

Comparative Study of Primary Suturing Versus V-Y Advancement Flap Technique In Resurfacing Post Excisional Defect In Cases With Pilonidal Sinus Disease

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Abstract

BACKGROUND:

Multiple treatments has been identified for pilonidal disease but no protocol has been designed and studies emerged by comparing treatment cost, morbidity, and return to work state The primary aim of advancement flap is to transfer the scar tension that obtained from side-to-side closure to good cosmetic closure from flap.. For putting the flap, we need to know its dynamics. First step is movement of flap into the defect created by excision of pilonidal sinus. Flap movement demonstrates secondary defect. Primary purpose of flap is to closing the primary defect, while reducing secondary defect size.

AIM AND OBJECTIVES:

To compare the rate of occurrence and nature of complications in primary suturing and v-y advancement flap technique in resurfacing post excisional defect in cases with pilonidal sinus disease .

MATERIAL AND METHODS:

The study was a prospective, parallel group, comparative study among patients admitted with pilonidal sinus in general surgery wards at Govt. Rajaji Hospital, Madurai medical college, Madurai. Fifty patients were randomized into two groups of primary suturing and v-y advancement flap. Complications in both intraoperative and postoperative periods were noted and patients were followed up for 6months.

RESULTS:

The male: female ratio was noted to be approximately 5:1. The mean age of presentation of pilonidal disease is in the mid-twenties. Occupation has a role in the development of pilonidal disease. It seen in people who have a work pertaining to prolonged duration of sitting and close to vibrating surface. Disease is common in hirsute males with deep natal cleft and presence of sinus (single and/or multiple) is almost a constant feature of all patients who presented with pilonidal disease. The incidence of increased body mass index with the incidence and even recurrence of pilonidal sinus. The most common organisms found in the pilonidal sinus are the anaerobic organisms. Wound infection which was more (p value-0.04 significant) in primary suturing. Wound dehiscence was more (p value-0.04 significant) in the patients undergoing primary closure. Collection which was noted in patients undergoing both primary suturing and flap study. Recurrence rate is more (p value-0.018 significant) with primary suturing when compared with v-y advancement flap. Our study shows the hospital stay duration found to be very less (p value-0.000 significant) in patients treated with flap procedures than who underwent primary suturing.

CONCLUSION:

Pilonidal sinus is found more commonly in hairy, obese males with sedentary life style. It is treated more effectively, with no recurrence rate and less complications by wide local excision followed by asymmetric closure by unilateral or bilateral V-Y fascio-cutaneous advancement flap than primary closure

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I. Introduction

Pilonidal sinus disease was reported before 150 yrs. pilonidal disease incidence is 27 / 100,000 population. males preponderance is common, at a ratio of about 5:1. Seen in early twenties, decreasing in incidence after age 25 and after age 45 it is very rare.

Initially pilonidal sinus was considered of congenital origin than acquired disease.. it is considered as minor disease ' developed multiple theories based on etiology .. it was named as jeep rider disease. , multiple treatments has been identified for pilonidal disease but no protocol has been designed, and studies emerged by comparing treatment cost, morbidity, and return to work state. After 1965 multiple modalities arrived ,among

them are curettage the tracte/brushing with excision follicle opening , injection of phenol into the tract , pilonidal pit was cauterised , pilonidal sinus excision and lay open and allowed to heal by granulation , excision up to sacrum and either primary suturing or skin flaps . Asymmetric closure seems excellent as it has speedy recovery and minimal recurrence rate, low inconvenience to the patient, and early return to work.

The primary aim of advancement flap is to transfer the scar tension that obtained from side-to-side closure to good cosmetical closure from flap.. For putting the flap, we need to know its dynamics. First step is movement of flap into the defect created by excision of pilonidal sinus. flap movement demonstrates secondary defect. primary purpose of flap is to closing the primary defect, while reducing secondary defect size.

