OBJECTIVE: The aim of this paper was to analyze the results of treatment of anal fistulas using a radiowave device retrospectively.

METHODS: Between 2000 and 2008, 976 patients were operated on for perianal fistula. An Ellman radiowave generator was used to carry out the complete surgical procedure. In the follow-up period 155 patients were lost, remaining 821 patients were analyzed in the study. The mean follow-up time was 6.8 years. Analyzed parameters included: postoperative complications, wound healing time, off work duration, recurrence rate and incidence of anal sphincter dysfunction. Severity of gas and stool incontinence was assessed.

RESULTS: In our study, subcutaneous fistula was diagnosed in 28.1%, inter-sphincteric in 39.1%, and trans-sphincteric in 32.8%; supra-sphincteric and extra-sphincteric fistulae were not included in the study. Single-tract fistulas were present in 85.4% and multi-tract fistulas were present in 14.6%. Postoperative complications were noticed in 1.4% of patients, which included postoperative bleeding, abscess formation, premature approximation of skin edges, prolapse of hemorrhoids and local skin allergic reactions. Postoperative gas and/or stool incontinence was noticed in 3.8%. The recurrence rate was 1.7%.

CONCLUSIONS: Radiowave fistulotomy offers short operation time, less postoperative pain, early return to normal activity, and faster healing of the wound. The recurrence rate and continence disturbances are comparable to conventional fistulotomy procedures.

Keywords- Anal Fistula, fistulotomy. Radiowave. Recurrence. Incontinence.

INTRODUCTION

Anal fistula is one of the most frequently treated anorectal diseases. It is estimated that more than 20 percent of the ano-rectal interventions involve treatment of anal fistula. The aim of anal fistula treatment includes preservation of continence while eradicating the suppurative process. The fear of recurrence and impairment of continence following an operation of fistula in ano had compelled the surgeons to explore use of a variety of diagnostic aids to identify the offending tracts and an equal number of surgical and non-surgical procedures to reduce these risk factors. Despite all these attempts and with the trial of variety of other options, majority of surgeons still prefer the classical lay open technique "fistulotomy" as the gold standard of treatment in anal fistula.

We are using radiowave technique to perform anal fistulotomy since last 8 years and found it to be quite effective in terms of operative time, postoperative pain, time of healing and recurrence. Few pilot studies on radio-wave fistulotomy and studies comparing conventional fistulotomy and radiowave fistulotomy have already been published. This paper analyses the long-term outcome of this approach for the treatment of anal fistula.

PRINCIPLES OF RADIOWAVE SURGERY

Radiowave unit generates a very high frequency radio wave of 4 MHz. The unit includes a plastic covered ground plate or antenna, and a patient electrode attached to a handle to be held by the operating surgeon. No electrical contact needs to be made between the patient and the ground plate, unlike operating theatre diathermy equipment. Radiowave thermal ablation works by converting radiowave waves into heat. The alternating current passing down from an uninsulated electrode tip into the surrounding tissues generates changes in the direction of ions and creates ionic agitation and frictional heating. The tissue heating then drives extracellular and intracellular water out of the tissue, which results in the final destruction of the tissue as a result of coagulative necrosis which can execute both cutting and coagulation effects. Unlike the electrocautery or diathermy, the electrode tip remains cold.
The unit is provided with a handle to which different electrodes could be attached to meet exact requirements of the procedure.\(^9\) We used a ball electrode, a round loop and a fine needle electrode in performing fistulotomy.

**MATERIAL AND METHODS**

The diagnosis of anal fistula was made on preoperative clinical judgment. In cases, where clinical diagnosis was doubtful, endoanal ultrasound was done. Such assessments helped to evaluate both the complexity of the fistula and its suitability for inclusion in the study. In none of the patients, probing or fistulogram was used as a method of establishing pre operative diagnosis.\(^10\)

We followed Parks classification to describe the primary track (intraspincteric, interspincteric, trans-spincteric, supraspincteric and extraspincteric) and numerous types of secondary extensions.

An informed consent was obtained from the patients. An Ellman International – oceanside, New York, USA\(\)C Dual Frequency 4MHz radiowave generator was used for this procedure. (Figure 1)

**PROCEDURE OF FISTULOTOMY USING RADIO WAVE DEVICE**

Anesthesia, chosen by the anesthesiologist with the patient’s consent, was general, epidural, sacral-epidural or subarachnoid; some patients received only local anesthesia with sedation.

The procedure was performed keeping the patient in a lithotomy position. With a Park’s retractor in the anal canal, methylene blue mixed with hydrogen peroxide was injected through the external opening. The dye emerged out from the internal opening. Addition of hydrogen peroxide helped opening up the tract.\(^11\) A probe was then gently passed through the external opening and was brought out of the anal canal through the internal opening. Keeping the probe in the fistula tract, the tract was slit opened along the length of the probe. Two tissue forceps were applied at the edge of the wound and with a loop electrode, the complete tract was shaved off. The slit edges of the internal opening of the fistula were coagulated with the ball electrode.

