

Limberg flap is better for the surgical treatment of pilonidal sinus. Results of a 767 patients series with an at least five years follow-up period

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Rezumat

Lamboul Limberg este mai bun în tratamentul chirurgical al bolii pilonidale. Rezultatele unei serii de 767 pacienți cu o perioadă de urmărire de minim 5 ani

Scop: Boala pilonidală este o afecțiune dobândită, întâlnită de obicei la bărbații tineri. Acest studiu retrospectiv descriptiv a fost efectuat pentru a determina efectele suturii primare, marsupializării și a lamboului Limberg în tratamentul bolii pilonidale în ce privește perioada până la reîncadrarea în muncă, infecția și rata de recurență.

Metodă: 823 pacienți au fost operați de aceeași 2 chirurghi, practicându-se excizia largă a leziunii. La unii pacienți s-a practicat sutură primară (Grupul 1) la alții marsupializare (Grupul 2) și la un număr de pacienți s-a efectuat reconstrucție cu lambou Limberg clasic. Tipul intervenției chirurgicale a fost decis de chirurgul operator. În ianuarie 2010, 767 dintre cei 823 pacienți au putut fi găsiți și s-a efectuat un interviu telefonic planificat.

Rezultate: 767 pacienți (85 femei, 682 bărbați) cu o vârstă medie de 25,8 ani au fost incluși în studiu. În "întoarcerea la serviciu (zile)" perioadele au fost semnificativ statistic diferite între grupuri ($p < 0,001$). Perioada până la reîncadrarea în muncă a fost semnificativ mai mică în grupul cu sutură primară comparativ cu grupul cu marsupializare. În grupul cu reconstrucție cu lambou Limberg rata de infecții de plagă a

fost mai mică cu 4.7%. Cea mai mare rată de recurență s-a înregistrat în grupul cu sutură primară. S-a observat o diferență semnificativă statistic ($p < 0,001$) între tipurile de intervenții chirurgicale în ceea ce privește rata de recurență.

Concluzie: Datorită vindecării mai rapide, a întoarcerii mai repede la muncă și a ratelor mai mici de infecție și de recurență, reconstrucția cu lambou Limberg este mai bună în boala pilonidală.

Cuvinte cheie: boală pilonidală, tratament chirurgical, sutură primară, marsupializare, lambou Limberg

Abstract

Purpose: Pilonidal Sinus Disease (PSD) is an acquired condition usually seen in young adult males. This descriptive retrospective study has been performed to determine effects of primary suture, marsupialization and Limberg Flap for the management of PSD on the outcomes of return to work period, infection and recurrence rates.

Methods: 823 patients were operated by same two surgeons, wide excision was done. Some patients were primarily closed (Group 1), some marsupialized (Group 2) and to a number of patients Classic Limberg (Rhomboid) Flap (Group 3) was applied. The type of the surgery was judged by the operating surgeon. In January 2010, 767 of 823 patients could be reached, and a planned telephone interview was done.

Results: 767 patients (85 Female, 682 Male) with the median age of 25.8 were in the study. In "Return To Work (Days)" periods, there is statistically significant difference between groups ($p < 0.001$). The Return To Work Period is quite shorter in primary closure group compared with marsupialization group. In Limberg Flap Group the surgical site infection rate is

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the smallest with 4.7%. The highest recurrence rate is in the primary closure group. There is a statistically significant difference ($p < 0.001$) between the surgery types for the recurrence rates.

Conclusion: Because of earlier healing, shorter return to work and lower rates of infection and recurrence, limberg flap is better for PSD.

Key words: pilonidal sinus, surgical treatment, primary closure, marsupialization, Limberg Flap

Introduction

Described more than a century ago; Pilonidal Sinus Disease (PSD) initially thought to be congenital but now accepted to be an acquired condition usually seen in young adult males (3,5). The estimated incidence is 26 per 100000 people affecting men twice as often as women (10). The etiology is uncertain but relates to the implantation of loose hair in to the depth of natal crease. A deep natal cleft is a favorable environment for sweating, maceration, bacterial contamination and penetration of hairs (2). This loose hair caused a foreign body reaction that leads to midline pit formation (3).

These chronic discharging wounds cause pain and impact upon quality of life (10).

There has been a debate about the treatment of PSD for many years. Controversy still exists regarding the best surgical technique which minimizes disease recurrence and patient discomfort. Although many surgical and nonsurgical treatment methods have been described, the ideal treatment method has not been established for PSD. The main purpose is complete, wide excision but the debate is what to do with the wound after excision. Excision and packing, excision and primary closure, marsupialization and flap techniques are the surgical procedures that have been suggested for treatment (15,16).

This study has been designed to determine relative effects of open surgical techniques compared with closed techniques for the management of PSD on the outcomes of healing time (return to work period), infection and recurrence rates.