OBJECTIVES:

To compare the rate of occurrence and nature of complications in **COMPARATIVE STUDY OF PRIMARY SUTURING VS V-Y ADVANCEMENT FLAP TECHNIQUE IN RESURFACING POST EXCISIONAL DEFECT IN CASES WITH PILONIDAL SINUS DISEASE**

II. Materials And Methods

STUDY DESIGN

The study was a prospective, parallel group, comparative trial among patients admitted with pilonidal sinus in general surgery wards at govt.rajaji hospital, Madurai medical college, Madurai

STUDY METHODS

fifty patients were randomized into two groups

- ❖ PRIMARY SUTURING
- ❖ V-Y PLASTY GROUPS
- ❖ STUDY DURATION-6MONTHS
- ❖ ETHICAL CLEARANCE-OBTAINED
- ❖ CONSENT; INDIVIDUAL WRITTEN AND INFORMED CONSENT OBTAINED FROM ALL 50 PATIENTS
- ❖ CONFLICT OF INTEREST-NIL
- ❖ FINANCIAL SUPPORT-NIL

Eligibility Criteria

A. Inclusion criteria:

All patients undergoing PILONIDAL sinus excision

B. Exclusion criteria:

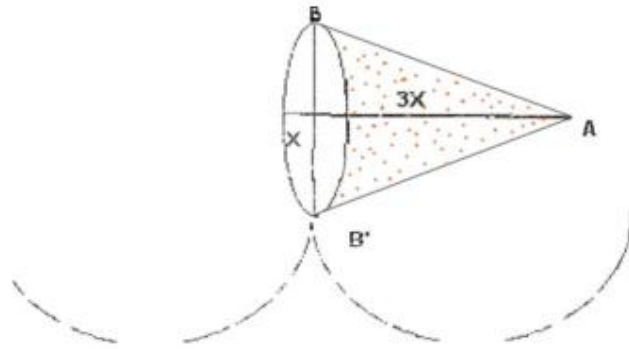
- ❖ Age Below 15 Years
- ❖ Patients With Acute Pilonidal Disease
- ❖ Pilonidal Abscess
- ❖ Malignancy

III. Methodology

All patients undergoing pilonidal excision at Government Rajaji Hospital attached to Madurai Medical college. This is Prospective study . A written informed consent to be obtained from patients to be included in the study and data collected on printed Proforma included eg: Age, history of related complaints, general examination,local examination, biochemical evaluation of blood sugar,blood urea,serum electrolytes,pus culture and sensitivity and plain x-ray abdomen].Each athe patient. Postoperative course was carefully observed and criteria managed to analyse morbidity, hospital stay,and secondary infections. postoperative antibiotics were given according to pus culture and sensitivity reports. complications, both intraoperative and postoperative were noted. Patients were folled up 6months

IV. Procedure

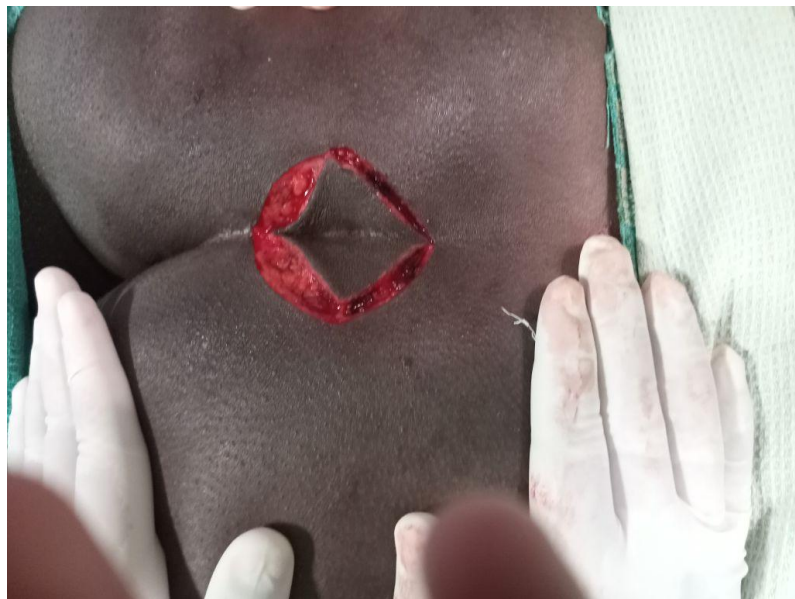
Wide local excision of the lesion was done after injecting methylene blue and hydrogen peroxide through sinus to remove all remnants during excision. While excising the sinus, care was taken to go vertically down to the fascia only, as extension below it will hamper its blood supply, also to avoid cavity during approximation. En-block removal of multiple sinuses was done.After minimal debridement, size of defect was reassessed.V-Y design was marked on both sides of defect. Breadth of the flap was equal to length of the defect for first few centimeters and gradually narrowing to form V. The length of the flap was equal to thrice the width of the defect.it is shown that 'X' is width of the defect and '3X' is length of the flap.While creating bilateral flap, length of two flaps has to be unequal, that is, 2X on one side and 3X on other side, so that the suture line is not in midline.While making the design, care was taken to avoid creating an acute angle at corners