The patients were discharged on the evening of the procedure and were called in the office every 2 weeks for a review. We investigated period off work, time of healing of the wound, fistula recurrence, incontinence to gas, liquid stool and solid stool, soiling and use of a pad (scored as- always, sometimes, occasionally or never).

**RESULTS**

The retrospective data of 976 patients of anal fistula operated in our hospital over a period of 8 years from July 2000 onwards is as follows.

At surgery, patients had a mean age of 39.6 years (median, 41 years; range, 5–81 years); 643 patients (65.8 %) were males. Mean age of the male patients was 43.1 years (median, 42; range, 5–81 years); mean age of the female patients was 36.1 years (median, 34; range, 16–68 years).

**DISCUSSION**

In earlier days surgeons were reluctant to incise the skin and subcutaneous tissues with electro surgical instrument under a belief that these devices increase devitalized tissue with the wound which in turn leads to increased
wound infection, increased scarring and delayed wound healing. With the development of very high frequency electrosurgical units, which are capable of delivering a pure sinusoidal current, most of these lacunae have been overcome. This has generated a renewed interest in the field of electrosurgery.

Our study has demonstrated significant advantages of incising the tissues by use of radiowave namely shorter operating time, reduced postoperative pain and edema due to sealing of lymphatics.

As the radio surgical tool performs coagulation of the small bleeding vessels while the tissue is being cut; the oozing from raw and friable tissues is much less when compared with the conventional scalpel dissection.

The radiowave procedure uses high frequency 4MHz radio waves instead of heat to cut and coagulate tissues and thereby excludes the burning effect that is common with traditional electro surgical devices, cryosurgery, and cautery equipment. Radiowave surgery has been found successful in sealing the sensory nerve endings and the leaking lymphatic. Because of the low level of tissue destruction and controlled direction of the radio wave current, there is an appreciable fall in the amount of postoperative pain. With the reduced intensity and duration of pain, the patients need fewer doses of analgesics. This also encourages early return to work.

Radiowave fistulotomy causes lesser amount of destruction of the surrounding sphincter tissues and the incidence of functional impairment like incontinence is negligible.

Due to the precise functioning of the radiowave equipment, a very little normal tissue is removed or damaged while removing the offending tissues. It could possibly be termed as a minimally invasive procedure than conventional procedure in the process of removal of the affected tissues.

It has been proved that the anal fistulae begin from cryptoglandular infection, which can spread to the intersphincteric space and then pass through the anal sphincter. Our practice of dividing and coagulating the edges of the internal opening of the fistula served two purposes; namely, the cryptoglandular tissue was obviated and the fringe of anoderm between the anus and wound was ablated which apt to become edematous and painful during the postoperative course.

The radiowave device allows cutting and coagulation of tissues in an atraumatic manner, contrary to the traditional electrosurgical devices. With radiowave, the targeted tissue temperatures stay localized within a 38-70°C range thus limiting heat dissipation and damage to adjacent tissue. In contrast, electrocautery, diathermy or laser temperatures are significantly higher (750-900°C) which result in significant heat propagation in excess of the desired therapeutic need.

CONCLUSION

It can be concluded that radiowave fistulotomy is effective in achieving an effortless tissue excision with negligible bleeding and thereby providing a clean operative field for the surgeon to be more precise in his maneuvers. It allows usage in deep and difficult areas like the adjoining tracts. The wound healing is quicker. The recurrence or failure rate of the procedure is very low. The treatment is cost effective as compared to the conventional one due to reduction in hospital stay and reduced period off the work.

SUMMARY

ANALNA FISTULOTOMIJA UPOTREBOM RADIOTALSANOG GENERATORA

Cilj: Cilj ovog rada je retrospektivna analiza rezultata tretmana analnih fistula korišćenjem radiotalasnog aparata.


Rezultati: U našoj studiji, subkutane fistule su najdane kod 28.1%, intersfinkterične kod 39.1% i transsfiinkterične kod 32.8%, a supra sfinkterične i transsfiinkterične nisu bile uključene u studiju. Jednokanalne fistule su najdane kod 85.4%, a komplikovane fistule su najdane kod 14.6%. Postoperativne komplikacije su vidjene kod 1.4% pacijenata, a ovo prelako potvrđuje saslušene posle, stopa recidiva i inkontinencije stolica i gasova.

Zaključak: Radiotalasna fistulotomija nudi kratko vreme operacije, manje postoperativnih bolova, rani povratak normalnih aktivnosti i brže vežanje rana. Stopa recidiva i inkontinencija mogu se porediti sa konvencionalnim fistulotomskim procedurama.

Ključne reči: analna fistula, fistulotomija, radiotalasi, inkontinencija

REFERENCES