



Research Article

VIDEO ASSISTED LASER ABLATION OF PILONIDAL SINUS VALAPS -A COMBINED MINIMAL INVASIVE APPROACH FOR MANAGEMENT OF PILONIDAL SINUS

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ABSTRACT

Aim: Pilonidal sinus is a common infective process occurring in the natal cleft and sacrococcygeal region. Treatment options range from non-operative modalities, simple incisions and primary closure to wide excision with extensive reconstructive procedures. The aim of our study was to develop a technique that can be carried out in an ambulatory setting with minimal morbidity.

Method: Patients with pilonidal sinus were taken up for Video Assisted Laser Ablation. All patients were operated under spinal anaesthesia in prone position. Corona Radial fibre 360 degree was used with a diode laser of wavelength 1470 nm from NeoV. The procedures were done under vision using a Videoscope. Laser fibre was introduced through the working channel of the scope. The thermal energy was delivered to ablate sinus tract epithelium and granulation tissue with subsequent healing by secondary intention.

Result: A total of 21 patients were treated with video assisted laser ablation (VALAPS) from March 2017 to March 2019. Out of these, 20 patients took part in the follow up for six months. We lost the follow up in one patient. Out of 21 patients, two patients had presented with recurrence after rhomboid flap and 3 patients had presented with pilonidal abscess. In patients with pilonidal abscess, cavity was drained, antibiotic cover was given for 5 days and laser ablation was carried out. The initial success rate was 90.5% as two patients had recurrence. In both these patients, the procedure was repeated with complete cure and hence overall success rate of 95.3% has been reported.

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INTRODUCTION

Pilonidal sinus (PS) is a dent in the skin that looks like a hole. It usually occurs above the cleft of the buttocks i.e. the portion of the skin under which the tail bone exist. During World War II more than 80000 American soldiers were hospitalized with this condition. People thought the disease was because of irritation from riding in a bumpy jeep. This led it to be being known as "Jeep rider's Disease".¹

Clinically pilonidal sinus disease (PD) can be asymptomatic or it may manifest as a recurrent symptomatic abscess. It may also present as chronically inflamed cavity with local fluid discharge and variable discomfort.^{2,3} Sacrococcygeal PD occurs predominately in young men at a ratio of 3:1 over women.^{4,5} The estimated incidence is 26 cases per 100,000 people.⁵ Some of the factors associated with the development of PD are obesity, increased sweating, poor hygiene, co-existing hidradenitis suppurativa, prolonged sitting⁵.

This disease has a considerable impact on the quality of life, as it hinders daily activities. The treatment depends on the complexity of the pilonidal sinus. There were reports describing the instillation of liquid or crystalline solutions into the pits.^{5,7} Average healing period was 40 days with success rate of 59 to 95%. Fibrin glue was also used as an adjunct in the treatment of chronic or recurrent sinuses^{8,9}. The midline follicle excision with lateral drainage was popularized by Bascom¹⁰. Similar technique was originally described by Lord and Millar in 1965.^{11,12,13}. Nava cues at al¹⁴ reported a wide range of recurrence rates varying from 0 to 40% for different surgical approaches, concluding that in the treatment of PS "less is more". Over the past decade, minimally invasive techniques for treatment of PS have been suggested. Recent endoscopic treatment was proposed by Meinero et al¹⁵. This minimally invasive approach has been named Endoscopic pilonidal sinus treatment (EPSiT).

In our study, we report our experience with Video Assisted Laser Ablation of Pilonidal Sinus (VALAPS). This technique presents better healing rate with minimum morbidity. The objective behind using Video scope was to do the procedure under vision.

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MATERIALS AND METHODS

A total of 21 patients from March 2017-March 2019 with symptomatic, chronic or recurrent pilonidal sinus were enrolled in the study. All patients underwent surgery under spinal anaesthesia in prone position. Informed consent was obtained from all patients before the procedure. Patients' data including gender, age, recurrence, healing period and vas pain score at 24 hours were evaluated.

Surgical technique

Laser ablation was performed under vision using a Videoscope. Pre operatively the patients were advised to shave an area of 6 cms. in diameter around the sinus opening. All patients were operated under spinal anaesthesia in prone position, with both the buttocks pulled apart with adhesive plaster. A metal probe was inserted in the sinus tract to know the length of the tract. Tip of the metal probe was brought out laterally about 2 cms. from midline thus converting the tract into a tunnel for better irrigation. (Fig.1 a & b). Incision was made laterally as most of the times the recurrence is from the midline. Videoscope (Fig 2) was inserted through the primary opening to have a good vision of the necrotic material and hair present in the tract. Once the findings were confirmed, the scope was removed and thorough curetting of the tract was done using a sharp curette. Endoscopic use of brush was avoided as in our opinion sharp curetting leads to better removal of necrotic material and hair. (Fig 3 and 4). Necrotic material was sent for histopathology examination.