skin markings for unilateral V-Y flaps

The incision was carried down to the fascia of underlying gluteus maximum muscle. The upper and lower arms of the flaps were elevated and advanced on gluteal muscle toward the midline interdigitating opposite arm. Even a few fibers of gluteus muscle were cut to increase the mobility of the flap. Care was to be taken to avoid undermining of the flap, and thereby reducing the chances of injuring the perforators. After releasing the flap from all sides, it seems to be falling in midline. The advancing edges were sutured to each other in two layers and initial V was sutured as Y to cover sacral defect with low tension over suture line, which avoids suture breakdown. The advancing edge of the flap was undermined from sacral fascia for about 2–3 cm, so as to be sutured to soft tissue of the opposite side thereby avoiding dead space. After elevating the flap from one side, we assessed feasibility of tension-free closure. When in doubt bilateral flaps of unequal dimensions were used to avoid midline scar and obliteration of natal cleft

The use of SUPERIOR GLUTEAL ARTERY perforator-based advancement flap principle, in repair of relatively large pilonidal sinus, helps in efficient redistribution of available tissue in addition to reducing tension along the suture line. Also, the suture line is not in midline, so chances of recurrence at the suture site are minimal. Fasciocutaneous V-Y advancement flap can be modified according to the local defect size as unilateral, bilateral, bilateral equal, and unequal V-Y advancement flap. No drain was kept in any of the patients as there was no dead space. The mean operative time for flap surgery was 1 h. The average post-operative stay was 4 days. After suture removal, patients were advised oil massage for flaps, application of silicon gel for scars, and shaving or depilation in some forms such as cream, hair remover, and laser in natal cleft.





V. Results

Pilonidal sinus is one of the least reported of diseases prevalent. Patients tend to seek advice mostly only when they are ridden with the complications of the disease and/or have a persisting disturbing discharging sinus. The patients presented to the doctor with complaints were only tip of the ice berg .Not many studies have been conducted in India to know the prevalence and incidence of the disease. Many go unreported and under diagnosed or even misdiagnosed. A total of 50patients were admitted with complaints relating to pilonidal disease and its complications. The above patients were included in the study; findings noted, appropriate treatment instituted and followed up for a period of 6months.

SEX INCIDENCE

The Indian male for obvious reasons like more hair distribution and occupation were noted to be more prone for the disease than the female counterpart. The male: female ratio was noted to be approximately 5:1.

