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## Recurrence-free primary closure operative technique for pilonidal sinus

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### Abstract

Pilonidal sinus is prone to have recurrence after surgery. This study is aimed to reduce the chances of post-operative recurrence, hospital stay and postoperative healing time. Patients of pilonidal sinus were admitted in various hospitals of Gurgaon, Haryana between January 2001 to December 2018. Informed consent taken from every patient. No case of recurrence was reported. Twelve patients (7.14%) developed post-operative wound infection. One patient (0.59%) had gaping of wound after removal of sutures. Average hospital stay was one day. Patients were called on 3rd post operative day in OPD to change dressing, remove the drain and review the wound and again on 10th post operative day for removal of skin sutures and on 14th post operative day for removal of tension sutures. Our technique of recurrence-free primary closure for pilonidal sinus is easy, simple, recurrence free and with short learning curve.

**Keywords:** Healing, infection, natal-cleft, pilonidal sinus, post-operative complications, recurrence

### Introduction

Pilonidal Sinus is a chronic recurrent disorder of the sacrococcygeal region which commonly occurs in young adult patients. The incidence of pilonidal sinus is approximately 26 cases per 1,00,000 people. It is more common in young male adults than females. It is more common in men due to their hairy body. It is also called, "jeep drivers disease" as it was very commonly found in jeep drivers during world war II. In natal cleft.

Pilonidal sinus disease was described by Herbert Mayo for the first time in 1833 <sup>[1]</sup>. R.M. Hodges coined the term 'pilonidal' in 1980 <sup>[2]</sup>.

Surgical treatment is required for pilonidal sinus. There are two types of surgical procedures, open method and closed method. Recurrence after PNS Surgery is common that's why various operative procedures are developed to achieve low recurrence rate. General impression is that closed method has more recurrence than open method, but open method is troublesome, painful and inconvenient to the patient as daily dressing is done for weeks and sometimes months, therefore various closed methods are created such as V-Y flap, Z-Plasty, Limberg flap, and Karydakias flap techniques. Our technique is aimed to reduce the chances of post-operative recurrence, hospital stay and post-operative healing time.

### Materials and Methods

Patients of pilonidal sinus were admitted in various hospitals of Gurgaon, Haryana between January 2001 to December 2018. A total of 168 cases of pilonidal sinus were operated. This study did not include pilonidal cyst and acute abscess. The criteria for treatment was inclusion of chronic pilonidal sinus patients. The age of patients ranged between 15 years to 58 years. Every patient's personal details, such as age, sex, height, weight and body mass index and duration of complaints were recorded. Co-morbidities such as diabetes, hypertension, heart disease, obesity, thyroid problem and history of previous surgery were properly recorded. Our recurrence free primary closure operative technique is compared with flap technique of Karydakias.

In our study, patients were advised to apply epilation cream for 3 days before surgery or shaving of operation area was done on the operation tables just before operation. As a routine a pus or discharge swab was sent before the surgery and appropriate antibiotics were used per, peri and 3 days post operative period as almost all cases were having infection.

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### Recurrence-free operative technique

- General or spinal anesthesia was used.
- Patients were put in prone position. Adhesive tapes were applied on buttocks encircling the operation table to keep buttocks apart.
- 5 ml of undiluted methylene blue dye in a 10 ml syringe was taken and directly pressed against skin on sinus opening and then slowly pushed the dye.
- An encircling elliptical incision was made around the sinus opening and carried towards midline and the two parts of incision met in midline, after incision, the whole sinus tract was excised.
- All visible blue tissue was excised. Margins of the wound made clean and sharp with knife and not with scissors.
- Meticulous haemostasis was done by catching and cauterizing bleeders with small curved spencer wells artery forceps or with a pointed thumb tissue forceps. Proper haemostasis is also one of the fundamentals to avoid recurrence.
- The wound sides are undermined on both sides in full thickness of wound. This is done with the help of a knife for 1 to 1.5 cm depending upon the size of wound.
- A No. 10 or 12 radivac suction drain was introduced from one side of the incision.
- A 50:50 mixture of 10% povidone-iodine solution and hydrogen peroxide solution was used to wash the wound to reduce chances of post operative infection.
- Tension sutures were applied as deepest first layer of sutures with 1/0 prolene, 3 or 4 tension sutures were applied depending upon the size of the wound.
- The second layer of sutures was applied as interrupted buried mattress sutures with 2/0 vicryl to close dead space.
- Skin was closed with 4/0 prolene interrupted mattress sutures. The distance between skin sutures should not be more than 0.5 cm to avoid inversion or eversion of skin.
- 10% povidone-iodine soaked dressing gauze piece was placed over the suture line. Over it, few, dry dressing gauze pieces were kept and tension sutures tied over these gauze pieces in simple knots which can be opened at the time of dressing and again can be tied in same way. Over the tension sutures one gamzee was placed and adhesive tape was applied. Patients were instructed to avoid wetting of the dressing.
- Patients were allowed to sleep on their backs from the first day after operation.
- Patients were allowed to ambulate 6 hours after surgery and discharged next day with the drain.
- Most of the patients were given tab Diclofenac SR 100 mg SOS for pain.

