



A study assessing postoperative Corrugate Rubber drain of perianal abscess



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HIGHLIGHTS

- Management of perianal abscess involves cruciate incision over the abscess and drainage by using Corrugate Rubber drain as another method of drainage and an alternative to other methods like packing by assessing healing of perianal abscess, recurrence and fistula development.
- This study was an observational retrospective review of 137 'case series' of patients with perianal abscess over a fifteen-year period from January 2000 to December 2015. 67 patients in group A were managed by Corrugated Rubber drain and 70 patients in group B were managed by packing.
- In group A, males were 92.53% more than females (7.46%) while group B, males were 85.71% and the rest were females. Outcome measures were assessed; time to cavity healing, pain scoring, abscess recurrence, fistula formation, analgesic requirement and skin disfigurement.
- The mean time of abscess healing in group A and B were 8.50 ± 0.49 and 8.90 ± 0.23 days respectively. Their pain score using Corrugate Rubber drain postoperative were 2/10 in group A while group B was 8/10.
- Most of patients in group A needed mild analgesia (52/67) (77.61%). The rate of abscess recurrence and fistula development were (22/67) (32.83%) and (21/67) (31.34%) respectively in group A which is significantly lower than group B.
- Management of perianal abscess using Corrugate Rubber drain is better than other methods used regarding the outcome measures like pain relief is usually immediate. Bleeding and drainage usually subside within a few days.
- The wounds heal over a matter of a few weeks and low recurrence rate and fistula formation. This resulted in low morbidity and cost.

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ABSTRACT

Background: Perianal abscess which can lead to a devastating complications. The management of perianal abscess involves incision and drainage by different methods one of them is packing the cavity.

Aim of the study: The aim is using Corrugate Rubber drain as an alternative to other methods.

Patients and methods: This study was an observational retrospective review of 137 'case series' of patients with perianal abscess over a fifteen-year period from January 2000 to December 2015. 67 patients in group A were managed by Corrugated Rubber drain and 70 patients in group B were managed by packing. In group A, males were 92.53% more than females (7.46%) while group B, males were 85.71% and the rest were females. Outcome measures were assessed; time to cavity healing, pain scoring, abscess recurrence, fistula formation, analgesic requirement and skin disfigurement.

Results: The mean time of abscess healing in group A and B were 8.50 ± 0.49 and 8.90 ± 0.23 days respectively. Their pain score using Corrugate Rubber drain postoperative were 2/10 in group A while group B was 8/10. Most of patients in group A needed mild analgesia (52/67) (77.61%). The rate of abscess recurrence and fistula development were (22/67) (32.83%) and (21/67) (31.34%) respectively in group A which is significantly lower than group B.

Conclusions: Management of perianal abscess using Corrugate Rubber drain in compares with packing leads to immediate pain relief, low recurrence rate of abscess and fistula formation, without need to expert nursing and less ugly scar formation. This resulted in low morbidity and cost.

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1. Introduction

A perianal abscess is an infection of the soft tissue surrounding the anal canal with collection of pus in the perianal tissues. Pus can

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extend into the ischioanal fossa, on one or both sides, finally form a horse-shoe shaped collection of pus, or track up towards and through the levator ani muscles [1]. The incidence of anorectal abscesses is difficult to accurately access because they are either drain spontaneously or are incised and drained in a physician's clinic, emergency room, or an operating room [2]. Therefore, among 1000 patients with anorectal pathology that presented to the Surgical Section of the Diagnostic Clinic at the University of Virginia, 0.4% of them had anorectal abscesses [3].

The most common aetiology of perianal abscesses arise from the cryptoglandular tissue (proctodeal glands) of the intersphincteric space, the occluded duct of an anal gland with subsequent bacterial overgrowth and later abscess formation that extend between the internal and external sphincter, reach the anal verge to become a perianal abscess [4]. Other causes may be identified such as Crohn's disease, malignancy, AIDS, or other immunosuppressive disorders [5].

