Etiological Factors in Umbilical Pilonidal Sinus

Ali Coşkun · Hakan Buluş · Ömer Faruk Akıncı ·
Abdullah Özgönül

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Abstract The objective of this study is to investigate factors leading to the development of umbilical pilonidal sinus (UPS). 31 patients with UPS treated at Harran University and Keçiören State Training Hospital between January 1997 and November 2007. 100 consecutive volunteer outpatients were administered questionnaire. The questionnaire included questions on age, sex, profession, body mass index (BMI), skin color, hirsute status, frequency of taking baths, personal history of pilonidal sinus (PS), family history of PS, and whether they wear tight clothes and whether they use belt. The results obtained from two groups were compared. UPS is one of the PS group diseases and involves umbilical

region. There was statistically significant difference between the patient and control groups in terms of age, profession, hirsute status, familial history of PS, wearing tight clothes and BMI. Improvement in these factors may contribute to the reduction of the prevalence of the disease.

Keywords Umbilical pilonidal sinus (UPS) · Sacrococcygeal pilonidal sinus (SPS) · Etiological factors

Introduction

Pilonidal sinus term includes the etymological roots of pilus (a hair) and nidus (nest). The term pilonidal sinus was first coined by Hodges in 1880 [1]. Pilonidal sinus of the umbilicus is not frequently reported, with only 18 cases having been reported in the literature since 1956, when Patey and Williams reported the first case [2].

PS occurs in many areas of the body such as web of fingers, penis shaft, sacrococcygeal area and navel. Patients with PS complain of pain, purulent discharge, swelling and scaling of the perisinus area.

PS was originally thought to be of congenital origin, but the presence of interdigital pilonidal sinus in barbers suggests that it may be acquired [3]. The mechanism of PS formation was first described as hair movement from the surrounding skin under frictional impact, which may puncture the skin as suggested by Patey and Scarff in 1940–1950 [4]. In view of the studies of Boscom and Karydakos, the pathology of the development of PS has been clarified at present [4, 5].

PS is seen most commonly in the sacrococcygeal area. UPS is a rare form of the disease with few published reports on it. However, it may be actually more common than thought and may be found more frequently if sought specifically.

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A. Coşkun · H. Buluş (✉)
Department of General Surgery,
Keçiören Training and Research Hospital,
Pınarbaşı mahallesi Sanatoryum caddesi Ardahan sok.no:1 Keçiören,
06310 Ankara, Turkey
e-mail: hakan_bulus6@hotmail.com

A. Coşkun
e-mail: dralicoskun@gmail.com

Ö. Faruk Akıncı
Department of General Surgery,
Umraniye Training and Research Hospital,
Adem Yavuz Street 1,
İstanbul, Turkey
e-mail: ofarukakinci@yahoo.com

A. Özgönül
Department of General Surgery,
Harran University Medical Faculty,
Yenişehir Yerleşkesi Number: 63300,
Şanlıurfa, Turkey
e-mail: ozgonul2004@yahoo.com

Material and Methods

31 patients with UPS treated at Harran University and Keçiören State Training Hospital between January 1997 and November 2007 were enrolled in the study. After taking ethical approval, with questionnaire, patients were studied about their age, sex, body mass index, profession, skin color, personal history of PS, family history of PS, how frequently they take a bath, hirsutism status and whether they wear tight clothes and use belt. Findings obtained from patients with UPS were compared with those from 100 consecutive control patients without UPS. Control group was organised 100 consecutive volunteer patients after a patients with UPS. So at the end of the study group I (patient group) consist of 31 patients and group II (control group) consist of 3100 volunteer that administered to the general surgical policlinics.

Patients with known underlying causes of umbilical sinus tract formation following laparoscopic cholecystectomy, those diagnosed with urachal anomalies and omphalomesenteric anomalies through radiological investigation and who underwent umbilical operation were excluded from the study.

SPSS software was used for the statistical analysis. Chi square test and Student's t test were used for statistical comparison. P value of <0.05 was considered statistically significant.

Results

Mean age of our patients was 24.38 (16–40) and 27 of them (87%) were male. The majority comprised students (n:16, % 51). Mean BMI value was 23.89 while it was 26.64 in the

control group. Skin color distribution was as follows in both groups. In patient group 54% (n=17) had dark, 32% (n=10) brunette and 12% (n=4) fair skin while the corresponding figures were respectively 48% (n=48), 34% (n=34) and 18% (n=18) in the control group. Excessive hirsutism was found at the rate of 48% (n=15) in the patient whilst its rate was 17% (n=17) in the control group. The number of patient who take two or less baths a week was 19 (61%) in the patient group, while it was 32 (32%) in the control group. Individual history of Pilonidal Sinus was found at the rates of 19% (n=6) and 7% (n=7) in control and patient groups and family history 32% (n=10) and 11% (n=11) respectively. Wearing tight clothes was seen at 74% (n=23) of the patient group and 35% (n=35) of control group. 80% (n=25) of the patient group and 63% (n=63) of the control groups reported wearing belt. (Table 1)

When control and patient groups were compared, a statistically significant difference has been found between, patient and control groups in terms of age, profession, status hirsutism, family history of PS, wearing tight clothes and BMI. However, no statistically significant difference has been found between control and patient groups in terms of sex, color of skin, the frequency of taking bath, individual history of PS, and wearing belt.

Discussion

Determination of the etiological factors will not only contribute to the prevention of disease, but also help the choice of surgical technique.