Patients were called on 3rd post operative day in OPD to change the dressing, remove the drain and review the wound and again on 10th post operative day for removal of skin sutures and on 14th post operative day for removal of tension sutures. Patients were called to see on follow up 2 weekly for 1 month, then monthly for 3 month and then 6 monthly for 1 year and then were advised to telephone or report personally to my OPD once a year for 5 years.

### Results

The series had 168 cases which included 153 (91.07%) male and 15 (8.93%) female patients. Average age of our patients was 36.5 years. Average weight of patients was 78.5 kgs. (Table 1, 2

and 3).

**Table 1:** Gender wise distribution

Gender	Number	Percentage
Male	153	91.07%
Female	15	8.93%

(N=168)

**Table 2:** Age wise distribution

Age	Number	Percentage
Below 20	32	19.05%
20-30	95	56.54%
30-40	33	19.64%
Above 40	8	4.77%

(N=168)

**Table 3:** Weight wise distribution

BMI	Number of patients	Percentage
18.5-25 (Normal)	110	65.48%
25-30 (Over Weight)	46	27.38%
Above 30 (Obese)	12	7.14%

(N=168)

Patient with maximum weight was of 115 kg with 5'8" height. Patient with minimum weight was of 42 kgs with height of 5'0". Twelve patients (7.14%) developed post-operative wound infection. One patient (0.59%) had gaping of wound after removal of sutures, which was due to skin separation and healed with local dressings. No patient developed any complication which required surgical intervention. All cases of post-operative wound infection were successfully healed with appropriate antibiotics and local 10% povidone-iodine solution soaked gauze dressings. No case of recurrence was reported. Average hospital stay was one day except three patients (1.77%) who stayed for 2 days. (Table 4)

**Table 4:** Post-operative complications

Complications	Number of patients	Percentage
Infection	12	7.14%
Gaping of sutureline after removal of sutures	1	0.59%
Recurrence	0	0%

(N=168)

Most of the patients joined sedentary jobs on 5<sup>th</sup> post-operative day and normal routine job on 11<sup>th</sup> post-operative day. All patients (100%) were allowed to sleep supine on their back. No patient developed keloid after healing. Drain was removed on 3<sup>rd</sup> post-operative day but in 16 cases (9.50%) it was removed after one week and in 2 cases (1.18%) after 10 days. All these patients were on blood thinner, aspirin for years. Our technique of recurrence-free primary closure for pilonidal sinus is easy, simple, efficient, recurrence free and with short learning curve. Our technique also has low rate of post-operative complications and high rate of satisfaction with early return to work and normal life (Table 5).

**Table 5:** Satisfaction index

Grades of Satisfaction	Number of patients	Percentage
Quite Satisfied	167	99.40%
Satisfied	1	0.06%
Not Satisfied	0	0%

(N=168)

## Discussion

In search of a method with no or low recurrence various methods of pilonidal surgery are created including primary oblique excision and closure, marsupialisation, secondary healing, V-Y flap, Z-Plasty, Limberg flap, and Karydakias flap techniques [3, 4]. Pilonidal sinus is known to recur after surgery. Most of closed methods are aimed to reduce recurrence rate and healing time than open method. Karydakias noted that healing of the surgical wound in depth of natal cleft was poor and is the main cause of recurrence [5]. Karydakias flap technique's two goals were to eccentrically excise vulnerable tissue in the midline and to laterally displace the surgical wound out of midline gluteal cleft [6]. I have so far seen that midline natal cleft tissue is vulnerable but more than that the cause of failure and recurrence in midline repair is the tension on midline which makes it vulnerable. In my view if the tension on midline wound is removed, dead space formation avoided and the skin closure is meticulous avoiding inversion of any part of the incision then any type of wound will heal and a cumbersome flap making is avoided. Simple technique but meticulous dissection and repair can be done successfully even at small hospital. This procedure has one added advantage of not leaving a shallower natal cleft, natal cleft again becomes normal so patient doesn't feel abnormal with distorted anatomy.

Our method, taught us that every step should be done meticulously and not in hurry then only you can give good results. We have operated upon in primary cases and after recurrence. Few cases were 2-3 times operated elsewhere and then we did our method and achieved healing. We did not see single case of recurrence after our procedure. Only one person developed break down of skin after removal of sutures, the cause of it was his frequent travel in relation to his job. All patients were admitted to hospital for 24 hours or 1 day except 3 patients (1.77%) who were extra sensitive to pain and were kept for 1 more day, total of 2 days. Karydakias reported a hospital length of stay of 3 days [7], Guner *et al.* [8] and Al-Jaberi [9]; reported a hospital length of stay of 4 days.