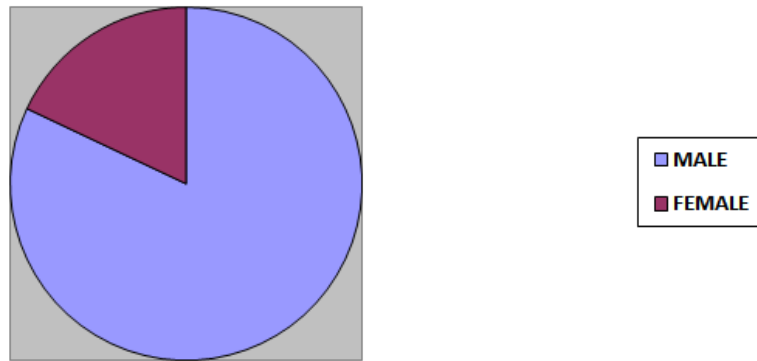


Table-1 Sex Incidence

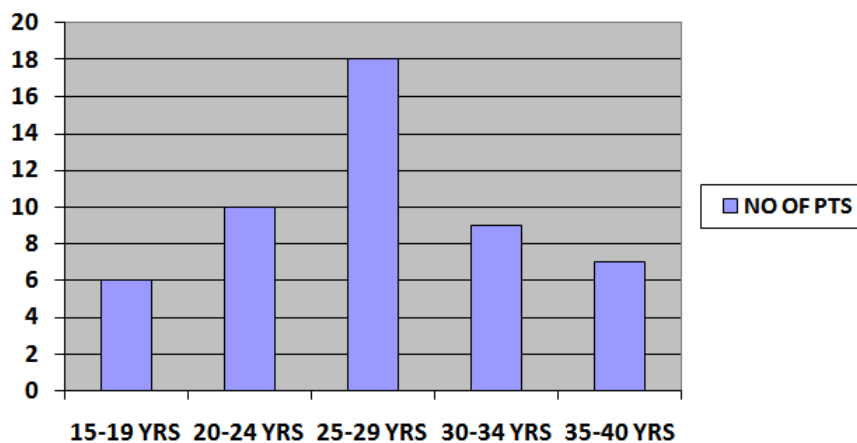
	Number of Patients	Percentage (%)
Males	41	82
Females	9	18
Total	50	100

AGE INCIDENCE

Pilonidal disease commonly affects the young people. It is not seen in the older age groups unless the cause has been because of poor previous treatment.

Table-2 Age Incidence

Age Group (in years)	Number of Patients	Percentage (%)
15-19	6	12
20-24	10	20
25-29	18	36
30-34	9	18
35-40	7	14
Total	50	100



As noted in the comparative study, the mean age of presentation of pilonidal disease is in the mid twenties

OCCUPATION INCIDENCE

Occupation has a role in the development of pilonidal disease. During the World War-II, it was found to be common among jeep driver, hence the name “*Jeep bottom*”. It seen in people who have a work pertaining to prolonged duration of sitting and close to vibrating surface.

Table-3 Occupational Incidence

Occupation	Number of Patients	Percentage (%)
Bus driver	6	12
Student	5	10
daily wager	6	12
Agriculturist	8	16
Garment factory worker	5	10
Shop keeper	6	12
Taxi driver	5	10
Auto driver	5	10
Clerk	4	8
Total	50	100

Though called “Jeep Bottom” as it was noted to be more common in the jeep drivers of the World War-II, there have been no definitive studies done to note that the disease is more common in patients who have history of prolonged sitting and those who are close to vibrating structures.

EXAMINATION FINDINGS

Table-4 Examination findings

Signs	Number of Patients	Percentage (%)
Swelling	40	80
Sinus	49	98
Discharge	47	94
Abscess	14	28
Deep Natal Cleft	50	100

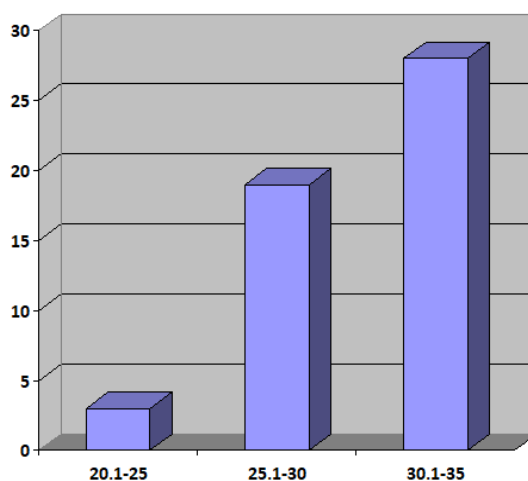
All patients has a deep gluteal cleft. Many patients has history suggestive of discharge in the sinus. Many patients has history of swelling. But the patients who presented with all the three had an abscess which required immediate intervention.

Disease is common in hirsute males with deep natal cleft and presence of sinus (single and/or multiple) is almost a constant feature of all patients who presented with pilonidal disease.

BODY MASS INDEX

The incidence of increased body mass index with the incidence and even recurrence of pilonidal sinus.

Body Mass Index	Number of Patients	Percentage (%)
20.1 – 25	3	6
25.1 – 30	19	38
30.1 – 35	28	56
Total	50	100



PUS FOR CULTURE SENSITIVITY

Many patients presented with both complaints of discharge and presence of discharge on presentation. so as prophylactic measure all patients pre-operatively underwent pus for culture and sensitivity test and appropriate antibiotics was started . next table shows the organisms cultureds from the site of sinus and its comparative analysis.

Table-7 Pus Culture Report

Organism	Number of Patients	Percentage (%)
Staphylococcus aureus	12	24
Pseudomonas aeruginosa	3	6
Bacteroides fragilis	17	34
Escherichia coli	10	20
Proteus mirabilis	3	6
Mixed growth	3	6
No growth	2	4
Total	50	100

IT concluded that the most common organisms found in the pilonidal sinus are the anaerobic organisms.

