Comparison of Suction Drain and Corrugated Drain after Hydrocele Surgery

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Abstract:

Background: Corrugated drain is conventionally used after hydrocele surgery to prevent hematoma formation. However, it may not prevent hematoma, may result in retrograde infection and requires frequent change of dressings.

Objective: To prove the hypothesis that close system suction drain will avoid these problems.

Patients and methods: Fifty patients with 60 hydroceles (10 patients had bilateral hydroceles) were operated by Jaboulay procedure. They were randomized into study group (suction drain; n = 31) and control group (corrugated drain; n = 29 patients). Outcome measures included hematoma, seroma, surgical site infection, frequency of change of dressings and Visual Analogue Score for pain.

Results: Incidence of hematoma, seroma, surgical site infection and Visual Analogue Score was similar in both groups. However; dressing change was not required in the study group.

Conclusion: Suction and corrugated drains are equally effective following hydrocele surgery, but suction drain has the advantage of no dressing change.

Keywords: Hydrocele, Surgery, Complications, Corrugated drain, Suction drain

Introduction

Surgery is the treatment of choice for primary hydrocele, which is estimated to affect 1% of adult men.[1] Hydrocele surgery is often associated with complications such as infection, hematoma or seroma. The most common complication after hydrocele surgery is scrotal hematoma which occurs in about 9% of cases.[2,3] Complications after surgery for hydrocele may lead to prolonged hospitalization and additional morbidity for the patient. A corrugated drain is conventionally put in at the most dependent

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part of scrotum to reduce the chance of post-operative hematoma. But it may be associated with more pain and retrograde infection and requires frequent change of dressings. Therefore, we hypothesized that using close suction drain will avoid/minimize these problems and studied its efficacy to prevent complications after hydrocele surgery.

Material and methods

This prospective interventional study was conducted in a tertiary hospital in Central India over a period of 1 year (January 2021-December 2021). Local ethics committee approval and written/informed consent from patients were taken.

Based on our own experience and literature review,[3,4] we assumed that 25% of the subjects in the corrugated group would experience complication. As there was no report on closed suction drain, we hypothesized that 1% of subjects in this group would experience complications. After applying continuity correction, a sample size of 30 in each arm was calculated *a priori* to achieve a power of 80% and a level of significance of 5%.

Fifty patients (60 primary hydroceles) with age ranged from 17-80 years (mean 43.72 years) were included. Patients with small hydrocele, secondary hydrocele, congenital hydrocele, recurrent hydrocele, pyocele, filarial scrotum and patients not willing to participate in the study were excluded.

Sizes of the hydroceles were graded as suggested by Capuano et al.[5]

- *Stage I*: The size of the scrotum is less than that of a tennis ball.
- *Stage II*: The size of the scrotum is greater than that of a tennis ball.
- *Stage III*: The lower pole of the scrotum goes down to mid-thigh.
- *Stage IV*: The lower pole of the scrotum reaches the area between the upper edge of the patella.
- *Stage V*: The lower pole of the scrotum reaches the area between the lower edge of the knee and mid-leg.
- *Stage VI*: The lower pole of the scrotum reaches the area between mid-leg and the ankle.

All patients were operated using Jaboulay procedure and at the end of surgery study group patients had suction drain (Romovac, Johnson & Johnson Pvt. Ltd. 501 Arena Space, Jogeshwari (E) Mumbai India 400060) (study group) and control group patients had corrugated drain (Johnson & Johnson Pvt. Ltd. 501 Arena Space, Jogeshwari (E) Mumbai India 400060) [Figure 1]. Alternate patients were drained by suction and corrugated drains, and in cases of bilateral hydroceles one side was drained by suction and the other by corrugated drain. Scrotal support dressing was applied at the end of the procedure.

