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Prospective Study on Development of Perianal Fistula Following Incision and Drainage for Perianal Abscess

*Dr.D.Latha[1], [*]Dr.C.Saravanan[1],Dr.P.Jayakumar[2],Dr.D.Maruthupandian[1],
Dr.K.Karunakaran[2],Dr.S.Thirumalai Kannan[1]
[1]*Department of General Surgery, Madurai Medical College and Government Rajaji Hospital, Madurai, India –625020.*
[2]*Department of General Surgery, Sivagangai Medical College, Sivagangai,India – 630561.*
[*]*Corresponding Author:* [*] Dr.C.Saravanan[1]

Abstract
Background And Objectives: *Perianal abscess is one of the common problems encountered by physicians in clinic or hospital settings. Factors influencing the fistula formation are multifactorial. In this study we try to evaluate the factors influencing fistula formation, particularly plain tap water for sitz bath vs antiseptic solution mixed sitz bath.*
Methodology: *45 cases of perianal abscess visited to Out Patient Department of Govt. Rajaji hospital, Madurai were included into the study. All were underwent Incision and Drainage for the abscess and followed till the wound healing or for 3 months. Patients excluded from the study are Chrons disease, known fistula, multiple abscess patients. Randomly plain tap water sitz bath and antiseptic mixed tap water sitz bath was recommended. Clinical and laboratory parameters were collected on the first visit. Wound evaluated on need basis till the wound heals*
Results: *Total of 45 patients were included in the study, among them 13 patients were females and 32 were males.Among the 45 patients drained for perianal abscess 14 developed perianal fistula and the remaining 31 wound healed without fistula formation.*
Abscess cavity depth of >3cm after drainage associated with fistula formation 42.9%(12) compared to 11.8%(2) in patients with<3cm cavity with significant p value of 0.03.
When >15ml of pus drained associated with fistula formation 52.9%(9) compared to 17.9%(5) in <15 ml pus drained patients with significant p value of 0.01.
Fecal organism in culture associated with 56.5%(13) of fistula formation compared with 4.5%(1) in skin organisms in culture with significant p value of <0.001.
Conclusion: *We conclude that depth of abscess cavity, amount of pus drained and fecal organism in culture increases the chance of fistula formation. Whereas plain tap water for sitz bath redues the chance for fistula formation.*
Keywords: *Perianal Abscess, Perianal Fistula, Sitz Bath, Plain Water*

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I. Introduction

Most accepted theory of perianal abscess formation is cryptoglandular infection and subsequent abscess formation. Perianal Fistula formation following incision and drainage of the perianal abscess is not an uncommon problem. Several factors influences the fistula formation. Younger Age, Antibiotic use following abscess drainage, Fecal organism in abscess and Antiseptic solution mixed sitz bath are associated with increased risk of fistula formation. Immunocompromized states, Skin organism in abscess and Plain tap water for sitz bath are associated with decreased risk of fistula formation[1 - 7]. In this study we try to evaluate the factors influencing fistula formation, particularly plain tap water for sitz bath vs antiseptic solution mixed sitz bath.

II. Materials And Methods

This study was conducted in Department of Surgery, Governmet Rajaji Hospital, Madurai during the year 2014 to 2017. Perianal abscess patients attending or admitted in our hospital were included in the study. All were underwent Incision and Drainage for the abscess and followed till the wound healing or for 6 months. Patients excluded from the study are Chrons disease, known fistula and multiple abscess patients. Randomly plain tap water sitz bath and antiseptic mixed tap water sitz bath was recommended. Clinical and laboratory parameters were collected on the first visit. Wound evaluated on need basis till the wound heals or for the

minimum period of 6 months, patients who fails to attend the clinic before wound healing were interviewed through phone about wound.

