

Original article:

Prospective study of use of drains in abdominal surgery in rural area

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Abstract:

Introduction: An appliance or piece of material that acts as a channel for escape (exit) of gases, fluids and other material from a cavity, wound, infected area or focus of suppuration. It is an important adjunct in a variety of surgical procedures.

Surgical drains of various types have been used, with the best intentions, in different operations for many years.

Materials and methods: The patients admitted in the surgical ward of pravara rural hospital from 1st september 2015 to 31st August 2017 we're included for the study. 60 patients were included for the surgery. All elective and emergency cases admitted and undergone abdominal surgery in whom drains were used were included in the study. The consent of all the patients included in the study were taken.

Results: In this study, 14 patients were included. Patients included incisional hernia and paraumbilical hernia, for which they underwent meshplasty and anatomical repair respectively. In all these patients Romovac suction drain was used of sizes no.14/16. None of the Patients were diabetic. 1 patient was hypertensive which was adequately controlled. Drain was inserted in the subcutaneous plane through a separate stab incision away from the primary incision.

Conclusion: Drains are also helpful in avoiding life threatening complications, such as intraabdominal collection (pus), Peritonitis etc. In spite of all the data there is a need for further evaluation on this topic.

INTRODUCTION

An appliance or piece of material that acts as a channel for escape (exit) of gases, fluids and other material from a cavity, wound, infected area or focus of suppuration. It is an important adjunct in a variety of surgical procedures.

Surgical drains of various types have been used, with the best intentions, in different operations for many years. [1] It is often open to question whether they achieve their intended purpose despite many years of surgery. There is a paucity of evidence for the benefit of many types of surgical drainage and many surgeons still 'follow their usual practice'. With better evidence, management of surgical patients should improve and surgeons should be able to practice

based upon sound scientific principles rather than simply 'doing what I always do. [2]

Criteria for selection of drains are Contamination of serous cavities, Dead Space, Leakage, Oozing, Dependency The study comprises of type and material of drain to be used, Daily measurement of drainage, Indication to remove drain, Postoperative day on which drain is removed, Morbidity associated with drains and complications, if any, due to drain. Various types of drains used are [3] Tube drain, Corrugated rubber drain, Penrose drain, Closed suction drain, Sump drain.

AIMS AND OBJECTIVES:

1) To evaluate the efficiency of drains as routine practice in abdominal surgery.

2) To study different types of drains used in abdominal surgery.

3) To study advantages and disadvantages of drains in abdominal surgery.

4) To study complications of drains in abdominal surgery.

MATERIALS AND METHODS

The patients admitted in the surgical ward of pravara rural hospital from 1st september 2015 to 31st August 2017 were included for the study. 60 patients were included for the surgery. All elective and emergency cases admitted and undergone abdominal surgery in whom drains were used were included in the study. The consent of all the patients included in the study were taken. All patients not giving consent were excluded from the study. Patients were of both sexes and all ages were included. In this study Tube drain of various sizes from 28-32 for laparotomy, Romovac suction drain for incisional and umbilical hernia repair, Foleys catheter of size 12 and 14 for suprapubic cystolithotomy and Corrugated drain for secondary suturing were used. Patients were routinely enquired about the complaints related to drain. All the complications encountered during immediate and late post operative period related to drain were followed up and noted. Number of patients and method of study for each group:

1) Tube drain: 31 patients undergoing exploratory laparotomy for gastrointestinal pathologies were included for the study. Tube drains were inserted. Two drains were inserted in all the patients, one in Morrison's pouch (MP) and second in Pelvic cavity (PD). Tube drains of size 28-32 were used.

2) Romovac suction drain: 14 cases of incisional hernia and paraumbilical hernia for which meshplasty and anatomical repair was done respectively, were

included for the study. Single drain was inserted of size no.14/ 16 through a separate stab incision in the skin.

3) Foley's catheter: 10 cases of vesical calculi were included for the study. Foleys catheter of size 12/ 14fr were used as a drain for suprapubic drainage through a separate skin incision away from primary suture line.

4) Corrugated drain: 5 cases of wound gape were included for the study. Corrugated drain was used for secondary suturing and brought out through a separate skin incision. Wound gape were of post laparotomy midline incision.