Outcome measures included hematoma (defined as post-operative swelling of scrotum with skin discoloration and oozing of blood through the incision site), seroma (serous collection), surgical site infection (sero-purulent discharge from the incision site with edema, redness and tenderness), frequency of change of dressings and Visual Analogue Score (VAS) for pain. Drains were removed when drainage stopped, usually on the 2nd or 3rd postoperative day. All patients were advised scrotal support for 6 weeks at the time of discharge.

Results

Total 78 hydrocele patients underwent surgery during the study period, 18/78 were Capuano Grade I size and underwent Lord's operation without drainage and were excluded from the study.[6]

Figure 1 Showing the two types of drain, suction drain on the left and corrugated drain on the right side

Table 1 Comparison between two types of drain in hydrocele

Parameters	Study group (Suction drain, n = 3)	Control group (Corrugated drain, n = 2)	P value
Hematoma	1	2	0.60
Seroma	3	2	1.00
Surgical site infection	2	1	1.00
VAS score (Mean ± SD)	3.0 ± 2.44	3.8 ± 2.04	2.88
Change of dressing	No dressing required	Average 3 dressings needed	

Twenty-two patients had right, 18 had left and 10 had bilateral hydrocele. These underwent Jaboulay procedure and constituted material for our study. 31 patients had suction drain (study group; stage II 4 cases and stage III 27 cases) and 29 patients had corrugated drain (control group; stage II 5 cases and stage III 24 cases). Volume of drainage in the suction group ranged from 30-50 mL (mean volume 45 mL). Incidence of hematoma, seroma, surgical site infection and VAS score was similar (statistically insignificant) in both the groups (Table 1). Hospital stay for both groups of patients was same (3 days). Patients in the suction drain group required no change of dressing and the dressing applied in operation theatre was removed on the 3rd postoperative day while in corrugated drain group postoperatively average 3 dressings were required for all the patients.

Discussion

Hematoma formation is common after hydrocele surgery as there is little tamponade capability and even capillary oozing can result in a hematoma.[7] In addition to an increased risk for infection a hematoma can lead to prolonged convalescence with marked discomfort.

Various types of preventive pressure dressings have been devised to prevent hematoma.[8-11] However, none of these dressings provide effective constant compression to prevent hematoma formation, do not produce scrotal elevation, are cumbersome and often get dislodged. The primary source of bleeding in scrotal surgery is either the Dartos fascia or the cut edge of the hydrocele sac; and even with meticulous hemostasis, formation of hematoma is common. A drain is recommended when the hydrocele sac that has been excised is large (greater than 15 cm. in diameter).[7] Lord's operation, done for small hydroceles with its minimal dissection, can avoid a drain. However, most of the hydroceles in developing countries are fairly large, and therefore need Jaboulay procedure with partial excision of sac and drainage as the operation of choice and a drain.

In this study we compared the suction drain with corrugated drain after hydrocele surgery. Both groups had similar scrotal dressing after the surgery to remove this variable from equation. The incidence of hematoma, seroma, surgical site infection and pain was similar in both groups. Similar results were seen in a study comparing corrugated and suction drains after simple mastectomy.[12] Decreased incidence of hematoma, seroma, surgical site infection and a lower VAS was expected in the study group but the difference did not reach significance, perhaps because of small number of cases in our study.

Patients with suction drain required no dressing change about 45 mL of post-operative drainage (as measured in the study group) leaking in the dressings caused discomfort and required an average 3 changes of dressings. The other advantages of suction drain include reliable measurement of effluent, minimal tissue trauma, and no skin excoriation. However; there is chance of blockage of drain and regular activation of suction reservoir is required.[13]

To our knowledge, this is the first study to compare the corrugated and suction drains after hydrocele surgery. The limitations of our study include small number of cases, so it might be impossible to show the difference in the outcome; and lack of cost comparison of the two drainage methods. However; it is obvious that patients with corrugated drains require more dressing changes and caused more work for the nursing staff. It stands to logic that patients would prefer suction drains.[12]

Conclusions

Suction drain is not inferior to corrugated drain following hydrocele surgery and has the advantage of no dressing change.

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