Many methods have been proposed for the treatment of an anorectal abscess [6]. The old method is incision of abscess, curettage, instillation of antibiotics and primary closure by suturing advocated in the 1950s by Goligher and Ellis in 1960 [7,8]. This procedure was also adopted by Leaper et al., 1976 and Barnes SM and Milsom 1988 [9,10]. Another alternative method that described by Isbister in 1987 [11] and Kyle and Isbister in 1990 [12] that used de Pezzer catheter with reduced requirement for general anesthesia and nursing. Management of perianal abscess involves an adequate incision or excision of the overlying skin, drainage and packing of the residual cavity by non adhesive alginate dressing allowing wound healing by secondary intention and the prevention of an acute recurrence by preventing the premature closure of the incision [13]. The use of corrugated drain as a method of drainage is not new in perianal abscess but the use is variable depending on abscess location and consultants' surgeons' preference. So, this study aimed to use Corrugate Rubber drain as an alternative method in management perianal abscess compared with packing method by assessing rate of healing, abscess recurrence, and fistula development.

2. Patients and methods

The study consists of 137 patients who presented to different hospitals (Al-Kindy Teaching Hospitals and private Hospitals) in Baghdad with an abscess in the perianal area over a fifteen-year period from January 2000 to December 2015. Their ages were ranged from 20 to 68 years (39.94 ± 0.16). The inclusion criteria were adults aged eighteen years and above who presented with a perianal abscess for the first time, while the exclusion criteria were patients under eighteen years, who had abscess with known fistula, had other forms of interventions like Penrose, Pezzer catheter and curettage, Crohn's disease, immunosuppression, malignancy, diabetes mellitus, pyoderma skin infections and pilonidal abscess. The Scientific and Ethical Committee of Al-Kindy medical college and Hospitals had approved the study. Written informed consents were obtained from the patients with perianal abscesses.

Interference: Patients were categorized in two randomized groups and followed prospectively: Group A consisted of 67 patients all of them treated with incision over the abscess with evacuation of all pus and necrotic material and deep drainage of the abscess cavity was done using an insertion of a piece of corrugated rubber drain (Corrugated Drainage Sheet; Model: GMS-CP, Diameters and size was 25 mm \times 400 mm, supplied by Ghatwary medical supply (GMS)- Borg El-Arab El-Gedida- Egypt/Manufactured by SANICOMP, S.L., Barcelona, Spain). The drain is fixed by a suture of corrugate drain at the end of the wound. Group B consisted of 70 patients all of them were treated with cruciate incision

over the abscess next to the anus under anesthesia (local or general) with evacuation of all pus and necrotic material and packing the abscess cavity. Then a superficial protective dressing was applied to absorb any purulent and bloody discharge from the abscess cavity and protect the open wound. Patients were advised to stand for a long time to allow drainage by gravity, bulk-forming fiber laxatives, keep area clean as possible and manage their own wound until follow-up. Drain was removed after seven days and as soon as there was no purulent discharge.

The outcome measures were time to cavity healing was apparent, cavity being closed and the skin completely re-epithelialised. Pain scoring was achieved via a standard 10-cm Visual Analog Scale for pain administered postoperatively and after two weeks to assess the pain for the whole period of treatment. The pain scoring was: no pain (0–4 mm), mild pain (5–44 mm), moderate pain (45–74 mm) and severe pain (75–100 mm) [14]. Other measures were assessed like abscess recurrence, fistula formation, analgesic requirement (non steroidal anti-inflammatory and paracetamol – based analgesia) during post-operative course and skin disfigurement.

Follow-up: The patients were followed up for a minimum two weeks for abscess completely healing and recurrence in the out patients hospital or private clinics.

2.1. Statistical analysis

Data were presented as mean \pm standard error mean and percentages. Statistical analysis was evaluated using Chi square and Fisher Exact test using MINITAB statistical software 13.20. Inc. Pennsylvania-USA.