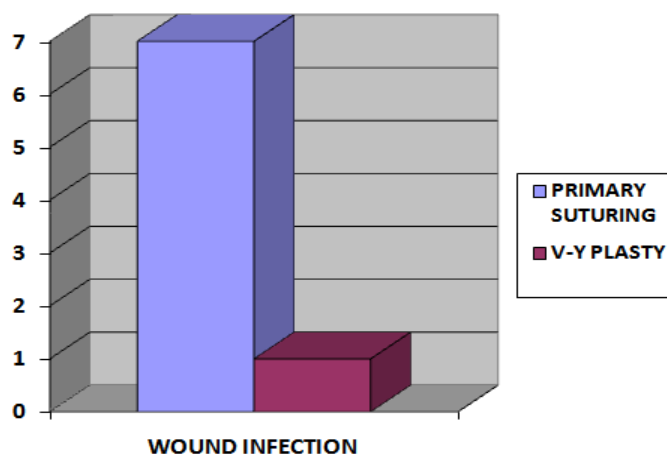
INCIDENCE OF COMPLICATIONS

The most common complications encountered in this study were:

- ❖ Wound infection which was more in primary suturing
- ❖ Wound dehiscence was more in the patients undergoing primay closure
- ❖ Collection which was noted in patients undergoing both primary suturing and flap study.