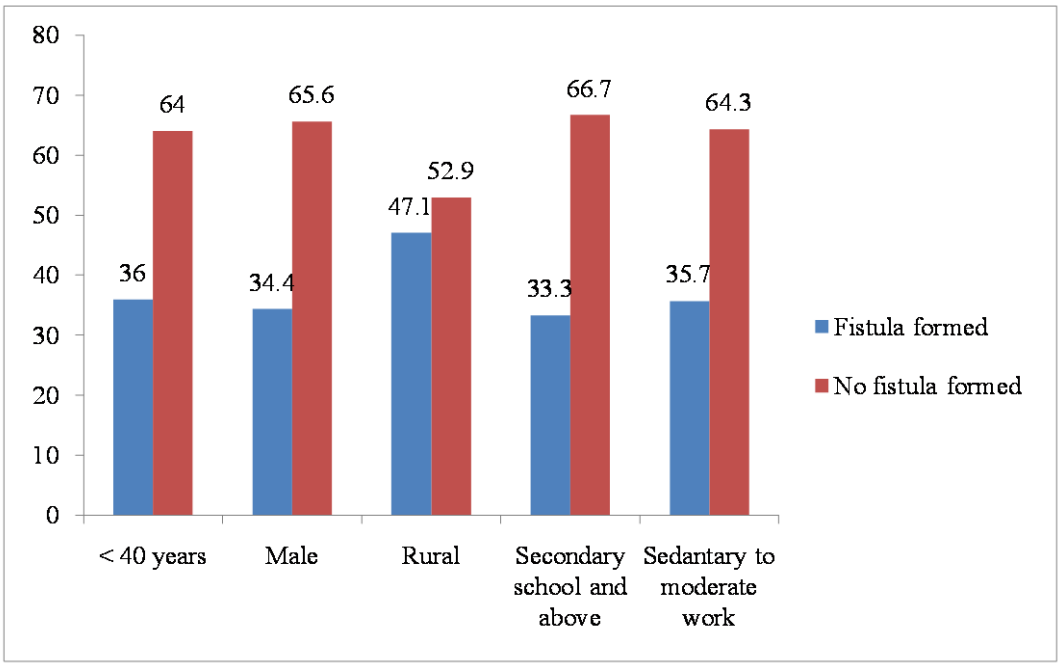
III. Results

Total of 45 patients were included in the study. Among them 13(28.9%) were females and 32(71.1%) were males. Among the 45 patients 25 patients were in group-1 (Plain water sitz bath) and the remaining 20 patients in group-2(Antiseptic solution mixed sitz bath). Out of 25 group-1 patients 19 were males and 6 were females. Out of 20 group-2 patients 13 were males and 7 were females. Among the clients 14 (31.1%)developed perianal fistula and 31(68.9%) didn't develop fistula after 3 months of followup after perianal abscess drainage. In group-1 age < 40 years is 12 and >40 yrs is 13, in group-2 age <40 is13 and > 40yrs is 7. Patients from rural residency is 37.8%, semiurban 33.3% & Urban 28.9%.Among them 10 patients belongs to rural residence and 15 belongs to urban or semiurban residence in group-1. In group-2 , 7 patients belongs to rural residence and the remaining 13 belongs to urban or semiurban residence. Among the study population 8.9% were degree holders, 22.2% done higher secondary schooling, 35.6% were secondary schooling, 28.9% were primary schooling and the remaining 8.9% were uneducated.

Among group-1, 1 patient not done school, 6 were primary schooling, 9 were secondary schooling, 6 were higher secondary schooling and 3 were degree holders. Among group-2, 1 was no schooling, 7 were primary, another 7 were secondary, another 4 were higher secondary schooling and 1 was a degree holder. Occupation wise 68.8% of population were moderate to heavy workers and the remaining 31.1% were sedentary work category. Addiction for tobacco, smoking or alcohol present in 18 participants of group-1 and 9 of group-2 participants. No addictions were found in 7 group-1 and 11 group-2 patients. Co-morbidities like DM, HT or HIV present in 9 group-1 and 2 group-2 patients. No co-morbidities were found in 16 group-1 and 18 group-2 patients. Among the participants sedantary workers were each 7 in group-1 & 2. Moderate to heavy workers were 18 in group-1 and 13 in group-2.

