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Article

A Prospective Study of Outcome of GIPS Procedure as Minimal Invasive Surgical Approach for Pilonidal Sinus

Article History:

Name of Authors & *Affiliation*
Dr Yogesh Ahuja,[1] Dr Bhanwar lal Yadav,[2] Dr Ashish Garg,[3] Dr. Anuj kedawat,[4] Dr Nitish Kumar[5]

[1,3-5]Resident, Department of General Surgery, SMS Medical College and Hospital, Jaipur, India
[2]Senior Professor, Department of General Surgery, SMS Medical College and Hospital, Jaipur, India

Corresponding Author:
Dr Yogesh Ahuja, Resident, Department of General Surgery, SMS Medical College and Hospital, Jaipur, India. Email : yogeshahuja25@gmail.com

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Abstract: **Background**: Pilonidal sinus disease (PSD) is a chronic inflammatory condition predominantly affecting young adult males. Traditional surgical methods often result in high morbidity and recurrence. Minimally invasive techniques like GIPS procedure aim to improve outcomes with reduced complications and faster recovery. Aim: To evaluate the efficacy of the GIPS procedure in managing pilonidal sinus disease in terms of recurrence, postoperative pain, wound healing, and complications. **Methods**: This prospective observational study was conducted at SMS Medical College, Jaipur, from Sept 2023 to Dec 2024. Fifty patients diagnosed with PSD underwent the GIPS procedure. Data on demographics, clinical features, operative findings, postoperative pain (VAS), wound healing, complications, recurrence, return to daily activities, and patient satisfaction were collected over a 6-month follow-up. Results: The mean age was 24.6 ± 4.3 years, with 84% male patients. Most (56%) had sedentary occupations. Pain and discharge were the predominant symptoms. By 6 weeks, 88% achieved complete healing, reaching 100% by 3 months. Pain scores significantly decreased from 5.8 at week 1 to 0 at 6 months ($p < 0.001$). Minor complications were limited (8% infection, 4% serous discharge). Recurrence was observed in only one case (2%) at 6 months. Most patients (80%) resumed normal activities within 2 weeks, and 88% reported excellent satisfaction. **Conclusion**: The GIPS procedure is a safe, effective, and minimally invasive approach for PSD, offering low recurrence, rapid healing, minimal pain, and high patient satisfaction. It is a promising alternative to conventional surgical techniques.

Keywords GIPS, Minimal Invasive Surgerey, Pilonidal Sinus.

INTRODUCTION

Pilonidal disease is a chronic skin condition commonly affecting the natal cleft near the sacrococcygeal region. While historically considered congenital, it is now widely regarded as an acquired condition due to hair penetration, friction, and local trauma. The term “pilonidal” derives from Latin, meaning “nest of hairs,” reflecting its hallmark feature: hair accumulation in sinus tracts [1].

This disease primarily affects young adult males, with a male-to-female ratio of 3–4:1, and is most prevalent in individuals aged 15–25 years. Risk factors include a sedentary lifestyle, obesity, a deep natal cleft, poor hygiene, and occupational exposures such as prolonged sitting [2]. The disease can present acutely with abscesses or chronically with sinus tracts, pain, discharge, and recurrent infections, significantly impacting quality of life [2,3].

Management strategies vary based on disease severity and presentation. Simple incision and drainage provides temporary relief in acute cases but often result in recurrence [3]. Definitive treatment aims to remove all sinus tracts and prevent recurrence. Traditional surgical approaches like wide excision with secondary healing or primary closure have high morbidity and prolonged recovery. These methods, particularly midline closures, are also associated with higher recurrence and infection rates [3,4].

Given the burden of pilonidal disease in young, active individuals, especially those with occupational limitations, there's a growing interest in minimally invasive procedures like GIPS. This study aims to evaluate the outcomes of the GIPS procedure [5] in terms of recurrence, pain, morbidity, and healing rate to assess its viability as a preferred surgical treatment.