Incidence of wound infection

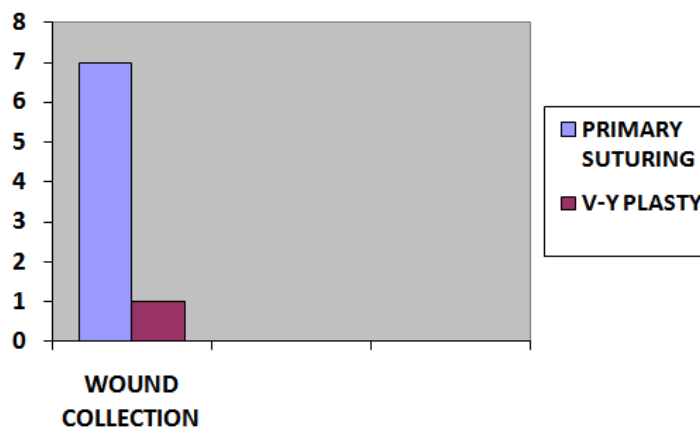
PROCEDURE	NO.PATIENT	WOUND INFECTION
PRIMARY SUTURING	25	7
V Y PLASTY	25	1



P VALUE-0.04 SIGNIFICANT

Incidence of wound Collection

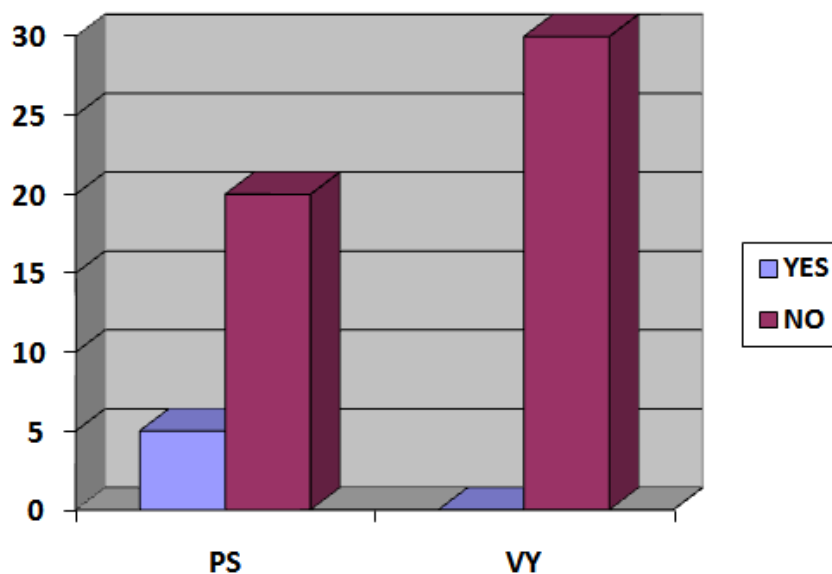
PROCEDURE	NO.PATIENT	WOUND COLLECTION
PRIMARY SUTURING	25	7
V Y PLASTY	25	1



PVALUE-0.04 SIGNIFICANT

Incidence of Wound Dehiscence

PROCEDURE	NO.PATIENT	WOUND DEHISCENCE
PRIMARY SUTURING	25	5
V Y PLASTY	25	0

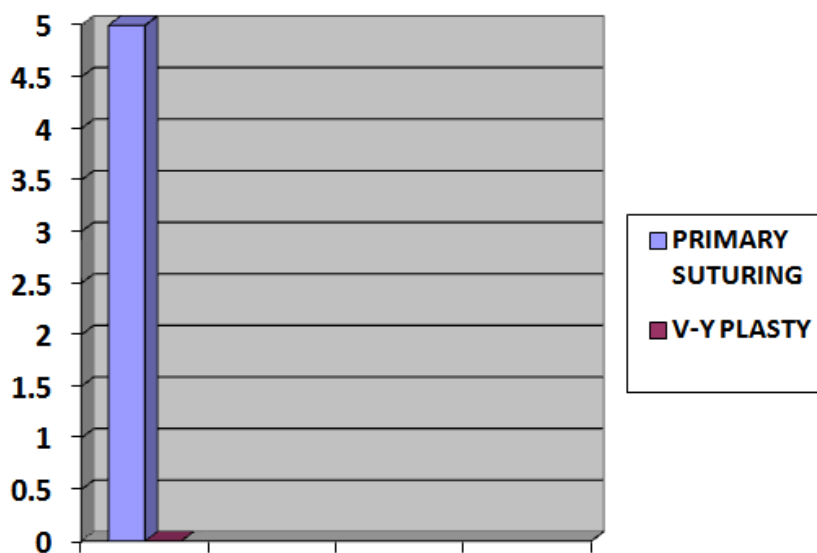


PVALUE-0.001 SIGNIFICANT

RECURRENCE

Recurrence rate is more with primary suturing when compared with v-y advancement flap

PROCEDURE	NO OF PTS	RECURRENCE
PRIMARY SUTURING	25	5
V-Y PLASTY	25	Nil

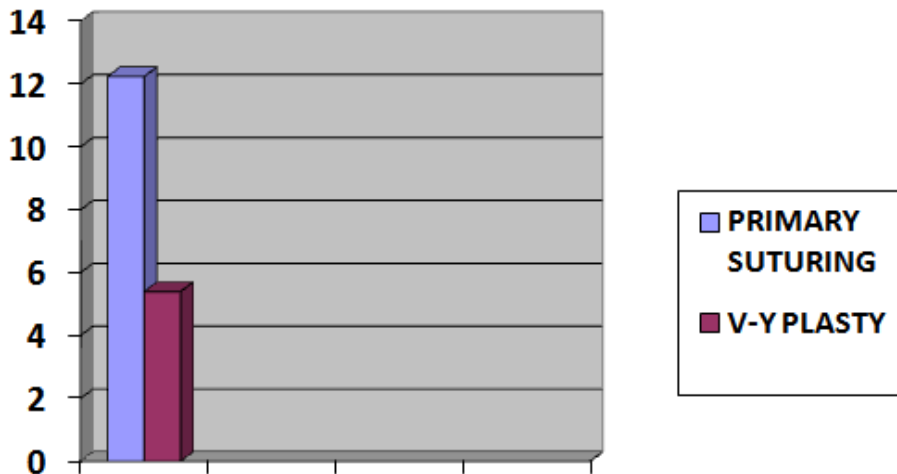


PVALUE-0.018 SIGNIFICANT

DURATION OF HOSPITAL STAY

Our study shows the hospital stay duration found to be very less in patients treated with flap procedures than who underwent primary suturing.

