

## Modified Hybrid Approach for the Management of Pilonidal Sinus Disease: Combination of Laser Sinus Tract Ablation with Multiple Ksharasutra Application(CLAKS Technique)

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### ABSTRACT

**Pilonidal sinus disease (PSD)** is a chronic and recurrent condition predominantly affecting patient. Conventional surgical techniques are associated with high recurrence rates, prolonged healing time, and postoperative discomfort. Minimally invasive approaches such as laser sinus ablation offer less pain and faster recovery but remain limited by recurrence risk. Ksharasutra therapy, a traditional Ayurvedic para-surgical procedure, provides effective tract excision and healing but requires prolonged weekly sittings, especially in long sinus tracts. We propose a new idea of **Hybrid surgical technique(CLAKS Technique)** combining **laser ablation** for primary sinus tract destruction with **multiple Ksharasutra placement** in segmented tracts. By dividing long tracts into smaller segments and applying multiple threads resulting in reduced healing time, faster cutting of tract and minimised recurrence risk with minimal post operative complications. This case report details the management of pilonidal sinus of a 25 year old male patient using the hybrid surgical technique, a minimally invasive advanced approach. Imaging studies confirmed the presence of fluid filled sinus tracts with abscess formation. This case highlights the effectiveness of Hybrid technique in treating complex pilonidal disease and underscores its potential as a preferred treatment modality in similar cases.

**Keywords:** Pilonidal sinus, Laser ablation, Ksharasutra, Hybrid surgery, Minima Recurrence prevention| Feature

### 1. INTRODUCTION

Pilonidal sinus disease is prevalent in various population predominantly affecting young adult male aged from 18 to 30 years causing pain, pus discharge, and swelling. The disease typically arises from hair follicles becoming obstructed and inflamed leading to the formation of one or more sinus tracts in natal cleft. Understanding these underlying causes is crucial for effective management and prevention of recurrence.

Conventional excision surgery is painful, requires prolonged wound care, and has a high recurrence rate with post operative complications. Minimally invasive options like **laser ablation** provide less morbidity but may relapse. **Ksharasutra therapy** ensures tract eradication and preserves healthy tissue and less scarring and reduces recurrence but is time-consuming in long tracts. It requires repeated visits for ksharasutra changing and may cause discomfort during thread tightening.

This paper presents a **hybrid method(CLAKS Technique)** laser tract ablation combined with **multi-level Ksharasutra application** to balance minimal pain with durable results and minimal post operative complications and to get better promising results.

### 2. CASE REPORT

#### Patient Profile :

A 25 year old patient presented with complaints of pain , pus discharge , swelling in the gluteal region since 1 year with cutaneous sinus openings located in paracentral aspect of natal cleft. The symptoms persisted since 1 year and were associated with recurrent infections that caused significant discomfort and impacted his daily activities.

#### Characteristics -

The sinus tract is fluid filled with measuring 10 to 12 cm in length and 22 mm in depth and width

#### Management and Surgical steps :

The management of the patient with multiple pilonidal sinuses involved a comprehensive approach utilizing the Hybrid surgical technique.

Pre-operative preparation :

- Part preparation and shaving done.
- Sinus tracts evaluated and identified clinically.

Diagnostic Tool -

- An MRI Fistulogram was performed revealing fluid filled sinus.



**Fig 1: Sinus openings located in paracentral aspect of the natal cleft using probe and to evaluate the length of tract**

Surgical procedure :

*Identification and Probing* - The procedure began with a thorough examination under spinal anaesthesia to identify the sinus tract. The fistula probe is passed through the external opening of the sinus and is used to delineate and identify tract accurately.

*Laser Ablation* -

The long tract was broken down into smaller tracts of 2 cm and then Laser energy of 1470nm at 10 watts was delivered homogeneously along the length of the tract causing thermal shrinkage and to obliterate the squamous epithelium lining effectively.