Among the group-1 only 4%(1) developed fistula and the remaining 96%(24) didn't. In group-2 65%(13) developed fistula and the remaining 35%(7) didn't. Fistula formation in age group < 40 years is 36%(9) and in >40 years its only 25%(5), but P value is 0.42 , not significant[Figure.1]. Among the males 34.4%(11) developed fistula compared to 23.1%(3) in females with P value of 0.72, which is insignificant[Figure.1]. Among the rural population 47.1%(8) developed fistula compared to 621.4%(6) in urban population with P value of 0.07 which is insignificant[Figure.1]. Education wise clients with No school & Primary education 26.7%(4) developed fistula compared to 33.3%(10) in secondary and above education with insignificant P value 0.64[Figure.1]. Work wise in sedentary to moderate work category 35.7%(5) developed fistula compared to 29%(9) in heavy work group with insignificant P value of 0.65[Figure.1].

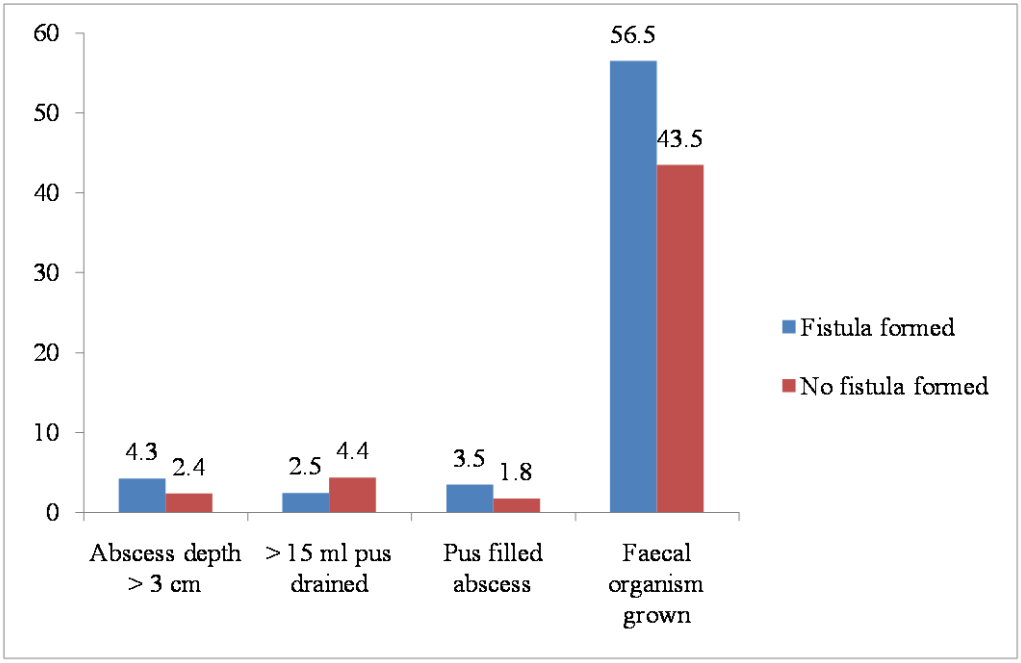
Figure.1



Socio-demographic features of study participants based on the outcome (fistula formation)

Addictions like alcohol, tobocco and smoking patients 33.3%(9) developed fistula compared to 27.8%(5) patients without addictions with insignificant P value of 0.69 . In patients with co-morbitities like DM,HT or HIV patients 27.3%(3) develop fistula compared to 32.4%(11) in without co-morbid patients. Previous history of perianal abscess also not related to fistula formation with insignificant P value of 0.15.

Figure.2



Abscess features of study participants based on the outcome (fistula formation)