PROCEDURE	MEAN DURATION OF HOSPITAL STAY
PRIMARY SUTURING	12.24
V-Y PLASTY	5.4

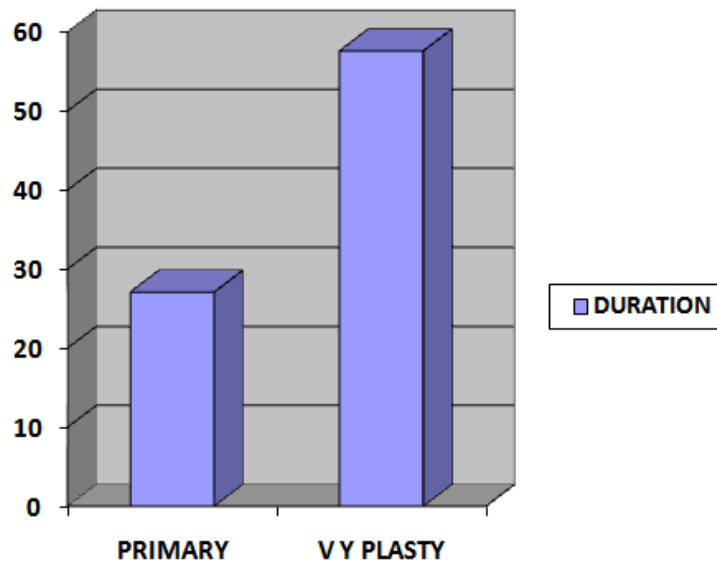


DURATION OF HOSPITAL STAY

P VALUE-0.000 SIGNIFICANT

DURATION OF SURGERY

	MEAN
PRIMARY SUTURING	27.08
V Y PLASTY	57.6



PRIMARY SUTURING

V Y PLASTY

P VALUE - 0.000

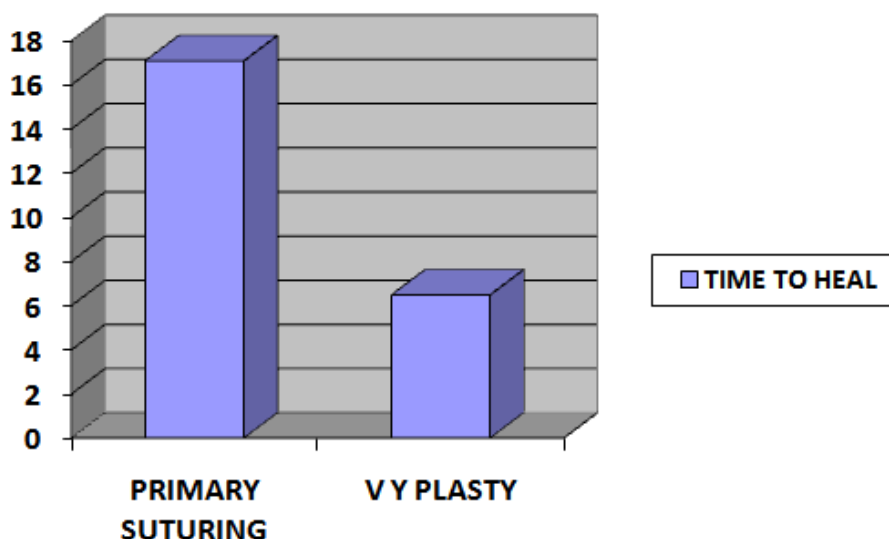
SIGNIFICANT

TIME TAKEN TO HEAL

The total time taken for the wound/flap to heal was noted to be significantly lower in patients undergoing v-y flap procedure. This correlates with studies that prove that the average time taken for wide excision and primary suturing to heal is about 17.08 days . In patients undergoing V-Y flap procedure, the healing time noted in the present study is 6.48 days.

PROCEDURE	TIME TO HEAL
PRIMARY SUTURING	17.08
V-Y PLASTY	6.48

P VALUE-0.000 SIGNIFICANT



VI. Discussion

Pilonidal sinus is a chronic intermittent disorder of the sacrococcygeal region and its treatment, usually surgical, remains controversial. Factors implicated in its etiology are large buttocks with deep natal cleft , adolescent or young males with positive family history, folliculitis at another site, obesity , occupations requiring prolonged sitting, traveling or driving, excessive body hair and poor local hygiene . Although various modalities of treatment have been described, no consensus has emerged as all have met with varying degrees of recurrence The two main factors were responsible for recurrence due to hair penetration, namely, the depth of the cleft and the presence of a portal of entry for hairs in the midline (the wound) Surgical treatment of chronic pilonidal sinus by excision of the diseased tissue down to the presacral fascia is generally accepted, but the management of the remaining defect is still a matter of debate. Many methods have been described such as (1) open excision, (2) primary closure, and (3) excision and flap closure. Open excision and healing by the secondary intention technique is associated with long hospitalization, wound dressing daily, increased postoperative morbidity, loss of work days, and poor cosmetic outcome due to wide unacceptable scars Primary closure of the wound is a simple technique, but it has a high recurrence rate (5–7%) due to continuing deep natal cleft . Excision with local flap procedures has the lowest recurrence rates, but they are more technically demanding and their use is generally restricted to recurrent complex pilonidal sinus, there was no recurrence in the flap method. This could be explained by placing the scars away from the midline, thus avoidance of portal entry of hairs in the midline (the wound) and flattening the natal cleft to reduce friction, local warmth, moisture, and hair accumulation. To address the flap survival of the technique, gluteal perforator vessels could have contributed to its viability in penetrating through the fascia to the overlying skin . Pilonidal sinus never begins on a convex surface and the primary source of surgical failures is the shape of the gluteal cleft, which creates the moist, warm, bacteria-friendly environment and thus reducing the depth of the concave fold that harbors the problem.

