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Evaluation of Rhomboidal Flap in Recurrent Pilonidal Sinus

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ABSTRACT

Background: A pilonidal sinus (PNS) is a small cyst or abscess that occurs in the cleft at the top of the buttocks. A PNS usually contains hair, dirt, and debris. It can cause severe pain and can often become infected. If it becomes infected, it may ooze pus and blood and have a foul odor. The exact cause of pilonidal sinuses is unclear. It is generally thought they are caused by loose hairs pushing into the skin. They could also be caused by deep layers of skin being stretched and moved, leading to a hair follicle rupturing.

Aim of the Work: The prospective study aimed at evaluating the outcomes of management of recurrent pilonidal sinuses by rhomboid flap. **Patients and Methods:** A prospective study of cases with recurrent pilonidal sinus, was done at the department of general surgery at In Al-Azhar University hospitals over the period from July 2017 with medium follow up period of three months.

Results: Age: ranged between 17 to 36 years with mean = 24.7±5.57. **Sex:** included 12 male and 8 female. **Conclusion:** Based on this study, it seems to us that the rhomboid flap is a good alternative for recurrent sacrococcygeal pilonidal sinus, especially for complex sinuses, and it could be appropriate for cases where simpler techniques have failed. It permits early return to complete activity, does not require prolonged postoperative attention, and has very low recurrence rate and postoperative morbidity which may compensate the inconveniences related to an unfavorable cosmetic look.

Keywords: Rhomboidal Flap, Recurrent Pilonidal Sinus, Sacrococcygeal Pilonidal Sinus.

INTRODUCTION

A pilonidal sinus (PNS) is a small cyst or abscess that occurs in the cleft at the top of the buttocks. A PNS usually contains hair, dirt, and debris. It can cause severe pain and can often become infected. If it becomes infected, it may ooze pus and blood and have a foul odor **(1)**.

The exact cause of pilonidal sinuses is unclear. It is generally thought that they are caused by loose hairs pushing into the skin. They could also be caused by deep layers of skin being stretched and moved, leading to a hair follicle rupturing **(2)**.

It has been postulated that hair penetrates into the subcutaneous tissues through dilated hair follicles, which is thought to occur particularly in late adolescence, though follicles are not found in the walls of cysts. Upon sitting or bending, hair follicles can break and open a pit. Debris may collect in this pit, followed by development of a sinus with a short tract, with a not clearly understood suction mechanism involving local anatomy, eventually leading to further penetration of the hair into the subcutaneous tissue.

This sinus tends to extend cephaled, likely owing to mechanical forces involved in sitting or bending. A foreign body-type reaction may then lead to formation of an abscess. If given the opportunity to drain spontaneously, this may act as a portal of further invasion and eventually formation
of a foreign body granuloma. Infection may result in abscess formation **(3)**.

Microscopically, the sinus where the hair enters is lined with stratified squamous epithelium with slight cornification. Additional sinuses are frequent. Cyst cavities are lined with chronic granulation tissue and may contain hair, epithelial debris, and young granulation tissue. Cutaneous appendages are not seen in the wall of cysts, meaning the cysts lack epithelial lining, unlike the sinus. Cellular infiltration consists of polymorpho neuclear lymphocytes (PMNs), lymphocytes, and plasma cells in varying proportions. Foreign body giant cells in association with dead hairs are a frequent finding **(4)**.

In summary, 3 pieces are instrumental in this process: (1) the invader, hair; (2) the force, causing hair penetration; and (3) the vulnerability of the skin. This process has been well characterized by Patey and Scarff as well as a number of other authors from the second half of the 20th century through today **(5)**.

We used a full thickness rhomboid-shaped flap which extends down to the gluteal fascia. This was then rotated into the defect created by excising the diseased tissue down to the presacral fascia. These flaps were renowned for their robust vascularity and therefore flap necrosis was not a major issue. Rather, the common complications are seroma or wound separation. These are variations of the rhomboid flap including the limberg and dufourmental flaps. The limberg flap has been modified and has successfully decreased the wound infection and separation rates even further. The modified limberg flap involved lateralizing the distal part of the midline suture line **(6)**.

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AIM OF THE WORK

The aim of this prospective study was to evaluate the outcomes of management of recurrent pilonidal sinuses by rhomboid flap.

PATIENTS AND METHODS

A prospective study of cases with recurrent pilonidal sinus, was done at the department of general surgery at In Al-Azhar University hospitals over the period from July 2017 with medium follow up period of three months.