3. Results

A total of 137 patients presented with perianal abscess, their ages were ranged from 20 to 68 years (39.94 ± 0.16). Patients were grouped into two groups; Group A consisted of 67 patients managed with incision and drained with corrugate drain. 62 were males (92.53%) and 5 were females (7.46%). Their ages were ranged between 20 and 68 years, median was 39 (Interquartile range (IQR) (14.00)). The second group was group B that involved 70 patients with perianal abscess managed with cruciate incision and drained by packing. Their ages were 21–67 years (median was 38(13.00). Male to female ratio was 60:10.

The most common symptoms included tender swelling, anal pain and fever. The median duration of these symptoms in both groups were four days (Interquartile range (IQR) (5.00)), ranged from 4 to 10 days. The median follow up period of both groups was 20 weeks (Interquartile range (IQR) (92.00)) as shown in Table 1. There was a significant difference ($P = 0.000$) between males and females.

The most common location of perianal abscess of the patients was posterior to anus in both groups (36 cases) (53.73%) in group A and (41 patients, 58.57%) in group B. There is no significant difference in abscess location between two groups. Regarding the most common site of fistula formation after follow-up was left lateral (9 cases) (42.85%) in group A and 13 cases (38.23%) in group B as demonstrated in Table 2.

The outcome measures of management of perianal abscess using Corrugate Rubber drain compared with group B that was managed by packing was shown in Table 3. There is a significant difference between two groups regarding pain score, abscess recurrence rate, fistula formation, used of analgesia and ugly scar formation. Group A pain score in the immediate postoperative period and two weeks after surgery were 2/10 and 1/10 respectively while group B, median score pain after operation was 8.00

Table 1
Patients' demographic data.

Demographic data	Patients with perianal abscess managed by rubber corrugate drain No. = 67	Patients with perianal abscess managed by packing No. = 70	P -value
Median age	39(14.00)	38(13.00)	0.397
Sex (Male/female)	62:5	60:10	0.000
Male %	92.53%	85.71%	
Female %	7.46%	14.28%	
Median duration of symptoms (days)	4(5.00)	4(5.00)	1.00
Median duration of follow-up (weeks)	20(92.00)	20(92.00)	1.00

* Interquartile range (IQR) expressed within parentheses.

Table 2
Locations of perianal abscesses and fistula formed later on after management.

Locations	Patients with perianal abscess managed by rubber corrugate drain No. = 67 No. %	* Fistula formation Later on after management with rubber corrugate drain No. = 21 No. %	Patients with perianal abscess managed by packing No. = 70 No. %	* Fistula formation later on after management with packing No. = 34 No. %
Anterior	00.00 00.00	00.00 00.00	00.00 00.00	00.00 00.00
Left lateral	13.00 19.40	09.00 42.85	14 20.00	13 38.23
Right lateral	17.00 25.37	07.00 33.33	15 21.42	11 32.35
Posterior	36.00 53.73	05.00 23.80	41 58.57	10 29.41
Horseshoe	01.00 01.49	00.00 00.00	00.00 00.00	00.00 00.00
Total	67.00	21.00	70.00	34.00

* P = 0.895 (not significant).

Table 3
The outcome measures after incision of perianal abscess and managed using Corrugate Rubber drain compared with management with packing.

Outcome measures	Patients with perianal abscess managed by rubber corrugate drain No. = 67 X±SEM	Patients with perianal abscess managed by packing No. = 70 X±SEM	P- value
1- Mean time of abscess cavity healing (days) (X±SEM) Range (days)	8.50 ± 0.49 (4–16)	8.90 ± 0.23 (4–17)	0.445
2- Median postoperative Pain score (/10)	2.00 ^a (1.00)	8.00 ^a (2.00)	0.012
3- Median two weeks postoperative Pain score (/10)	1.00 ^a (1.00)	1.00 ^a (1.00)	1.00
4- Percentage recurrence rate of perianal abscess post operative	22/67 32.83	35/70 50.00	0.041
5- Percentage abscess resolved without postoperative complications	45/67 67.16	36/70 51.42	0.089
6- Percentage of fistula development post operative	21/67 31.34	34/70 48.57	0.039
7- Requirement for analgesia post operative	52/67 77.61	70/70 100	0.000
8- Development ugly scar postoperative	00.00 00.00	40/70 57.14	0.000

^a Interquartile range (IQR) expressed within parentheses.