After removal of necrotic material and hair, entire tract was irrigated with normal saline. Endoscope was reinserted to check that the tract was thoroughly cleaned and no more hair or necrotic material were present (Fig.5) Corona 360 degree radial laser fibre 600 μ m with distal and outer diameter of 1800 μ m was inserted through iatrogenic opening into the sinus tract up to the primary PS opening. The equipment used was diode laser 1470nm from Neo V. After insertion, the fibre was activated and the whole tract was ablated using energy of 10W per mm per sec. (Fig. 6 a,b, and 7). Gradually the fibre was withdrawn up to the iatrogenic opening. In between the procedure, the fibre was taken out to clean the tip and remove the adherent necrotic material to deliver optimum laser energy. In the tracts with large cavities, fan shaped pattern was followed to avoid any untreated areas (Fig.8). The use of electro cautery was avoided as the cautery works in a unidirectional manner and hence tracts with larger diameter could not have been properly ablated. On the contrary, corona radial fibre emits energy in all the directions and hence is more effective.(Fig 9). Finally the primary opening was slightly widened. Irrigation of the tract was done before discharging the patient to remove remnants of any burnt granulation tissue present in the tract. Dressing of the wound was done using Nano silver gel preparation. The attendants were explained to do the dressings of the wound at home and all the patients were called for follow up after two weeks.



Fig 1 (a)



Fig 1 (b)

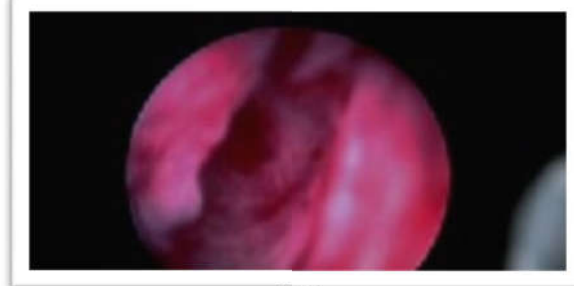


Fig 2



Fig 3



Fig 4



Fig 5



Fig 6



Fig 6 (b)

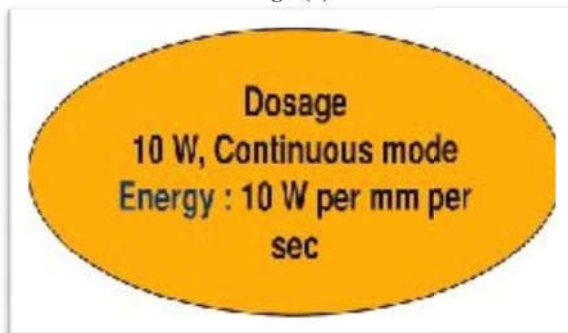


Fig 7

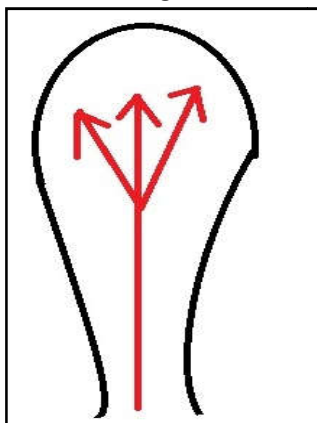


Fig 8



Fig 9

The specimen sent for histopathology revealed dense inflammatory infiltrate comprising lymphomononuclear cells. Foreign body giant cells were present in few. This was suggestive of nonspecific chronic inflammatory pathology. Thus pilonidal sinus is a chronic inflammatory process of the skin caused by keratin plugs, debris and hair, clinically observed as pits having penetrated the dermis.

Follow up: All the patients were encouraged to mobilize themselves few hours after the surgery. Instructions were given to the patients to irrigate the cavity through the external opening with saline and keep the area clean and dry. Instructions were also given to keep the surrounding area shaved. All the patients were assessed for VAS score three hours postoperatively which was recorded from 3 to 0 on the first postoperative day (graph 3)

DISCUSSION

Pilonidal sinus is often present in obese & hirsute patients who have a sedentary lifestyle and experience profuse sweating. Although etiology of pilonidal sinus is not yet clear, Bascom's histologic studies demonstrated a sequence of stages in the development of this condition. He described that folliculitis leads to small sub-dermal abscesses which increase in size to form a large abscess cavity. The hair is drawn into pilonidal cavity through the suction effect of the gluteal movement⁹. Presence of large amount of hair in the lower back is one of the risk factors that increase the chances of PS development. Many surgical procedures have been proposed for the treatment of pilonidal sinus. Some surgeons consider wide excision as procedure of choice while others prefer primary closure or lay open technique. During early period when widespread acceptance of congenital theory prevailed, procedures were described that completely removed all tissue down to the sacral fascia¹⁵. Wide excisions were carried out. These procedures produced wounds which were described as shark bites.