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MATERIALS AND METHODS

This study was designed as a hospital-based, prospective observational interventional study. It was conducted in the Department of General Surgery at SMS Medical College and Hospital, Jaipur, Rajasthan, carried out over a period of 16 months, from Sept 2023 to Dec 2024. The study population included patients diagnosed with pilonidal sinus who met the eligibility criteria and treated at SMS Medical College and Hospital. A total of 50 patients were enrolled after considering a 10% potential dropout rate from the calculated sample size of 46. Patients younger than 15 years, with medical contraindications to surgery, and those undergoing pilonidal sinus surgery by techniques other than the GIPS procedure were excluded. Data were collected using a pre-tested and structured proforma that included sociodemographic details (e.g., age, gender, occupation), clinical history, presenting complaints, and examination findings. Each participant underwent elective perianal surgery using the GIPS procedure, and postoperative outcomes were monitored over a 6-month follow-up period. Patients were followed up postoperatively at the end of week 1, week 2, week 6, 3 months, and 6 months. Outcomes assessed included wound healing status, recurrence, pain score (using the Visual Analog Scale), and postoperative complications. Data were compiled using Microsoft Excel and analyzed using appropriate statistical methods. Qualitative data were expressed as frequency and percentage. A p-value of <0.05 was considered statistically significant, while <0.001 was considered statistically highly significant. The study protocol received ethical approval from the Institutional Ethical Review Committee of SMS Medical College and Hospital, Jaipur. Informed consent was obtained from all participants after they were provided with detailed information about the study, its risks and benefits, and their rights to withdraw at any time.

RESULTS

A total of 50 patients diagnosed with pilonidal sinus were included in the study. The mean age of the study population was 24.6 ± 4.3 years, indicating a predominance of young adults. The majority were male (84%), with only 16% female representation. Regarding occupation, 56% of patients were engaged in sedentary work, 28% performed manual labor, and 16% were students, suggesting that prolonged sitting may contribute to disease development.

Table 1. Age distribution of patients.

Age Group (years)	Number of Patients	Percentage (%)
<30	35	70
30–44	10	20
45–59	4	8
≥60	1	2

Table 2. Sex distribution of patients.

Gender	Number of Patients	Percentage (%)
Male	42	84
Female	8	16

Table 3. Occupational Distribution

Occupation	Number of Patients	Percentage (%)
Sedentary	28	56%
Manual Labor	14	28%
Students	8	16%

Clinically, most patients (44%) reported symptoms lasting 1–3 months, followed by 36% with symptoms for more than three months and 20% with symptoms for less than one month. Pain was the most common symptom, experienced by 96% of patients, followed by discharge from the sinus in 80%, local swelling in 64%, and fever in 12%.

Table 4. Presenting Complaints

Symptom	Number of Patients	Percentage (%)
Pain	48	96%
Discharge	40	80%
Swelling	32	64%
Fever	6	12%

Intraoperative findings revealed that 92% of sinus tracts were located in the midline sacrococcygeal region, while 8% were paramedian. The number of sinus openings varied, with 56% of patients having 2–3 pits, 24% presenting with a single pit, and 20% having four or more. Most sinus tracts (76%) had a depth of <2 cm, while 18% were between 2–4 cm, and 6% exceeded 4 cm in depth.

Postoperative pain, measured by the Visual Analog Scale (VAS), showed a significant and progressive decrease over time. At the end of the first week, the mean pain score was 5.8 ± 1.3, which reduced to 2.9 ± 1.1 by the third week. By six weeks, it further declined to 1.3 ± 0.7, reaching 0.3 ± 0.6 at three months and completely resolving by six months. This reduction was statistically significant ($p < 0.001$).

Table 5. VAS Pain Score Over Time

Follow-Up Time	Mean VAS Score	Standard Deviation
Week 1	5.8	±1.3
Week 3	2.9	±1.1
Week 6	1.3	±0.7
3 Months	0.3	±0.6
6 Months	0	—

Wound healing also progressed steadily. At three weeks post-surgery, 36% of patients had achieved complete healing. This increased to 88% by six weeks, and all patients (100%) had complete healing by three months, with statistical significance ($p < 0.001$).

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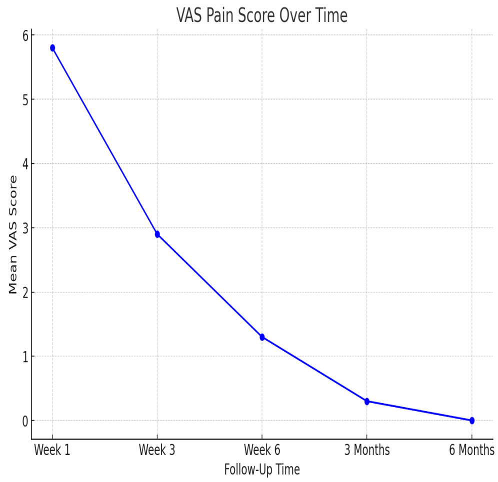
Table 6. Wound Healing Status