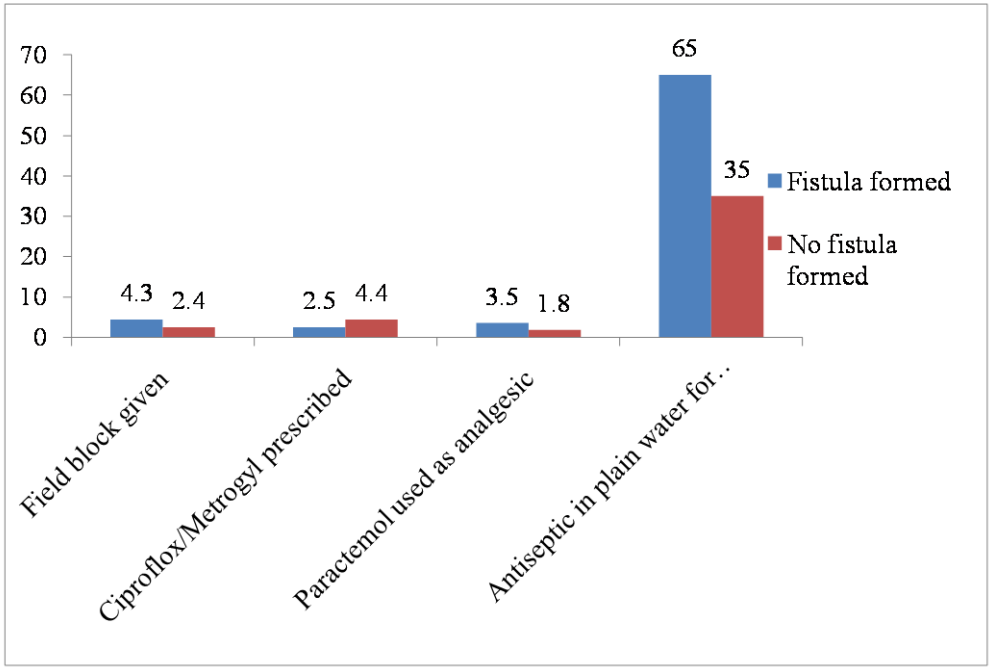
Abscess cavity depth of >3cm after drainage associated with fistula formation 42.9%(12) compared to 11.8%(2) in patients with<3cm cavity with significant p value of 0.03[Figure.2 & Table-1]. When >15ml of pus drained associated with fistula formation 52.9%(9) compared to 17.9%(5) in <15 ml pus drained patients with significant p value of 0.01[Figure.2 & Table-1]. In pus filled abscess cavities 40%(12) develop fistula compared to 13.3%(2) in indurated with pus abscesses with insignificant p value of 0.07[Figure.2 & Table-1]. Fecal organism in culture associated with 56.5%(13) of fistula formation compared with 4.5%(1) in skin organisms in culture with significant p value of <0.001[Figure.2 & Table-1].

Table-1: Association between particulars of abscess and outcome of treatment

Sl. No	Characteristics	Fistula formation after 3 months of follow up		OR (95% CI)	X^2, degrees of freedom	p value#
		Yes N (%)	No N (%)			
1	Depth of abscess after drainage in cm					
	≥ 3 cm	12 (42.9)	16 (57.1)	5.6 (1-29.4)	4.77, 1	0.03*
	< 3 cm	2 (11.8)	15 (88.2)	1		
2	Amount of pus drained in ml					
	> 15 ml	9 (52.9)	8 (47.1)	5.2 (1.3-20.1)	6.07, 1	0.01*
	≤ 15 ml	5 (17.9)	23 (82.1)	1		
3	Consistency of abscess					
	Pus filled	12 (40)	18 (60)	4.3 (0.8-22.7)	3.31, 1	0.07
	Indurated with pus	2 (13.3)	13 (86.7)	1		
4	Organism cultured from the pus drained					
	Faecal organism	13 (56.5)	10 (43.5)	27.3(3.1-238)	14.1, 1	<0.001*
	Skin organism	1 (4.5)	21(95.5)	1		

NOTE: # The p values given here are based on chi-square (X^2) test, * Statistically significant (p <0.05). OR-Odd's ratio (unadjusted)

Figure.3



Treatment features of study participants based on the outcome (fistula formation)

Type of local anesthesia used like local anesthesia or field block does not influence the abscess formation with the insignificant P value of 0.78[Figure.3 & Table-2]. Type of antibiotic prescribed like Doxycycline, Co-trimoxazole, Ciprofloxacin or ciprofloxacin with Metrogyl didn't significantly affect the fistula formation with P value of 0.25[Figure.3 & Table-2]. Type of analgesic drug prescribed like Brufen with paracetamol or paracetamol alone doesn't affect fistula formation with insignificant P value of 0.29[Figure.3 & Table-2]. Type of water used for Sitz bath like plain tap water use associated with less fistula formation 4%(1) compared to 65%(13) in antiseptic mixed tap water with significant P value of <0.001[Figure.3 & Table-2].