Materials and Methods

This study is a descriptive retrospective study performed to find out the best surgery type for the treatment of PSD.

Between 1999 and 2005, 823 patients were operated by the same senior surgeons who had been trained in the same Surgery Clinic (SSK Ankara Education Hospital General Surgery Unit). The patients were operated in Diyarbakir Military Hospital in the period of 1999-2000 by Surgeon GO, in Ankara SSK Hospital and in various private hospitals in Ankara by Surgeon GO and Surgeon FY during 2000-2005 period.

All of the patients were diagnosed as primary PSD, no secondary cases were included. Their citizenship numbers,

contact informations and phone numbers had been noted carefully. After the preoperative preparations the night before surgery the hair of gluteal and sacral regions was shaved.

All the patients were operated under spinal, epidural or general anesthesia in the position of prone jackknife. Peroperative intravenous single dose Cephazolin Sodium was administered to all patients. After injecting enough amount of Metilen Blue into the PS orifices wide excision was done. Then some patients were primarily closed (Group 1), some marsupialized (Group 2) and to a number of patients Classic Limberg (Rhomboid) Flap Procedure (Group 3) was applied. The type of repair was judged by the surgeon before and during the surgical process. The repair techniques were applied by the internationally accepted surgical rules and by using the same kind of surgical materials.

In Group 1 after wide excision hemostasis was achieved by electrocautery. After placing a 7F suction drain onto the fascia, the defect was closed primarily, by 1-0 Prolene Ethicon interrupted full thickness mattress sutures, subcutaneous 2-0 Vicryl Ethicon sutures and cutaneous 4-0 Rapid Vicryl Ethicon sutures.

In Group 2, after electrocautery hemostasis the skin defect was partially closed by interrupted 2-0 Vicryl Ethicon wound margin inverting sutures on to the fascia.

In Group 3, a rhomboid - shaped excision and electrocautery hemostasis were carried out. A left or right sided Limberg transposition Flap, incorporating the gluteal fascia, was fully mobilized on its inferior edge and transposed medially to fill the rhomboid defect; the defect on gluteal region was closed primarily. The subcutaneous layers were approximated with 3-0 Vicryl Ethicon interrupted sutures over a 7F suction drain, and the skin was closed with 3-0 Prolene Ethicon sutures.

The average postoperative hospital stay period was one day. All of the patients were followed for at least seven days after the operation by the surgeon. And infection and other complications had been noted.

In January 2010 after a time interval of maximum 10 years (first patient operated) and minimum of 5 years (last patient operated) a retrospective descriptive study was designed.

767 of 823 patients could be reached by the surgeons, and a planned telephone interview was done. All of these telephone contacted and personally interviewed patients agreed to take part in this interview study. Patients were interviewed about return to work, postoperative infection and another surgery because of recurrence. In order to define postoperative "Return To Work" Period, the patients were asked when they felt comfortable and convenient to start to work and full daily activities (12). "Postoperative infection" was defined as the purulent discharge, inflammation and pain around the wound side that prolongs dressing time. "Recurrence" was defined as admittance to a health centre and to be diagnosed or to be operated as recurrent PSD.

Return To Work Periods according to different surgery types has been compared by ANOVA Test. In order to analyse operation type according to "infection" and "recurrence"

Pearson Chi-Square Test has been used ($p < 0.001$) values have been accepted as statistically significant).

Results

In our study group of 767 patients (85 female, 682 male); and the median age was 25.8.

Return To Work Periods have been listed in the following tables (Table 1, 2, 3, 4).

ANOVA Test has been used in order to compare the 3 groups. In the "Return To Work (Days)" periods, when analysed according to 3 different surgery types (Group 1, Group 2, Group 3). In Group 1 (Primary Suture) the mean value is 14,55 days, in Group 2 (Marsupialization) the value is 36,09 and in the 3rd Group (Limberg Flap) it is 21,08. There is statistically significant difference between each group ($p < 0.001$). The Return To Work Period is quite shorter in primary closure group compared with marsupialization group.

In our study Group 3 (Limberg Flap) the surgical site infection rate is the smallest with 4,7% whereas the rates are 8% in primary closure group and 6,2% in the marsupialization group. There is not a statistically significant difference between the three surgery modalities for the infection rates although most surgeons tend to think the infection rates are lower in open techniques.

In our series recurrence rates are 11,7% (Group 1), 4,4% (Group 2) and 4,7% (Group 3) consecutively. The highest recurrence rate is in the primary closure (Group 1). There is a statistically significant difference ($p < 0.001$) between Group 1 and the other surgery types (Group 2 and Group 3) for the recurrence rates.

Discussion

PS is a fairly common condition (26 per 100000 people affecting men twice as often as women) which is associated with significant morbidity. It is a disabling and acquired disease that affects active young people. That is why; PS Disease is related with important economic impacts and associated with frequent inability to work and discomfort. Men are thought to be at higher risk because of their more hirsute nature. Risk factors include adiposity, sedentary occupation - life style, local irritation-trauma, insufficient body hygiene, excessive hairiness and perspiration (9,11).

