

ORIGINAL ARTICLE

A comparison of two operations for pilonidal sinus disease

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Abstract

Background: Postoperative wound complications have always been the main cause of concern followed by the risk of recurrence, in the surgical treatment of the pilonidal sinus disease. Various techniques evolved so far mainly aimed at solving these problems. This clinical study compares the results obtained through random allocation of patients between those subjected to, a) using the excision and marsupialisation technique and b) the technique of excision of the sinus tracts using a radiofrequency device.

Methods: A total of 28 patients of chronic pilonidal sinus disease were randomised to undergo radiofrequency sinus excision technique (n=14) or excision and marsupialisation (n=14). The demographic data, postoperative results, complications and recurrence were documented for comparison of the results. Patients from both the groups were recalled after 12 months to assess recurrence.

Results: Radiofrequency technique resulted to reducing the execution time (13 versus 34 minutes) as well as the hospital stay (9 versus 30 hrs). The postoperative pain (p=0.0044) and period off work (p=0.0019) was more with the marsupialisation technique. Two patients from marsupialisation developed wound infection. At subsequent follow-up, there was one case of recurrence in each group.

Conclusion: In dealing with a limited, chronic pilonidal disease, the radiofrequency sinus excision technique has definite advantages over sinus excision and marsupialisation technique. It needed a shorter hospital stay with reduction on postoperative pain and early resumption to work.

Key words: Pilonidal sinus, excision and marsupialisation, radiofrequency surgery, recurrence

Introduction

Many different approaches have been put forth ranging from a conservation treatment¹ to an extensive surgical excision for pilonidal diseases. But none proved successful in eliminating the complications attendant to such procedures, like delayed wound healing, infection and the rate of recurrence.

Radical excision is one such procedure, wherein the sinus tracts are excised along the surrounding tissue up to the pre-sacral fascia. The debate, however, revolves round the mode of manner of reconstruction of the large wound left behind after the procedure. It is often left alone to heal by granulation, which takes a long time and needs regular dressing and meticulous wound care.

Excision with primary closure obviates a large wound but in the process, the chances of wound infection; wound dehiscence and recurrence are very high.² Techniques involving closure by Z-plasty, rhomboid or myocutaneous advancement flaps require long operative time and hospital stay and are fraught with complications like loss of the graft or flap.³ Another technique used is marsupialisation, in which

partial closure of the wound is achieved by approximation of the skin edges after radical excision.⁴

Lord and Miller described a 'closed' technique that included the removal of the midline sinuses and lateral tracts.⁵ It is simple to perform and the complication and recurrence rates are within the acceptable limits. It is found that almost analogous results were achieved when the procedure was carried out using a radiofrequency device. We present this paper describing a new found technique of sinus excision using radiofrequency waves. The description is followed by a comparative analysis with the excision and marsupialisation technique.

Patient and Methods

This study was carried out at Gupta Nursing Home, Nagpur, India between January 2001, the follow up of which was continued till December 2002. A total of 28 patients with limited, chronic pilonidal disease were randomised into two groups. Randomisation was carried out by using closed envelope allocation at the time of patient's admittance in the hospital. Patients having acute disease, those who had been

previously operated for this pathology and those having more than 4 sinuses were excluded from the study. There were 16 males and 12 females within the age group of 16 and 32.

Patients were divided into two groups namely Group A and Group B. Group A patients were operated by the excision on marsupialisation technique in the same manner as is described by Meban et al. and Duchateau et al.^{6,7} The dissection was carried out with scalpel and haemostasis was achieved by using electrocautery.

Patients of Group B were operated by sinus excision technique in which the sinus tract was laid open with the help of radiofrequency device.

Patients from Group A were operated under spinal anaesthesia while patients from Group B were operated under local anaesthesia. The same surgeon performed all the operations. The study was approved by the local ethical committee and was performed according to the declaration of Helsinki. An informed consent was obtained from all the patients.

Radiofrequency surgery

Radiofrequency surgery is a method of achieving simultaneous cutting and coagulation of the tissues.⁸ For our procedure, we used the radiosurgical equipment known as Ellman dual frequency 4MHz [Ellman international, Hewlett, N. Y, USA]. This instrument produces an electromagnetic wave of a very high frequency of 4 megahertz. The unit is supplied with a handle to which different interchangeable electrodes could be attached to suit the requirement.⁹ A ball electrode for coagulation, a round loop electrode for shaving off the desired tissue and a fine needle electrode to open up the sinus tracts were used in this procedure.