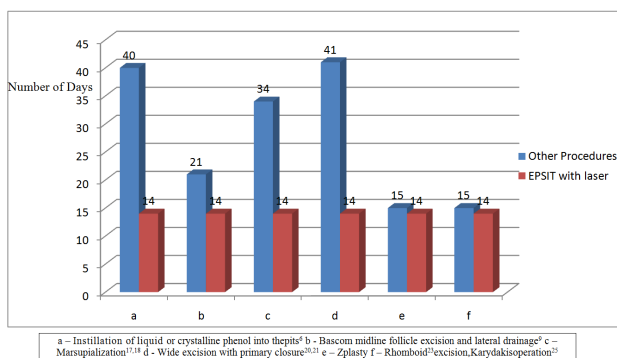
The traditional methods described by Bascom⁶ reported a recurrence rate of 15% with minimal disability and healing within 3 weeks. The lowest recurrence rate of 1% has been described by Karydakis himself²⁵. Complaints of significant post-operative pain, complications like infection and seroma formation are associated with Karydakis procedure. Many surgeons favour an approach of incision and marsupialization. Recurrence rate with this procedure range from 1% to 19% with average healing time of 34 days^{17,18} (Table 1). Procedures like Z plasty, rhomboid flap cause more pain, discomfort with longer healing period and great inconvenience to the patient. (graphs 1, 2). Meinero *et al*¹⁵ made a commendable

contribution by developing a fistuloscope with a possibility of destroying the sinus cavity under direct vision through an operative channel. A method which is effective & less complicated is still sought by surgeons. Video assisted laser ablation of pilonidal sinus (VALAPS) may be the solution as a minimal invasive procedure to decrease the morbidity and chances of recurrence.

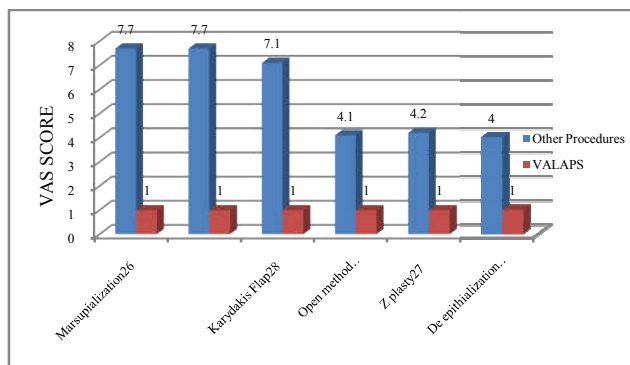
In our experience, complete removal of necrotic debris, hair and laser ablation of tract can be carried out under vision as a minimally invasive procedure. This approach reduces the risk of unnecessary damage to surrounding tissue and thereby reducing associated post-operative inflammation. The rationale behind using Videoscope is that it allows the procedure to be carried out under vision. The technique is beneficial as laser destroys the complete sinus tract by ablation. Small wound created by this technique heals faster and has an optimal aesthetic appearance. The success rate of the procedure is 95.3 % with lesser hospital stay, minimum pain and reduction in the interruption of daily activities. More over in case of recurrence the procedure may easily be repeated. The results demonstrate that the new technique offers less morbidity and is more effective than the conventional techniques. (graphs 1 and 2). We believe that VALAPS is simple, safe, effective, having minimum recurrence rate and must be preferred over other techniques.

Table 1 Comparison of surgical techniques in reference to recurrence periods

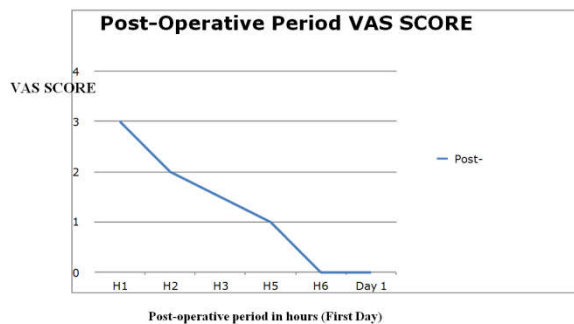
Procedure	Recurrence Rate
Instillation of liquid or crystalline phenol into thepits ⁶	60% - 95% ⁶
Bascom midline follicle excision and lateral drainage ⁹	15%
Marsupialization	up to 19%
Wide excision with primary closure	up to 20% ^{19,20,21}
Zplasty ²² Rhomboid ²³ excision	up to
Karydakisoperation ²⁵	11% ^{22,23,24}
EPSIT	7.7%
VALAPS	4.7%



Graph 1 Comparison of Surgical Technique in reference to healing period.



Graph 2 VAS Score Comparison



Laser Ablation Vas Score Graph 3

RESULTS

Total number of 21 patients were treated with VALAPS. Out of these, 2 patients had recurrence and were again subjected to laser giving a success rate of 95.3%.

MALE: FEMALE 20:1 (95.2%: 4.76%). AGE 19 TO 60 YEARS

Characteristics	Value
Total No of Patients	21
Primary 19 and 2 with recurrence after Rhomboid flap	21
Recurrence after VALAPS procedure	02
Male : Female	20 : 1
Age	19 – 60 years
Infection	None

CONCLUSION

Video assisted laser ablation of pilonidal sinus is a minimally invasive procedure. It is easy to perform, offers less post-operative care, has shorter hospital stay, almost painless with enhanced recovery and minimal scar formation. The procedure is easy to perform with a short healing curve and effective results. This technique could be adopted as treatment for patients with pilonidal sinus.

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