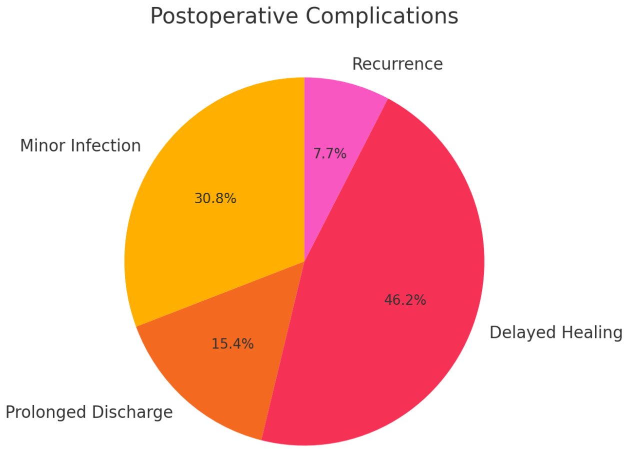
Follow-Up Time	Patients Healed	Percentage (%)
3 Weeks	18	36%
6 Weeks	44	88%
3 Months	50	100%

Minor postoperative complications were observed in a small number of cases. Minor infections occurred in 8% of patients, prolonged serous discharge in 4%, and delayed healing in 12%. indicating the overall safety of the GIPS procedure. Recurrence was minimal. No patients experienced recurrence at the three-month follow-up, and only one patient (2%) reported recurrence at six months. Although not statistically significant ($p = 0.197$ (not statistically significant)), this low recurrence rate suggests effective long-term outcomes.

Table 7. Postoperative Complications

Complication	Number of Patients	Percentage (%)
Minor Infection	4	8%
Prolonged Discharge	2	4%
Delayed Healing	6	12%
Recurrence	1	2%





Regarding postoperative recovery, 68% of patients resumed their daily activities within 1–2 weeks. 12% returned to normal activities within one week, while 68% resumed within 1–2 weeks, while 20% required more than two weeks. Finally, patient satisfaction was notably high. A majority of 88% rated their surgical outcome as excellent, 10% as good, and only 2% as fair, reflecting the favorable efficacy and acceptability of the GIPS procedure.

DISCUSSION

This study demonstrates that the GIPS procedure is a safe and effective minimally invasive option for treating pilonidal sinus disease, particularly in young adult males, who formed the majority of the study population. The high incidence among sedentary workers supports the association between prolonged sitting and disease development [2].

Postoperative recovery was notably rapid, with most patients experiencing substantial pain relief and early return to normal activities. Pain scores dropped significantly from week one to six months, and complete wound healing was achieved in all patients within three months, underlining the benefits of minimal tissue dissection in GIPS [5,6].

Complication rates were low and limited to minor infections, delayed healing, and serous discharge, with no major adverse outcomes. The recurrence rate of just 2% at six months emphasizes the durability of the procedure, even in patients with multiple pits or deeper tracts.

The findings support the integration of GIPS into routine practice, especially in resource-limited or peripheral centers due to its simplicity, reproducibility, and minimal need for advanced infrastructure [7]. Further studies with longer follow-up and comparative trials are warranted to validate these promising results.

This prospective study supports the role of the GIPS procedure as an effective minimally invasive technique for pilonidal sinus disease. The young male predominance and association with sedentary lifestyle match the global profile of this condition [2,5]. These demographic findings emphasize the need for interventions that enable faster recovery and minimal downtime, particularly in working individuals.

Pain reduction postoperatively was significant and progressive, dropping to zero by six months. The trend reflects both effective sinus tract removal and minimal tissue trauma associated with GIPS [5]. Complete wound healing in all patients by three months and early return to daily activity for the majority highlight the recovery benefits over traditional excision or flap methods [3,6]. Complications were infrequent and minor, with no major adverse events. The 2% recurrence rate is notably low

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and affirms the completeness and precision of tract removal under direct visualization [6]. Even in patients with multiple or deep tracts, GIPS yielded high success and satisfaction, supporting its versatility across disease severities [5,6,7].

Overall, the study supports GIPS as a patient-friendly option with low morbidity and high compliance. Its simplicity and short learning curve make it adaptable to peripheral settings as well. However, the absence of a control group and the short follow-up duration suggest a need for randomized trials and longer-term evaluations [6] to fully establish its comparative efficacy.

CONCLUSION

The findings of the study indicate that GIPS procedure provides a minimally invasive, low-morbidity option for treating pilonidal sinus disease. It offers advantages over traditional surgical techniques in terms of pain, healing time, complications, and return to activity. These results support the broader adoption of GIPS, particularly in cases without extensive tract formation. Further studies with longer follow-up are needed to confirm its long-term effectiveness.

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