(P = 0.012). Most of patients in group A (52/67) (77.61%) need mild analgesia like Non Steroidal anti inflammatory drugs (mefenamic acid) and Paracetamol derivative (Panadol Extra) while all patients in group B need strong analgesia 70/70 (P = 0.000). **Table 3** showed the post operative complication like abscess recurrence and fistula development were (22/67) (32.83%) and (21/67) (31.34%) respectively in group A which is significantly differ (P = 0.041) and (P = 0.039) from group B (35/70) (50.00%) and (34/70) (48.57%) respectively.

There is no significant difference in other respects between two groups regarding the time of abscess cavity healing was 8.50 ± 0.49 days ranging from (4–16) days while in group B was also 8.9 ± 0.23 (4–17 days). About 45/67 of patients (67.16%) their abscess resolve without any sequel or complications develop during their follow-up period (median 20 weeks) (IQR) (92.00) ranging from (2–144 weeks) which compares to 36/70 (51.42%) of group B patients (P = 0.089). About 57.14% of patients in group B developed ugly scar after healing which was significantly higher (P = 0.000) than group A who were managed by corrugate drain.

4. Discussion

Management of patients with perianal abscess who do not have

a history of Crohn's disease, malignancy, HIV and immunosuppression is surgical incision and drainage [15]. The incision was performed as close to the anus as possible to shorten the length of any possible subsequent fistula tract.

Drains are used both prophylactically after surgery to prevent accumulation of pus in the cavity after surgery and therapeutically. It can be divided into passive or active drains. Active drains use negative pressure while passive drains depends on higher pressure inside the cavity [16]. The drainage of the abscess can be achieved by many methods like packing, Penrose drain, curettage, 10F–16F Pezzer soft latex mushroom catheter, placing loose seton and non packing method of cavity.

In our study Corrugate Rubber drains used in group A and packing in group B. In group A rubber causes a tissue reaction and the drain track caused by this material persists longer than when inert materials are used. Group A, their pain score after incision and drainage using Corrugate Rubber drain postoperative and two weeks after operation were 2/10 and 1/10 respectively which is significant lower than group B. Group A did not need analgesia in comparison with group B who all of them were need analgesia. For most patients the mean time of abscess cavity healing was 8.50 ± 0.49 days ranging from (4–16) days. About 45/67 of patients (67.16%) their abscess resolve without any sequel or complications

Table 4
Results of the outcome measures of other studies.

Types of managements	Rate of abscess recurrence %	Rate of fistula formation %	year	References
Penrose drain	44	57.5	1997	Cox et al. [17]
10F–16F soft latex catheter	26	26	1988	Beck et al. [20]
Incision + evacuation	37	50	1987	Fazio et al. [23]
Packing	37.5	–	2015	Perera et al. [25]
Non packing	33.3	–	2015	Perera et al. [25]
Incision + drainage	11	37	1984	Vasilevsky and Gordon [26]
	10	37	1998	Hamalainen and Sainio [27]
Incision + drainage + primary suture	15	7	1964	Wilson [28]
	20	20	1973	Buchan and Grace [29]
	17	17	1995	Mortensen et al. [30]
Incision + drainage + Seton	3	3	1993	Pearl et al. [31]
	12.5	12.5	1997	Cox et al. [17]
Incision + drainage + unroofing	18.6	15.1	1973	Buchan and Grace [29]
	3.7	3.7	1984	Ramanujam et al. [32]
	26	26	1986	Henrichsen and Christiansen [33]
	5.6	11.1	1987	Hebjorn et al. [34]
	3	3	1993	Pearl et al. [31]
	13	8.7	2004	Tonkin et al. [35]

develop during their follow-up period (median 20 weeks) (IQR) (92.00) ranging from (2–144 weeks). In addition to that, the post operative complication like abscess recurrence and fistula development were (22/67) (32.83%) and (21/67) (31.34%) respectively in group A which is significantly lower than ($P = 0.041$) ($P = 0.039$) group B (35/70) (50.00%) and (34/70) (48.57%) respectively. Therefore, Corrugate Rubber drain is a type of open passive drain that collects pus or fluid in gauze pad and drain by means of pressure differentials, overflow and gravity between abscess cavity and the exterior. The advantages of Corrugate Rubber drain in group A is cheap, rubber induce an intense tissue reaction allowing a tract to form, allow evaluation of volume and nature of fluid, prevent bacterial ascension, eliminate dead space, help appose skin to wound bed (quick wound healing), less pain, less recurrence abscess formation, less fistula formation and less ugly scar in contrast to group B that used packing.