The Z-plasty procedure has been described by Monro and MacDermot. The disadvantage of this procedure is that the part of the wound is in the midline, which is the main cause of recurrence. Besides the flap tip, necrosis has been reported. Z-plasty requires back cuts and incisions at specific angles and is not supplied by robust perforators like V-Y-plasty, technically demanding as geometrical planning is involved.

The W-plasty technique has been described by Roth and Moorman. but some part of the wound was in midline and recurrence rate was high.

The Limberg flap is another transposition technique; it is suitable only for closure of rhomboid defects with angles of 60 and 120° and the flap depends on the looseness of adjacent skin. Reported complication and recurrence rates are 6 and 4%, respectively The Limberg flap scores in simplicity, but it needs excessive mobilization. It also needs an expert surgeon and more excision of a normal skin for making the rhomboid shape of 60 and 120°. Closure of the defect with Limberg flap seems to be elliptical rotation flap at first glance . however, it creates a line of tension along the radius of the arc that may necessitate back cuts. This decreases the blood supply to the flap. It has recurrence rate of 8% .

Perforator-based flaps require meticulous technique and expertise. These flaps are having the long learning curve and having the risk of terminal necrosis.

V-Y advancement flap is easier to perform. The flap has excellent blood supply and can be raised safely without dissecting of the pedicle. flap, which can be quickly harvested, and has got a lesser learning curve.

Our technique is simple and reliable and offers an effective and elegant alternative to the more classic operations for pilonidal sinus as it has the advantage of being tension-free closure without leaving dead space, thus increasing patient comfort and wound healing, and decreases the length of hospital stay with early return to work. It does not only remove the existing sinus but also eliminate factors that predispose to formation of another sinus by placing the scars away from the midline and flattening the natal cleft, and it is useful for recurrent cases after a failed surgical procedure and it gives good cosmetic results without any early or delayed recurrence.

VII. Conclusion

V-Y-plasty is better choice among the flaps as it is less demanding, it is not operator dependent.

So, conclude that pilonidal sinus, which is found more commonly in hairy, obese males with sedentary life style. it is treated more effectively, with no recurrence rate and less complications by wide local excision followed by asymmetric closure by unilateral or bilateral V-Y fasciocutaneous advancement.

VIII. Summary

- Pilonidal disease is a disease that is not routinely reported.
- Though common in the natal cleft, extra natal sites also have been reported.
- It is an acquired condition due to various predisposing factors.
- It is more common in males compared to the females.
- It affects young adults and is rarely seen after the age of 40 yrs.
- Presentation may vary from asymptomatic pits to chronic pain and discharging sinuses and acute presentations of abscess.
- Patients with an increased body mass index and those with a deep natal cleft are more prone for it.
- Patients who work for prolonged sitting and those close to vibrating machinery are more prone to develop this disease.
- The most common organisms isolated from the pilonidal sinus are anaerobes.
- Though sterile cultures and occasional mixed growth is also noted.
- The main goals of pilonidal treatment are maintaining good personal hygiene and regular epilation of the local area and a definitive good surgical procedure.
- ∅ The main stay for treatment of pilonidal abscess is incision and drainage through a lateral incision away from the mid line.
- ∅ This is not a definitive procedure and the rates of recurrence are very high.
- ∅ There are a wide variety of treatments both surgical and non-surgical that are advocated in the management of pilonidal disease.
- ∅ All treatments have their own advantages and disadvantages with respective complications and recurrence rates.
- ∅ Among all, it is the flap procedures which have a low recurrence, less duration of hospital stay and early return to work.
- ∅ Hence flap techniques-is the most effective surgery to treat pilonidal disease.

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