Suction drain was removed on 3rd post-operative day in most cases. 16 cases (9.5%) required it to stay for one week and in 2 cases (1.18%) the drain was kept for 10 days. There was no seroma in any of our patients. All our patients were discharged with drain and were called on 3rd post-operative day for removal of drain. In Karydakias method also cavity drainage is used routinely to avoid seroma [10].

The absence from work was drastically reduced in our series as we allowed our patients to move normally after 3rd post-operative day after removal of suction drain. Patients were advised to join duties and do sedentary jobs after 5th post-operative day and join normal duty on 11th post-operative day. The persons doing strenuous jobs were advised to go to work after 14th post-operative day. Where as it takes 12.4-20 days in Karydakias method [11] and 3-4 weeks in other primary midline closure techniques [12].

In our series we did not select patients on the basis of weight and infection at the site of sinus. We included all patients of obesity, chronic infection and recurrence too. All cases of obesity, chronic infection and recurrence responded well and in same manner. I feel the success mantra lies in meticulous procedure, doing each and every step sincerely.

Pain, wound infection and seroma formation were main problems in original Karydakias technique as encountered by various surgeons doing Karydakias procedure. Wound infection ranged from 0 to 10.7% in various studies using Karydakias technique [13]. In our series the incidence of wound infection was

very low 7.14%, gaping of suture line after removal of suture was seen in one patient (0.59%). <1% Rate of recurrence was reported by Karydakias [14] but in our series no recurrence is so far seen with 5 years of follow-up.

All patients were allowed to sleep on their back from the first day. All patients were advised to keep the operated area dry and hairless. In our study, though the number of patients operated was not much, but the follow-up period was quite extensive and no recurrence showed the success of this procedure. The quality of life was reported good and comfortable by all patients except one as this patient had gaping of skin after removal of sutures which took almost 6 weeks to heal. Most of the patients were satisfied with this surgical procedure. The gluteal cleft was found maintained after operation which also helped patients as far as the cosmetic results are concerned. The scars formed after surgery were linear, broad and thick in different patients. No patient developed keloid. Use of toilet paper contributes towards development of pilonidal sinus as hairs are entrapped in natal cleft with faecal material while cleaning the anal area with toilet paper. Races who use water after defecation for cleaning have least incidence of pilonidal sinus. All our patients were advised to use water than toilet paper after defecation for cleaning.

## Conclusion

Our study showed that if this primary closure technique is done meticulously with each step done upto perfection the recurrence can be avoided or reduced to a considerable level. The post-operative discomfort and period of healing can also be reduced to a low-level.

Our method of surgery is an easy, efficient and simple procedure with no recurrence. Every step is equally important in avoiding the recurrence. It deals with and avoids all causative factors for recurrence. Our method rebuts the claim by other surgeons that primary midline closure surgery of pilonidal sinus is associated with high recurrence rate [15, 16]. The key to success is in doing every step meticulously, tirelessly with perfection and devotion. The surgeon's experience is more important to avoid recurrence in Karydakias procedure than mine as his procedure is technically more complex and difficult. Our technique is better than the complicated flap technique of Karydakias and other's.

## The reasons for no recurrence in our technique are

- 1) Avoiding the stress or strain on midline sutures by tension sutures.
- 2) Avoiding tension on suture line by undermining of full thickness wound edges.
- 3) Obliteration of dead space at natal cleft by absorbable sutures. Interrupted buried mattress sutures were used so the knot of suture and free end of suture were not projecting through suture line interfering with the healing.
- 4) Maintenance of meticulous haemostasis.
- 5) Meticulous closure of skin with bringing edges of skin in proper alignment and contact without inversion or eversion.
- 6) Pre and post operative use of epilation cream also helps in avoiding recurrence.
- 7) Use of suction drain in all cases helps in preventing collection of blood and development of infection which leads to disruption of the wound and then recurrence.
- 8) Removal of all visible blue tissues to not to leave any part of sinus track is utmost important. Surgical toilet with 10% povidone-iodine and hydrogen peroxide solutions is important step which helps in reducing the chances of infection and stimulates the healing by improving oxygenation of local tissues as tissues at sacrococcygeal

region suffer from low oxygen level probably due to pressure while lying flat.

- 9) Post operative wound care specially removal of hair is important for good healing without recurrence.
- 10) Requesting the pilonidal sinus patient to change the habit of using toilet paper to water cleaning after defaecation.
- 11) In our opinion there is no need of a symmetrical or lateral excision or flap making (Z-Plasty, Karydakes procedure, Bascom's procedure etc.) when a simple technique, like this can give better results.

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