When comparing our results with other study using Penrose drain as another method of drainage, the abscess recurrence rate was 44% [17] which is higher than our study. This may be due to differences in the patients' population in this study, selection criteria of the patients, demographics of the patients and immune status of them. Other study demonstrated that large abscess and horseshoe abscesses is treated by many incisions, leaving the intervening skin intact and encircling it with a Penrose drain sutured onto itself to avoid premature extrusion and delay the healing of superficial tissues allowing the abscess to fill in and close from the depth [18]. Using other process of drainage like curettage and suture for drainage of the abscess lead to recurrence of abscess more frequently which differs from our results, but the time to healing of initial and recurrent abscesses and fistulas in the three-year follow-up period was less after suture than after incision alone [19]. A different method of management is catheter drainage. Beck et al., 1988 [20], treated 31 patients by using 10F–16F soft latex mushroom catheter into the abscess cavity and found that 26% of the patients had abscess recurrence and 26% developed fistula. The differences in abscess recurrence and fistula formation with our study were due to long duration of follow-up period while the above study was for short duration of follow-up. The catheter should be removed when the cavity has closed around the catheter and the drainage has ceased [21].

In addition to adequate drainage of abscess cavity, one should attempt to prevent acute recurrence of an abscess by excising the overlying skin and packing [22]. Abcarian, 2011 [18] demonstrated

that packing is not recommended due to cost and severe pain inflicted on the patient which is in agreement with our study; 100% of the group B patients need analgesia while in group A 77.61% of the patients need mild analgesia like NSAD and Paracetamol and the rest did not require any analgesia. The drawback of post-operative packing is costly dressing, time consuming, deepen cavity and also obstruct normal drainage [18]. This is in agreement with our study, patients in group B could not dressed by their relatives and they need contact expert dressers in nearby hospitals which is costly while group A who managed with corrugate drain; they were dressed by their relative without the need expert dressers.

Other method of treatment abscess is only incision and evacuation of the cavity without drainage and the recurrent rate of abscesses and anal fistula may develop in 37% and 50% of patients respectively [23, 24]. Perera et al., 2015 [25] suggested that not packing the perianal abscess cavity after incision and drainage is safe and confers less pain (median (IQR) 2.00 (3.00) vs 0.00(1.00); ($P = 0.030$) with a faster healing time mean 26.8 days (95% confidence interval 22.7 to 30.7) vs 19.5 days (13.6–25.4); $P = 0.047$ compared with the conventional packing method. Our study that used Corrugate Rubber drain in group A showed faster healing time which is 8.50 ± 0.49 days and less pain score (2.00–1.00). A more systemic comparison with other existing literatures demonstrated in the following Table 4:

Other study found that acute abscess recurrences occur in 11%, and development of chronic fistula-in-ano occurs in up to 37% of patients [26]. Recurrences occur due to insufficient drainage [36], failure to break up all loculation within abscess, missed abscess and undiagnosed fistula [37]. In addition to that, packing leads to ugly scar after healing in 57.14% of patients.

5. Conclusions

Management of perianal abscess using Corrugate Rubber drain in compares with packing leads to immediate pain relief, wounds healing over a matter of a few weeks and low recurrence rate of abscess and fistula formation and without need to expert dressers and less ugly scar formation. This resulted in low morbidity and cost.

Ethical approval

yes.

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Author contribution

Dr Riyadh contributed in doing surgery, study concept or design, data collection, data analysis or interpretation, writing the paper, others.

Conflict of interest

Author declared no conflict of interest.

Guarantor

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