Radiofrequency sinus excision procedure

The procedure was done with the patient lying in left lateral position. The sinus openings were identified and marked with an indelible pen after preparing the operating area with povidone iodine. The subcutaneous tissue was anaesthetised with 5 – 12 ml of 2% Xylocain solution. Methylene blue mixed with hydrogen peroxide¹⁰ was instilled through a syringe directly into one of the sinuses. This helped in opening up the tracts and gave a clear guideline about the tract and its branches. A probe was inserted in the sinus opening and with the help of the fine needle electrode the skin and subcutaneous tissue were incised leaving an area of at least 1 cm around the sinus opening. The brisk bleeding encountered was coagulated with the ball electrode. A funnel shaped dissection continued till the inner end of the sinus tract was reached. No attempt was made to deepen the incision to the post-sacral fascia. The pathological tissues and tracts were easily recognisable as tough and blued tissues. If the sinuses were found was shaved off with the round loop electrode leaving behind a red, raw area. No further attempt to brush or curette the remaining tissue was needed. To end with, the wound was covered with an adhesive dressing after applying an antiseptic ointment. This reduced the discomfort of the pack.

The patients from radiofrequency group were discharged on the same evening of the procedure, while the patients in marsupialisation group were discharged on the next day of operation.

Postoperative care

Regular cleaning of the wound twice a day with soap and the application of an antiseptic was found sufficient to take care of the wound. A tablet of Diclofenac sodium 50mg with serratiopeptidase 10mg twice daily was prescribed for the first 5 days and thereafter as and when the patient felt

pain. No antibiotic was prescribed. The patients from both the groups were called every week till their wounds healed completely to monitor the healing process of the wound and complications like infection, delayed wound healing, premature approximation of the edges etc. An independent qualified observer, unaware of the type of procedure carried out, performed the monitoring. Thereafter, they were asked to report after 12 months of the procedure.

Treatment evaluation

Both the groups were evaluated in terms of demographics, symptoms prior to the procedure, operation time, postoperative complications, healing period and recurrence rate.

Statistical analysis

All analysis was performed with all patients remaining in their initial allocated group for this analysis. Data were entered in to a database and analysed using statistical software (Graph pad Software, San Diego, CA). The student's unpaired t-test was used to determine the significance of contingency tables. A p value of <0.05 was considered significant.

Results

A total of 28 patients with limited, chronic pilonidal disease were randomly assigned to receive excision and marsupialisation technique (Group A) or sinus excision technique by radiofrequency (Group B). The patient demographics and symptoms prior to procedure were similar in both the groups. Intermittent discharge and pain were the most common symptoms (Table 1).

The time taken for completing the procedure was significantly shorter in radiofrequency group than marsupialisation group. Group A patients required a longer hospitalisation period as compared to Group B patients. None of the patients from the two groups encountered any immediate postoperative complication.

The period of postoperative pain in patients from Group A was significantly longer than their counterparts in Group B. Consequently, the patients from Group A needed almost double the doses of analgesics in comparison to the patients in Group B operated by radiofrequency technique (21 versus 13 doses).

Patients from Group B resumed their routine activities significantly earlier than the patients from Group A (5 days versus 16 days).

Two patients from the marsupialisation group developed wound infection in the form of suppuration in the suture line between the 10th and 14th day. The wounds were cleaned and antibiotics given for 10 days. An uneventful wound healing was accomplished thereafter. Similar wound infection was missing in Group B.

The follow-up period was similar in both groups. The wounds of patients in Group A healed earlier than Group B, but the difference was not significant. One patient from each group developed 'recurrence' (Table 2). At 12 months of follow up, no new sinuses were seen in either group.

Table 1: Patient demographic and pre-treatment symptoms

| | Excision and marsupialisation (n=14) | Radiofrequency sinus excision (n=14) |
|---------------|---|---|
| Age (years)* | 22 (6.4) | 24 (7.6) |
| Males: Female | 7:7 | 9:5 |
| Discharge | 12 | 13 |
| Pain | 10 | 9 |
| Pruritus | 9 | 7 |
| Bleeding | 1 | 2 |

* Values are mean (SD)

Table 2: Outcome

| | Excision and marsupialisation Group A (n = 14) | Radiofrequency sinus excision Group B (n = 14) | <i>P</i> |
|------------------------------|---|---|----------|
| Operation time (minute) | 34 (4.2) | 13 (3.40) | <0.05* |
| Hospitalisation (hours) | 30 (3) | 9(2) | |
| Period off work (days) | 16(3.5) | 5(1.50) | |
| Doses of analgesics required | 21(2.6) | 13(1.20) | |
| Wound infection (n) | 2 | 0 | NS |
| Follow up (months) | 13(0.9) | 13(0.1) | NS |
| Healing Period (days) | 13(0.9) | 13(0.1) | NS |
| Follow up (months) | 13(0.9) | 13(0.1) | NS |
| Healing period (days) | 40(3) | 42(4) | NS |
| Recurrence (n) | 1 | 1 | NS |

Values are means (SD), NS – not significant, *P<0.05 (unpaired Student's t-test)

Discussion

The history of surgical therapy of pilonidal disease now dates back to more than a century. But the management thereof still remains debatable even after introduction of many new methods, as also the appreciable modifications in the conventional ones. The surgeons, however, have reached a consensus that an ideal therapy for treatment of pilonidal disease should be simple, should inflict minimal pain and needing only a short hospital stay.¹¹ It should allow early return to work; requiring minimal wound care and should have low recurrence rate.