OBSERVATIONS AND RESULTS:

In the study a total of 60 patients were included. In 31 cases Tube drains were to study a suction drain was used, in 10 cases Foley's catheter was used as retropubic drain and in 5 cases corrugated drain was used.

A. TUBE DRAIN

RESULTS:

In this study 31 patients who had undergone surgeries for gastrointestinal pathologies were included. 2 patients were diabetic and 5 patients were hypertensive which were adequately controlled. Two tube Drains were used in all the 31 patients. One in Morrison's pouch (MP) and other in pelvic cavity (PD).

Average amount of drainage volume in Morrison's drain was 130cc and 150 cc in the pelvic drain in the first 24 hrs. Drainage fluid volume reduced subsequently with a minimum drainage volume in Morrison's drain on POD 5 (approx. 10 cc) and pelvic drain on POD 7 (approx.<20cc)

ON THE DAY OF DRAIN REMOVAL

Out of 31 patients, in 25.8% of cases morrison's drain was removed on POD 5, 54.83% on POD 6, 16.12% on POD 7, 3.22% on POD 8.

In 38.7% of the cases pelvic drain was removed on POD 7, 51.61% on POD 8, 6.45% on POD 9, 3.22% on POD 10.

SOAKAGE AT THE DRAIN SITE AFTER REMOVAL OF DRAIN

Soakage (mostly serous) was observed at drain site upto 2-5 days after drain removal, In 35.48% of cases soakage was observed upto 2 days at morrison's drain site and 41.93% at pelvic drain site, in 51.61% cases was observed upto day 3 at morrison's drain site and 48.38% at pelvic drain site, 12.90% cases had soakage from morrison's drain site upto 5 days and 3.22% from the pelvic drain site, 3.22% from the pelvic drain site at day 6 after drain removal.

All the patients required analgesics for pain at drain site and 22.58% of patients difficulty in ambulation with the drains in situ. 12.90% of patients had bulky dressing 9.67% of patients had soiling at drain site, 12.90% of patients had irritation of surrounding skin of drain site. 6.45% of cases had delayed healing at drain site and 22.58% of cases developed an ugly scar at drain site.

Nearly all the patients were ambulated on POD-1(90.08%), and rest on POD-2 (6.45%)and POD - 3 (3.22). Majority of the patients(61.29%) had a postoperative hospital stay of 14 days. 29.03% of patients had a stay of upto 16 days, rest had a postoperative hospital stay of 18 days(6.45%) and 20 day5(3.22%).

There were complications related to primary pathology/main wound, 4 patients developed serous collection in main wound which was aspirated and it gradually reduced and healed over time without any complications. 2 patients developed abscess in wound

with pus discharge for which sutures had to be removed to drain the pus, which subsequently resulted in wound dehiscence. 51.61% of patients developed post-operative fever on POD1 which gradually subsided by POD 3 for a majority of patients but 2 patients continued to have fever upto PODS which subsided by POD 7. 2 patients developed sub-hepatic collection which was aspirated USG guided without any complication (not related to drain) none of the patients developed peritonitis postoperatively or any other intraabdominal complications .

In 50% of patients there was requirement of analgesics for pain at drain site, for which IV analgesics were given and subsequently shifted to oral analgesics.

1 patient had soiling at drain site with irritation of surrounding skin, for same Patient bulky dressing had to be done. Patient had delayed healing with development of ugly scar at drain site. There was no difficulty in ambulation of the patients.

In this study, 14 patients were included. Patients included incisional hernia and paraumbilical hernia, for which they underwent meshplasty and anatomical repair respectively. In all these patients Romovac suction drain was used of sizes no.14/16. None of the Patients were diabetic. 1 patient was hypertensive which was adequately controlled. Dram was inserted in the subcutaneous plane through a separate stab incision away from the primary incision.

The average amount of drainage volume was 50cc on POD1, 30cc on POD2, 20cc on POD3, 10cc on POD4 and minimal thereafter.

POD OF DRAIN REMOVAL

In 2 cases drain was removed on POD 3.

In 42.85% of cases drain was removed on POD 5

In 42.85% of cases drain was removed on POD6.