Patients:

Inclusion criteria:

- Adult patients
- Recurrent pilonidal sinus.

Exclusion criteria:

- Umbilical or finger or any other site of pilonidal sinus.
- Acute stage of pilonidal sinus.

Methods:

- An informed consent has been taken from all patients involved in the study after approval by alazhar ethics committee.

Patient's preparation:

- Patients were admitted to hospital before operation.
- Full history and clinical examination were done.
- Full routine investigations were carried out which included complete blood picture, Prothrombin time and concentration, Blood glucose level, Serum creatinine, liver enzymes, serology and Blood typing.
- Hair removal from the middle of the back down to the back of the thigh by shaving.
- A prophylactic broad spectrum antibiotic (cefotaxime 1gm) was administered before the operation.

This prospective study included 20 patients with recurrent pilonidal sinus at Al-Azhar University hospitals over the period from July 2017 with medium follow up period of three months.

The collected results were statistically analyzed considering the following parameters.

- Age
- Sex
- Clinical presentation
- Previous procedure
- Operative technique
- Time of operative procedure (in minutes)
- Postoperative complications (infection, seroma, ischemia and necrosis, ugly scar)
- Follow up 3month
- Follow up 6month
- Postoperative recurrence

Patient's age and sex:

Age: range between 17to 36 years with mean = 24.7±5.57

Sex: include 12 male and 8female.

Statistical analysis

The data collected have been tabulated and analyzed using SPSS (statistical package for social science) on IBM compatible computer.

RESULTS

Table (1): Showing patients age and sex

Age	Mean ±SD	24.70 ± 5.57
	Range	17 – 36
Sex	Female	8 (40.0%)
	Male	12 (60.0%)

Clinical presentations: include recurrent 1st time (13 case), recurrent 2nd time (6 cases), recurrent 3rd time (1 case).

Operative technique: rhomboid flap all cases.

Table (2): Showing patients clinical presentation

		No.	%
Clinical presentation	Recurrent sinus first time	13	65.0%
	Recurrent sinus second time	6	30.0%
	Recurrent sinus third time	1	5.0%
Operative technique	Rhomboid flap	20	100.0%

Previous procedure: included previous open technique only (6 cases), primary closure only (7 cases), primary closure then open technique (3 cases), open then primary closure technique (2 cases), primary closure then karydakis (1 case), open then primary closure then karydakis (1 case).

Table (3): Showing previous procedure

Previous procedure	No.	%
Open	6	30.0%
Primary closuer	7	35.0%
Primary closure and open	3	15.0%
Open and primary closure	2	10.0%
Primary closure and karydakis	1	5.0%
Open and primary closure and karydakis	1	5.0%

Time of operative technique: ranged from 45 to 90 minutes with mean of 57±13.62 minutes.

Table (4): Showing time of operative procedure in minutes

Time of operative technique (Min)	Mean ±SD	57.50 ± 13.62
	Range	45 – 90

Post-operative complications: include infection (3 cases), seroma (1 case), ischemia and necrosis (1 case), and ugly scar (2 case).

Table (5): Showing postoperative complications

Complications	No.	%
None	13	65.0%
Infection	3	15.0%
Seroma	1	5.0%
Ischemia and necrosis	1	5.0%
Ugly scar	2	10.0%
Total	20	100.0%

Table (6): Showing the follow up of patients during 3 month and 6 months

Follow up		No.	%
After 3 months	Normal	16	80.0%
	Recurrence	1	5.0%
	Infection	3	15.0%
After 6 months	Normal	19	95.0%
	Recurrence	1	5.0%

Follow up during 6 months: include recurrence (1 case) ,normal (19 cases).

Table (7): Showing postoperative recurrence

Recurrent rate	No.	%
No	19	95.0%
Yes	1	5.0%
Total	20	100.0%

Post-operative recurrence: recurrence rate 5% (1 case only)

DISCUSSION

Pilonidal disease is an infection under the skin in the gluteal cleft. This is a common source of morbidity and loss of work productivity in healthy young adults [3].