It has been reported that simpler treatment methods of pilonidal disease not only carry less morbidity, but also are associated with lower recurrence rate.^{12, 13, 14} Our sinus excision technique by radiofrequency aims to remove only the sinuses and the unhealthy tissues and thereby causing minimum damage to the surrounding healthy tissues. The radiofrequency device allows cutting and coagulation of tissues in an atraumatic manner, contrary to the electric bistoury. The advantages of radiofrequency over electrocautery and laser energy surgery reside in its precision in ablating tissues and in its control of operation. With radiofrequency, the targets tissue temperatures stay localised within a 60-90°C range thus limiting heat dissipation and damage to adjacent tissue. Electrocautery, diathermy, and laser temperatures are significantly higher (750-

900°C) which result in significant heat propagation in excess of the desired therapeutic need. These differences allow for radiofrequency being more accurate, minimally invasive and less morbid without compromising treatment efficacy and durability.⁸

Even marsupialisation technique using conventional scalpel, apparently works in an atraumatic way, but the prominent bleeding from the wound forces the surgeon to coagulate the bleeders with traditional electrocautery or diathermy much more frequently than radiofrequency. This results in more heat damage of the tissues and consequently causes more oedema and postoperative pain.

Time taken for the procedure

The operation period in the radiofrequency sinus excision technique was significantly shorter as compared to the marsupialisation technique. This is possible because while cutting, the electrodes provide a coagulation effect too, which diminishes chances of bleeding and consequently allow a clear operative site.¹⁵ As there is no need to suture the edges like in marsupialisation, the time spent in this manoeuvre stands reduced.

Need of suture material

During a marsupialisation, suture material is needed to approximate the edges of the wound. Sinus excision with radiofrequency dose not need any suture material. This helps in minimising the potential

complication of sepsis or wound dehiscence observed with suturing of the wound.¹⁶ Maintaining the shape of wound similar to that of an inverted cone prevented premature closure of the external skin wound.

Postoperative pain

The cause of pain after any surgical procedure is due either to exposure of the sensory nerve endings, or by an inflammatory response to the surgery in the form of local oedema due to lymphatic permeability. Radiofrequency surgery has been found successfully sealing the sensory nerve endings and the leaking lymphatics.¹⁷ With the reduced intensity and duration of pain, the patients in Group B needed fewer doses of analgesics than their counterparts in Group A. The marsupialisation procedure requires approximation of wound edges leading to tension and subsequent pain and discomfort.¹⁸

Hospital stay

All of the patients operated with radiofrequency procedure were discharged within 12 hours of the procedure. The patients were found comfortable with the bodily movements like sitting, walking and attending the nature's call. In comparison, the average duration of stay in the hospital was more in case of patients who were operated by marsupialisation.^{19,20} The patients operated by radiofrequency technique were able to join their duties much earlier than the patients operated by marsupialisation method. This was possible because of the reduced pain, and minimal discomfort in body movements.²¹

Shafik has described use of electrocauterisation in the treatment of pilonidal sinus.²² While the radio waves has a property to seal small blood vessels without creating any char, the cautery or diathermy instruments create heat at the tip of the instruments to seal the affected portion with the help of transferred heat. This technique of sealing invariably results in damage to the adjacent healthy tissues²³ further causing more pain and a delayed wound healing.

Nd-YAG²⁴ and Ruby lasers²⁵ have been used in treating pilonidal disease and are reported to reduce pain, length of hospitalisation and early return to work similar to the procedure conducted by us with the radiofrequency device. The radiofrequency instrument has almost all the advantages of laser without the attending disadvantages like the risk of misdirected reflected beams, the prolonged healing period involved and the high cost of treatment.²⁶

The cost of radiofrequency procedure is limited to the acquisition of the radiofrequency generator (approximately US \$ 1800 for the basic unit), which does not require recurring maintenance, except the normal care during its handling and use. The running cost of the instrument is negligible.

It is admitted that the wound-healing period in the incision and lay open technique was longer compared to other techniques using partial or complete primary closure. But considering the complexity of these extensive procedures, period of hospital stay, consumption of inpatient hospital resources, need of antibiotics and the need to repeat procedure in case of

wound dehiscence or complication,²⁷ the advantages of the procedure developed by us far outweighs the other procedures and particularly so in a developing country like India which is struggling to provide good health care to its masses.

Another advantage of radio surgery is that malleable electrodes are available that could be selected to suit the exacting requirements of any surgical position. This is especially found of great help when working on a cavity of the pilonidal sinus with presence of offending tissues.⁹

A follow up of 1 year was found sufficient for the study as most 'recurrence' occur within the first 6 months of the procedure. The recurrences denote failure of treatment rather than true recurrence. 'Recurrence' occurring a year or more after surgery is usually due to formation of new sinuses²⁸ and should be dealt accordingly.

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