds on either side of the midline were slow to heal in comparison to the wounds present elsewhere.

Four patients reported a premature closure of the proximal wound with the distal wound remaining unhealed. In them, the healed proximal edges were again slit opened with the needle electrode under local anesthesia. Wounds of three patients from this group healed uneventfully there after, while the fourth one continued with a discharge from the small wound left behind. Despite repeated attempts, the wound in this case failed to heal. Ultimately, this patient was labeled as a case of 'failure of wound healing', rather than a recurrence.

In two cases of the operated patients, the histopathological report suggested the presence of tuberculosis. Antitubercular medication with a standard protocol was prescribed. Both of them had an uneventful recovery.

None of the patients operated with this technique had any interference with anal continence. None had developed anal stenosis or mucosal prolapse. On the last follow-up, 3 patients did report with recurrence of fistula.

DISCUSSION

A variety of treatment options have been proposed for the treatment of anal fistula. These include fistulectomy (5), fistulotomy with marsupialisation (6), curettage of fistula and placement of flaps of mucosa or skin (7), open coring out [function preserving] technique (8), placement of medicated setons (9), insertion of antibiotic beads, and injection of commercial or autologous fibrin glue (10). In spite of the availability of such options, majority of surgeons still rely on the classical lay open technique [fistulotomy] in dealing with fistula- in-ano (11) . Table 1 summarized the results of surgical procedures for anal fistula.

The patient satisfaction after surgical treatment of anal fistula is counted on factors such as period of hospitalization, postoperative pain, return to routine activity, need for special wound care, the duration of wound healing period, interference with anal continence adversely affecting patient's lifestyle and most importantly, the recurrence of the disease (12). On all these fronts, the technique used by us has measured up to be more effective than the conventional fistulotomy in the sense that the operative time is less than half of the conventional techniques, intra-operative bleeding is negligible, and the use of suture material is altogether dispensed with. The period of hospitalization is less than a day with duration of lay off being less than a week.

The wound healing is quick with no need for any special wound care. While none of the patients in our study had any interference with the continence, the failure of wound healing/recurrence rate was as low as 2.2%.

Radio frequency surgery should not be confused with electro surgery, diathermy, spark-gap circuitry, or electrocautery. Unlike electrocautery or diathermy, which works on the frequency between 0.5 to 1.5 MHz, radiofrequency uses a very high frequency current of 4 MHz. Therefore, unlike the electrocautery, the electrode used in radiofrequency remains cold during its application (13). This allows the surgeon to work in direct proximity of the functional tissues that needs to be preserved(14).

As contrast to true cautery, which causes damage similar to 3rd degree burns, the tissue damage that does occur with radiofrequency is superficial and is comparable to that which occurs with lasers. The radiofrequency device allows cut and coagulation of tissues in an atraumatic manner in contrast to the traditional electrosurgical devices. With radiofrequency, the targeted tissue temperatures stay localized within a 60-90 °C range thus limiting heat dissipation and damage to adjacent tissue to permissible levels. In juxtaposition, electrocautery, diathermy, or laser temperatures are significantly higher (750-900 °C) which result in significant heat propagation far in excess of the desired therapeutic needs (15). While techniques, using conventional scalpel apparently works in an atraumatic way, the prominence of bleeding from the wound forces the surgeon to coagulate the bleeders more frequently using traditional electrocautery or diathermy, which results in excess tissue assault and the resultant complications.

Histologically, it has been shown that tissue damage with radio frequency surgery is actually less than with a conventional scalpel and equals cold scalpel (16). As radio frequency surgery creates minimal collateral heat damage in the tissue the wound healing is rapid and the scar is soft and supple (17).

Rapidity of treatment, a nearly bloodless field, minimal postoperative pain, and rapid healing are but few advantages of radio frequency surgery (18). Once proper technique is established, a scar by this method of treatment is often less pronounced than that produced by other surgical techniques (19).

The possible reasons for failure of fistulotomy wound to heal or for recurrence of the disease are multiple. While premature union of the skin edges, failure to excise the internal opening, and failure to locate an extra tract are the prime causes, failure to detect a cavity leading upwards from the main tract, presence of foreign bodies and poor wound care are few others to mention (20). It is difficult to explain why there was a delay or failure of wound healing for the wounds present in the midline in patients from our study, it could possibly be attributed to excessive exertion during routine or a relatively lesser blood supply in that area.

It can be concluded that radio frequency surgical technique is effective in achieving an effortless tissue excision with negligible bleeding and thereby providing a clean operative field for the surgeon to be precise in his maneuvers. It allows usage in deep and difficult areas like the adjoining tracts. The treatment is cost effective as compared to the conventional one due to reduction in hospital stay and a reduced period off work. While it is agreed that more controlled and randomized studies comparing this technique with other techniques of fistulotomy are needed to establish the utility and advantages of the radiofrequency fistulotomy, the initial results are positively encouraging.

Table 1- Comparative evaluation of results of various surgical techniques for anal fistula and radiofrequency fistulotomy.

Success rates with different treatment techniques for anal fistula	
Fibrin Glue (10)	0-100%
Sphincter preserving techniques (21)	95%
Excision and closure of wound (24)	79%
Cutting seton technique (22)	71%
Endo-rectal advancement flap (23)	63.3%
Radiofrequency fistulotomy	97.8%

Mean wound healing duration with different surgical techniques for anal fistula	
Excision and marsupialization (25)	42 days
Medicated seton (26)	58 days
Cutting seton (9)	63 days
Lying open (25)	70 days
Radiofrequency fistulotomy	48 days

Impairment of continence (in % of patients)	
Excision and marsupialization (25)	2%
Fistulotomy (11)	10%
Excision of fistula with closure of internal opening (24)	11%
Lying open of fistula (25)	12%
Radiofrequency fistulotomy	None

Premature approximation of wound edges (in % of patients)	
Fistulotomy (27)	16.7%
Radiofrequency fistulotomy	2%

Delayed wound healing (in % of patients)	
Open 'Coring out' technique (8)	7%
Radiofrequency fistulotomy	4%

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