SOAKAGE AT THE DRAIN SITE AFTER REMOVAL OF DRAIN

In 85.71% patients there was minimal soakage(1-2 gauze serous) from drain site upto 2 days, in 7.14%

of (1)patient soakage upto 3 days and in 7.14% of (1)patient,soakage upto 4 days was observed after removal of drain which was serous and drain was removed on POD3.

Table 1: POST-OPERATIVE DRAINAGE VOLUME OF TUBE DRAIN

POST-OPERATIVE DAY	AVERAGE DRAINAGE VOLUME(ML) IN DRAIN IN MP	AVERAGE DRAINAGE VOLUME(ML) IN DRAIN IN PELVIS(PD)
1 ST	130	150
2 ND	100	110
3 RD	60	80
4 TH	30	70
5 TH	10	40
6 TH	Minimum	25
7 TH	Minimum	<20
8 TH	Minimum	<10
9 TH	-	Minimum

TABLE 2. POST-OPERATIVE EVENTS

Sr. no	Post-operative events	No of patients(n=31)
1)	Post-op day of ambulation	
	a. 1 st	28
	b. 2 nd	2
	c. 3 rd	1
2)	Post operative fever	16
3)	Collection in main wound	
	a. Serous	4
	b. Hematoma	0
	c. Pus	2
4)	Injectable analgesic for pain	31
5)	Post op hospital stay(No pf days)	No of patients(n=31)
	a. 14	19
	b. 16	9
	c. 18	2
	d. 20	1

6)	Fistula	0
7)	Peritonitis	0
8)	Wound dehiscence	2

TABLE 3 : SOAKAGE AT THE DRAIN SITE AFTER REMOVAL OF CORRUGATED DRAIN

No of days	No of patients
2	3
3	1
4	1

TABLE 4 . POST-OPERATIVE EVENTS OF CORRUGATED DRAIN

Sr no	Post-operative events	No of patients
1)	Post-op day of ambulation	1
2)	Fever	1
3)	Collection in main wound	
	a. Serous	3
	b. Hematoma	0
	c. Pus	2
4)	Injectable analgesia	2
5)	Any other complication	
	a. Wound dehiscence	0
6)	Post-op hospital stay(no of days)	
	a. 12	3
	b. 13	2

TABLE 5: POST OPERATIVE EVENTS OF FOLEY'S CATHETER

Sr no	Post-operative events	No of patients(n=10)
1)	Post-op day of ambulation	All on POD 1
2)	Fever	2
3)	Collection in main wound	
	a. Serous	1
	b. Hematoma	0
	c. Pus	0
4)	Injectable analgesia	10
5)	Post-op hospital stay(no of days)	
	a. 9	1

	b. 10	5
	c. 11	3
	d. 15	1

TABLE 6 . POST OPERATIVE EVENTS OF ROMOVAC SUCTION DRAIN.

Sr no	Post-operative events	No of patients(n=14)
1)	Post-op day of ambulation	1 st day of post op for all patients
2)	Fever	2
3)	Collection in main wound	
	a. Serous	12
	b. Hematoma	2
	c. Pus	0
4)	Injectable analgesia	5
5)	Post-op hospital stay(no of days)	
	a. 8	10
	b. 10	2
	c. 12	1
	d. 14	1

RESULTS

- 1) In 35.71% of patients required analgesics for pain.
- 2) In 14.28% of patients had soiling of drain site and irritation of surrounding skin which required bulky dressing.
- 3) 28% patients developed fever in the post operative period.
- 4) 14.28% of patients developed delayed healing at drain site and ugly scar at drain site.

None of the patients developed wound dehiscence, abscess or any other complication related to main wound. As in 85.71% of patients the drains were removed after POD5 and thereafter there was no evidence of any collection seen in the main wound after removal of drains. In 7.14% of patient where drain was removed on POD3 there was soakage up to 4 days which gradually resolved. Drains are not a substitute for good surgical technique. [13] The

choice of type and number of drains to be used in the surgery depends upon the operating surgeon.

DISCUSSION

Drainage of body cavities has been practiced in medicine for a long time. Prophylactic drains have been employed to remove intraperitoneal collections such as ascites, blood, bile, chyle, and pancreatic or intestinal juice.