A large number of surgical techniques (with varying complexity) have been described in the literature for the treatment of this disease; many of which are unfamiliar to general surgeons. Such diversity suggests that no single technique has emerged as the favorite to prevent recurrence of this condition. These include conservative non-excisional care, phenol injection, pit excision and tract brushing (Millar-Lord procedure), Bascom procedure, excision and leaving the wound to granulate, excision and marsupialization, excision and primary closure with mid-line or asymmetric incisions, or excision and closure using local flap. These latter included Karydakis procedure, Rhomboid and Limberg flaps, Modified Limberg flap, Z-plasty, V-Y flaps, oval rotational flaps, or other reconstructions. Each method has its own advocates [7]. Nevertheless, it seems to us that the rhomboid flap is a good alternative for recurrent sacrococcygeal pilonidal sinus, especially for complex sinuses, and could it appropriate for cases where simpler techniques have failed. It permits early return to complete activity, does not require prolonged postoperative attention, and has very low recurrence rate and postoperative morbidity which may compensate the inconveniences related to an unfavorable cosmetic look.

In this study the age ranged between 17to 36 years with mean = 24.7±5.57years which is slightly similar to results reported by ***Nareshkumar and Ramya*** [8] where the mean age was 26.2 years (range 19–36 years)**,** ***Jan et al.*** [9] mean age was 25 years (range of 17-45 years)**,** ***Ibrahim*** [10] used mean age of 23±5 years (range 17-30years)**,** ***Arumugam et al.*** [11] the median age was 28 years (range 16–64 years).

In this study, the results regarding to gender type 12 male (60%) and 8 female (40%) disagree with those reported by ***Nareshkumar and Ramya*** [8] who used 18 Male (90%) & 2 Female (10%), ***Jan et al.*** [9] **used** 40 male (83%) and 8 female (17%), ***Ibrahim*** [10] **(**18 Male (90%) & 2 Female(10%),0 ***Arumugam et al.*** [11] 47 males(88%) and 6 females (12%).

In this study, regarding to the Clinical presentations included in the recurrent 1st time (13 case), recurrent 2nd time (6 cases), recurrent 3rd time (1 case), and as regard to Previous procedure include previous open technique only (6 cases), primary closure only (7 cases), primary closure then open technique (3 cases), open then primary closure technique (2 cases), primary closure then karydakis (1 case), open then primary closure then karydakis (1 case).

In this study, with respect to the time of operative procedure, it ranged from 45 to 90 minutes with mean of 57±13.62 minutes which is longer than result reported by ***Nareshkumar and Ramya*** [8]**,** operative time was 44.4 minutes (range 40-50)**,** but nearly agreed with results reported by ***Jan et al.*** [9] operative time average of 55 minutes (ranged 40-70 minutes)**,** ***Ibrahim*** [10] operative time 50±4minutes (range 40-70)**,** ***Arumugam et al.*** [11] operative time 52±3minutes (range 40-75).

In this study the postoperative complications included infection (3case)15%, seroma (1 case) 5%, ischemia &necrosis (1case) 5% and ugly scar (2 case) 10%, among 20 case were 13 patients with complete healing without complications (65%), which is slightly agree with results reported by ***Nareshkumar and Ramya*** [8] Wound infection 1case (5%) Seroma 2 cases (10%) Flap necrosis none of cases (0%), ***Jan et al.*** [9] wound infection was reported in 6 patients(13%) seroma none of patients (0%)flap necrosis none of patients (0%), ***Arumugam et al.*** [11] wound infection was observed in 7 case (13%), but totally disagreed with results reported by ***Ibrahim*** [10] where no wound complications was remarked in the rhomboid flap group**.**

In this study considering postoperative recurrence (1 case only) the recurrent rate 5% which disagree to that reported by ***Nareshkumar and Ramya*** [(8),] none of the patient had recurrence of the disease (0%)**,** ***Ibrahim*** [(10)] none of patients had recurrence (0%)**,**but similar to results reported by ***Jan et al.*** [(9)] There was only 1case recurrence (2%), ***Arumugam et al.*** [(11)] 4 case developed a recurrence (7%)**.**

CONCLUSION

- Based on this study, it seems to us that the rhomboid flap is a good alternative for recurrent sacrococcygeal pilonidal sinus, especially for complex sinuses, and consider it an appropriate procedure for cases where simpler techniques have failed. It permits early return to complete activity, does not require prolonged postoperative attention, and has very low recurrence rate and postoperative morbidity which may compensate the inconveniences related to an unfavorable cosmetic look.
- Proper dressing and epilation of hair is the most important way of success of the operation.
- We suggest carrying out more trial on the rhomboid flap reconstruction technique for recurrent pilonidal sinus.

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