UPS is a rare disease compared to SSP. Umbilicus can be considered an ideal area for PS formation since it is a depigmented, moist and hairy area. Goodall reported 163 cases

Table 1 Comparison of umbilical pilonidal sinus and control patients data

Factors investigated	Group I Patient group UPS(31)	Group I Patient group Control(100x31)	P value
Age	Mean 24.83	Mean 36.00	Stt 0.001
Sex female/male	4/31	32/100	X ² 0.114
Profession	16/31 student	16/100 student	X ² 0.001
BMI	23.86	26.64	Stt 0.001
Skin color	17 dark skinned, 10 brown, 4 blond, white.	48 dark skinned, 34 brown, 18 blond, white.	X ² 0.935
Hirsute status	15 excessive, 13 normal, 3 inconsiderable.	17 excessive, 9 normal, 74 inconsiderable.	X ² 0.009
Frequency of taking baths	19 (less than twice a week) 12 (over than twice a week)	32 (less than twice a week), 68 (over than twice a week)	X ² 0.062
Personal history of PS	6/31 ps	7/100	X ² 0.155
Familial history of PS	10/31 ps	11/100	X ² 0.030
Wearing tight clothes	23/31	35	X ² 0.001
Using belt	25/31	63/100	X ² 0.221

BMI(body mass index kg/m²)

of pilonidal sinus, of which only one involved umbilicus, which makes an incidence of 0.6% [6]. In this study, results of patient group and those of 31 UPS patients were compared and throughout study period, the prevalence of UPS among all outpatients was found to be 0.1% (Table 1).

Various treatments have been described for UPS. One involves keeping the umbilicus dry in addition to simple extraction of hairs. Aggressive treatment form is surgical intervention [7]. Many treatment forms ranging from protective measures and palliative procedures to radical surgical intervention have been proposed for UPS. Hardaway and Sadghi-Nejad and Rains report treatment by simple extraction of hairs and claim that sinuses are healed [8–10]. We mostly extracted the hair in umbilical sinus tract and had them cleaned with common cleaning solutions. In refractory cases or in case of recurrence, surgical intervention was made umbilectomy.

Among all PS, UPS is an acquired disease and a combination of factors accounts for their formation. A synonym for pilonidal sinus is pilonidal granuloma. The histopathological appearance of the lesion is characteristic of a foreign body granuloma. An epithelial-lined sinus tract leads to an area of fibrosis and granulation tissue surrounding hair shafts. These histopathological findings are similar to those of, sacrococcygeal pilonidal sinus [10].

Contrary to above factors, although SSP occurs more frequently in obese patients, it is uncommon in UPS patients [11]. This may be the result of the flattening of umbilical hole in obese patients, hence decrease in the migration of hair in chest and abdominal area to umbilical hole. In addition, the preference of loose clothes by obese patients may result in a decrease in friction and the amount of hair. The lower incidence of UPS in obese people is attributed to the above factors. As it was not considered possible to standardise the measurement of umbilical depth in patient group, it was not included in evaluation. Deep navel, an important anatomic variation, was quite common in our patients, which indicates a strong correlation with the disease. In our study, BMI was mean 23.8 in UPS patient group whilst it was 26.6 in control group with a statistically significant difference (Table 1). Additionally, inadequate personal hygiene was also noticed in the majority of our patients. In our study number of patients having baths less than twice a week was 19/31 and 32/100 for Group I and II respectively. There was no statistically significant difference between groups ($P=0.06$).

UPS occurs more frequently in young hairy males (mean 22.5) and hence is more common among students [12]. The fact that young males prefer tight clothes may lead UPS to occur more commonly in this age group. In barbers, interdigital PS tends to occur more commonly due to the frequency of hair puncture. The prevalence of UPS among barbers is not known. In the study of Colapinto et al, UPS

was shown only in one patient [13]. In our patient group, no barber was present.

In the study of Goodal et al, UPS was described solely in two female patients [6]. 13.4% of the patients in our study were females, but there was no statistically significant difference between control and patient groups in this respect. (Table 1) In fact, most series of umbilical pilonidal disease consist exclusively of men.

Being hirsute is probably the most important predisposing factor. Nearly all patients (except three patients; $P=0.009$) were hirsute in our study.

In the present study, factors thought to be influential in the development of UPS such as frequency of taking bath, using belt, wearing tight clothes, individual and family history have been evaluated. The relation between wearing tight clothes and family history of UPS and the prevalence of UPS has been found to be statistically significant.

Although the disease had occurred more frequently in those who take less than two baths a week, have individual history and wear belt, the difference was not found to be statistically significant. Wearing belt causes the hairs to be collected at the level of umbilicus and sets the ground for a moist environment, with the hairs piercing the skin. It is also thought that taking bath infrequently allows the hairs to be accumulated in umbilicus, inducing the development of UPS. (Table 1)

Conclusion

In the treatment of UPS, there are various approaches ranging from following the rules of hygienia and medical treatment, to radical surgical interventions in which umbilicus is completely removed. Surgical procedures in which umbilicus is completely removed, may cause cosmetic losses. Furthermore, losing the umbilicus may give rise to psychological misperceptions and make one feel as if he/she has lost connection with the mother, ancestors even humanity. In order to avoid the psychological effects of such procedures, detection of etiological factors of UPS and determination of methods for preventing them will be more useful.

UPS is one of the PS group diseases and involves umbilical region. Clearing off these factors may contribute to the reduction of the prevalence of the disease.

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