A study conducted by Savio G Barreto, et al [4] in Department of hepatopancreato-Biliary Surgical Oncology, Tata Memorial Hospital, Mumbai, Maharashtra, India, concluded that: The insertion of drains did aid in the detection of complications following gastric and pancreatic surgery. Two drains offer no further advantage over one drain in terms of detection of complications. While the number of drains did not contribute to, or reduce, the morbidity and mortality in the two groups, the use of one drain

significantly reduced hospital stay. Taken together, these findings support the prophylactic insertion of a single intra-abdominal drain following gastric and pancreatic resections.

In our study of 31 cases which included laparotomies for gastrointestinal pathologies in which tube drains were used, an average draining volume of 130cc in MP and 150cc in PD were seen on POD1, which gradually reduced. In 25.8% of cases morrison's drain was removed on POD5, 54.83% on POD6, 16.12% on POD7, 3.22% on POD 8. In 38.7% Of the cases pelvic drain was removed on POD 7, 51.61% on POD 8, 6.45% On POD9, 3.22% on POD 10.

All the patients required analgesics for pain at drain site and 22.48% of patients faced difficulty in ambulation in the initial days post-operative with the drains in situ. Nearly 12.90% of patients had bulky dressing 9.67% of patients had soiling at drain site, 12.90% of patients had irritation of surrounding skin of drain Site. 6.45% of cases had delayed healing at drain site and 22.58% of cases developed an ugly scar at drain site.

90.08% of patients were ambulated on POD-1 and 6.45% on POD-2 and 3.22% on POD3. 61.29% of the patients had a postoperative hospital stay of 14 days.

Abdominal drainage following major gastrointestinal surgery has often been a matter of contention.[5,6,7] The debated issues are whether to drain or not[6,7] or whether to remove the intraoperatively inserted drain early or late, and the implications of this.[5,8]

Corrugated drains are a type of passive drains, they are used in the drainage of residual pus or inflammatory fluid, residual hemorrhage or clots etc. In our study which included five patients had a wound gape for a midline laparotomy incision, were taken up for secondary suturing and corrugated

rubber drain was inserted. It was found out that there was drainage from the drain of upto 3-4 gauze on POD1 in all the patients which gradually reduced. Drains were shortened daily and drains were removed on POD3 in 80% of cases and rest on POD4. There was no evidence of any collection in the main wound. Disadvantages of corrugated drain were

- 1) All the pain complained of pain and discomfort around the drain site which required analgesics.
- 2) There was irritation of the surrounding skin and soiling at the drain site.

In our study which included 10 cases of vesical calculi, for which open suprapubic cystolithotomy was performed. We used Foleys catheter of Size 12/14 for the draining of retropubic space. Foleys catheter is used primarily to drain per urethral. The average dram in the retropubic space was around 60cc serous on POD1 which gradual reduced. Drain was removed after 24 to 48hrs of removal of perurethral Foleys catheter after checking of any leak etc. There was minimal soilage for 1 day after removal of drain. In our study we observed that pain at drain Site was significantly less in p cuts, only one patient complained of pain. Hence foley's catheter can be effectively used as a retropubic drain with minimal drain related complications.

In this study a total of 14 case of incisions! hernia and paraumbilical hernia were included. A negative suction drain was used for this study. Drains are used both Prophylactically and therapeutically. The most common use is prophylactic after surgery to prevent the accumulation of fluid(eg- blood, pus) or air.

Surgical drains are commonly used after surgical procedures in the thyroid[9], breast[10] and axillary area as well as after abdominal procedures and joint replacements.[11,12]

In our study there was an average draining volume of < 50cc (serous) on POD1 in the drain in all the cases. We observed that there was collection in the drain upto POD5, which gradually reduced thereafter. In 42.85% of cases drain was removed after POD5, and in 42.85% cases drain was removed on POD6. In 85.71% cases there was minimal soakage (less than 1

gauze) from the drain site upto 2 days which spontaneously healed without any complications.

CONCLUSION

Drains are also helpful in avoiding life threatening complications, such as intraabdominal collection (pus), Peritonitis etc. In spite of all the data there is a need for further evaluation on this topic.

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