Table-2: Association between particulars of treatment given and outcome of treatment

Sl. No	Characteristics	Fistula formation after 3 months of follow up		OR (95% CI)	X^2, degrees of freedom	p value#
		Yes N (%)	No N (%)			
1	Type of local anaesthesia used					
	Local anaesthesia	1 (25)	3 (75)	1	0.07, 1	0.78
	Field block	13 (31.7)	28 (68.3)	1.4 (0.1-14.7)		
2	Type of antibiotic prescribed					
	Cotrimoxazole/Doxy	3 (20)	12 (80)	1	1.29, 1	0.25
	Ciproflox/Metrogyl	11 (36.7)	19 (63.3)	2.3 (0.5-10)		
3	Type of analgesic drug prescribed					
	Paracetamol with Brufen	1 (14.3)	6 (85.7)	1	1.09, 1	0.29
	Paracetamol	13 (34.2)	25 (65.8)	3.1 (0.3-28.7)		
4	Type of water used for Sitz bath					
	Plain water	1 (4)	24 (96)	1	19.2, 1	<0.001*
	With antibiotic	13 (65)	7 (35)	44.5 (4.9-402)		

NOTE: # The p values given here are based on chi-square (X^2) test, * Statistically significant (p <0.05). OR-Odd's ratio (unadjusted)

While comparing means of Age in years, BMI, Hb in gms%, Number of days since the perianal pain, Number of days since the fever, Abscess distance from anal verge, Abscess depth after drainage (cm) and Wound Healed in Days doesn't significantly correlate fistula formation except mean amount of pus drained (ml) was associated with significantly(P=0.05) fistula formation[Table-3]. Mean amount of pus drained is 21.3ml(11%) in fistula formed group compared to 13.4ml(12.5%) in no fistula group with significant P value of 0.05[Table-3].

Table-3: Comparison of other parameters of the study participants for fistula formation

Sl. No	Characteristics in mean standard deviation (SD)	Fistula formation after 3 months of follow up		T value, degrees of freedom	p value#
		Yes	No		
1	Age in years	37.7 (13.2)	38.2 (12.8)	-1.05, 43	0.91
2	BMI	20.7 (3)	22 (2.8)	-1.37, 43	0.17
3	Hb in g%	11 (1.9)	11 (1.7)	-0.11, 43	0.91
4	No of days since the perianal pain	2.9 (0.6)	2.7 (1.2)	0.711. 43	0.48
5	No of days since the fever	1.9 (0.6)	2 (0.8)	-0.15, 43	0.87
6	Abscess distance from anal verge	3.1(0.6)	3.3 (0.9)	-0.75, 43	0.45
7	Abscess depth after drainage (cm)	3.1 (0.6)	2.7 (0.9)	1.71, 43	0.09
8	Amount of pus drained (ml)	21.3 (11)	13.4(12.5)	2.01, 43	0.05*
9	Wound Healed in Days	30.6 (9.9)	25.3 (8.9)	1.79, 43	0.08

NOTE: # The p values given here are based on unpaired t test, * Statistically significant ($p<0.05$).

IV. Discussion

In comparission with Lohsiriwat et al study who reported 31% of fistula formation following incision and drainage, In our study also we found 31% of fistula formation which is same as they reported. But in our population age < 40 years , Diabetic Status and antibiotic administration doesn't affect the incidence of fistula formation as they reported[8]. As Ommer et al reported avoiding cytotoxic antiseptics and using plain tap water results in statistically significant reduction in fistula formation is consistent with our study($P<0.001$)[9]. As reported in other studies fecal organisms in pus culture results in significant chance of fistula formation compared to skin organism in culture.($P<0.001$) In our study we also found that depth of abscess cavity >3 cms associated with increased chance of fistula formation compared to the depth of < 3ml ($P<0.03$) We also found that amount of pus drained >15 ml associated with increased chance of fistula formation compared to pus drained <15 ml ($P<0.01$).

In this study we found that age < 40 years, Gender, Rural or Urban residence, Educational status, Occupation, Substance addictions, Co-morbitities, Previous perianal abscess history, Antibiotic used and Analgesics used didn't influence the fistula in ano formation.

V. Conclusion

We conclude that Depth of abscess cavity, Amount of pus drained and Fecal organism in culture increases the chance of fistula formation. Where as Plain tap water use for sitz bath redues the chance for fistula formation in our population. It needs further studies to confirm the findings of this observation.

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