The ideal treatment modality of PS should provide reliable healing with a high potential of cure and a low recurrence rate. And "return to work period" should be as short as possible because of the economic impacts (14,15). Although surgery is the only reliable method for treatment of PSD, there isn't any surgical treatment method that consensus has been achieved.

Various surgical methods can be performed for treating PS. Wide and deep excision is the common technique but the question is about the next step. This can be primary closure, marsupialization or different flap techniques. Despite the controversy about the best surgical technique for the treatment of PS, an ideal operation should minimize

Table 1. Return To Work Period (Days)

Mean	23,89
Median	21,00
Std. Deviation	9,814
Minimum	9
Maximum	45

Table 2.

Type of Surgery		Return To Work Period (Days)	
		N	
Primer S.	Mean	300	14,55
	Median		14,00
	Std. Deviation		2,117
	Minimum		9
	Maximum		21
Marsupialization	N	274	
	Mean		36,09
	Median		35,00
	Std. Deviation		3,226
	Minimum		22
Limberg	Maximum		45
	N	193	
	Mean		21,08
	Median		21,00
	Std. Deviation		2,366
	Minimum		15
	Maximum		30

Table 3.

Surgery Type Versus Infections		Infection	
		No	Yes
Surgery type	primary	276 (%92,0)	24 (%8,0)
	marsupialization	257 (%93,8)	17 (%6,2)
	limberg	184 (%95,3)	9 (%4,70)
Total		717 (%93,50)	50 (%6,50)

Table 4.

Surgery Type Versus Infections		Recurrence	
		No	Yes
Surgery type	primary	265 (%88,3)	35 (%11,7)
	marsupialization	262 (%95,6)	12 (%4,4)
	limberg	184 (%95,3)	9 (%4,7)
Total		711 (%92,7)	56 (%7,3)

financial cost, allow patients to return earlier to work, be simple to perform, inflict minimal pain and have a low disease recurrence rate (5).

After total wide and deep excision of chronic tracts, when marsupialization is done the long healing time and discomfort are the major problems for the patient. Primary closure has the advantage of shorter healing time but higher recurrence rate is a serious problem in this technique. Also the highest postoperative infection rate is also noted in primary closure group (5,13).

Flap techniques have been associated with lower infection and recurrence rates, shorter hospital stay and better aesthetic results.

There is a wide range of recurrence rates in PSD, which has been attributed to variety of phenotypical and behavioral characteristics. PSD may recur up to 22 years after first surgery (1). But a period of 5 years is reasonable and practical follow up period for PSD. In our series the patients have been followed up to a minimum of 5 years and a maximum of 10 years.

Pilonidal Sinus Disease is more common among young male adults which means that the longer convalescence period postoperatively, the less economically productive this group is. This makes the "Return To Work" outcome a very important factor in determining the optimal surgical procedure. It is perhaps unsurprising to state, open surgical wounds that are left to granulate take longer to heal than surgically closed wounds (10). In our study Return To Work Period is quite shorter in primary closure group compared with marsupialization group (14,55 days versus 36,09 days). The mean value of Return To Work period in Limberg Flap Group is 21,08 days.

There were no statistically significant differences in infection rates between open wound healing and primary wound closure, regardless of suture line position. This is contrary to the general surgical consensus that open wound healing is more likely to result in fewer postoperative infections. However when midline closure was compared with off-midline, a statistically significant difference was found in favour of off-midline closure. The superiority of the off-midline technique was supported in a review by Petersen 2002 (10). In our study, Group 3 (Limberg Flap) the surgical site infection rate is the smallest with 4,7% whereas the rates are 8% in primary closure group and 6,2% in the marsupialization group. The difference is not statistically significant in our study also.

Recurrence of pilonidal sinus disease was the most commonly reported outcome by most of the studies examined in the literature. Open healing was associated with a significantly lower recurrence rate than primary surgical closure (all techniques) (10). Our recurrence rate is in the primary closure group. There is a statistically significant difference ($p < 0.001$) between the surgery types about the recurrence rates. There is no significant difference between marsupialization and limberg flap technique in our series. Also the gross disadvantage of primary closure technique about recurrence; is an important point while deciding about the type of operation for PSD.

Conclusion

When we take into account, our 767 patient study group results, we recommend Limberg Flap Repair Technique for PSD. This technique has an acceptable "short" Return To Work Outcome when compared with open techniques. It has the smallest postoperative infection rate. Limberg Flap Repair Technique has a low recurrence rate which is similar to marsupialization. Earlier healing, shorter return to work and lower rates of infection and recurrence are the major factors that affects our preference.

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Conflict of interest statement

Gokhan Osmanoglu and other co-author have no conflict of interest.

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