*Ksharsutra Application* -

The medicated ksharsutra thread is moderately tied to the eye of probe inside the tract and keeping both ends outside looping the sinus tract

Post operative Care :

The tract is left open for drainage that prevents pus collection and dressing done with antiseptic ointment. The patient was monitored for any compl



Fig 2 : Laser ablation done on the tract after probing



Fig 3 : Multiple Ksharsutra application on the sinus tract



Fig 4 : First Follow up after 7 Days of Surgery



Fig 5 : Second Follow up after 14 Days of Surgery



Fig 6 : Third Follow up after after 21 days of Surgery and healthy granulation tissue seen



Fig 7 : The wound is almost healed after 28 Days of Surgery and a normal scar is seen

ications and was discharged on the same day. Follow up assessments were being set to check the progress of wound healing well without complications.

### 3. MODE OF ACTION

#### *Laser Ablation*

Laser ablation works by thermal effect of laser energy delivered directly into the sinus tract.

- *Energy Delivery* - The radial fibre laser probe emits radial energy circumferentially along the tract walls.
- *Thermal Coagulation* - The laser energy causes photo-thermal destruction of epithelial lining of sinus tract.
- *Sinus Tract Obliteration* - The lining replaced by scar tissue leads to obliteration of sinus cavity preventing recurrence.

#### *Ksharsutra Application*

Acts through 3 main properties :

- *Mechanical / Cutting Action* - The thread itself works like a seton. When tied through the sinus tract it maintains constant pressure on the walls of the tract and gradually cuts through the tract at controlled rate.
- *Chemical / Cauterizing Action* - The medicines coated on the thread provide chemical action causing lysis and debridement of unhealthy tissue , preventing pus accumulation and dissolving debris and infected granulation tissue inside the sinus.
- *Antimicrobial / Healing Action* - *Haridra(turmeric)* being natural antiseptic and antibacterial reduces infection and promotes formation of healthy granulation tissue accelerating wound healing.

### 4. RESULTS (FOLLOW-UP OBSERVATION)

The patient reported significant improvement in symptoms and expressed high satisfaction with the procedure. This combined management and surgical approach emphasises the effectiveness of using Hybrid Technique in treating pilonidal sinus disease with minimal pain and discomfort with reduced risk of recurrence and minimised recovery time.

### 5. DISCUSSION

Pilonidal sinus disease is a condition that poses significant challenges in management particularly due to its recurrent nature and discomfort. The multifactorial etiology of PSD primarily involves hair becoming embedded in the gluteal fold provoking a foreign body reaction that leads to inflammation and the subsequent formation of sinus tract. This case report highlights the successful application of the Hybrid surgical technique in treating the disease.

The Hybrid technique(CLAKS Technique) offers several advantages that are particularly relevant to the patients affected by PSD. Notably, patients undergoing Hybrid technique report reduced post-operative complications and a quicker return to normal activities. Hybrid technique combines **fast healing of laser ablation and low recurrence with Ksharasutra application**. Segmenting the tract and applying multiple ksharsutra thread reduces procedure time and enhances healing efficiency.

This case contributes to the growing body of evidence supporting minimally invasive techniques in pilonidal sinus management highlighting their role in improving patient outcomes and satisfaction. Future research should focus on larger cohorts to validate these findings and explore long term efficacy of Hybrid surgical technique in diverse population. This method offers a balanced, patient-friendly alternative in pilonidal sinus management.

### 6. CONCLUSION

This study contributes valuable insights into managing pilonidal sinuses using Hybrid surgical technique. It highlights the effectiveness of this minimal invasive approach in achieving higher successful outcomes with minimal complications.

The hybrid technique of **laser sinus ablation with multiple Ksharasutra application(CLAKS Technique)** is a promising approach in pilonidal sinus surgery. It reduces pain, minimises healing time, and minimises recurrence compared to conventional methods. Larger clinical trials are required to validate long-term outcomes.

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