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Comparative study of inguinal versus scrotal approach in idiopathic vaginal hydrocele

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ABSTRACT

Background: Hydrocele is a common cause of painless scrotal swelling worldwide.

Methods: Hydrocele is a common cause of painless scrotal swelling worldwide. This prospective study was carried out at AVBRH, Sawangi Wardha, Maharashtra, India with the aim of comparing scrotal and inguinal approaches of hydrocelectomy. 100 patients were enrolled between September 2015 and September 2017 and were randomly selected for inguinal and scrotal approaches (n=50 each). They were compared on the basis of volume of hydrocele sac, operative time, post-operative hospital stay, post-operative complications, number of doses of injectable analgesia required and time of return to daily life activity.

Results: The patients' age ranged from 23 to 65 years (42.80±9.73 years) in the inguinal approach group and 22 to 65 years (41.30±11.21 years) in the scrotal approach group. Operative time in the scrotal approach group was less and was associated with more post-operative complications (pain and scrotal edema being frequent), longer hospital stay, increased requirement of injectable analgesia dosage. On the other hand, inguinal approach group had a marginally longer operative time and was associated with less post-operative pain, none to minimal complications, less hospital stay and early return to daily life activities.

Conclusions: Thus, hydrocelectomy by inguinal approach is an effective alternative method for the treatment of idiopathic hydrocele.

Keywords: Hydrocelectomy, Idiopathic hydrocele, Inguinal approach, Scrotal edema

INTRODUCTION

Hydrocele is one of the most common causes of scrotal swelling which results from accumulation of serous fluid between the layers of the tunica vaginalis. Hydroceles can be unilateral or bilateral and can cause variable degrees of enlargement of the scrotum without pain. Etiologically, this entity is categorized as congenital or acquired.

Congenital hydrocele, which results from a communication between the tunical and peritoneal cavities due to a patent processus vaginalis, usually

resolves by 18–24 months, whereas acquired hydrocele is usually idiopathic in origin and it can occur at any time during adult life.⁴

The exact mechanism of idiopathic hydrocele formation is not known. Factors such as increased serous fluid secretion, absence of efferent lymphatics, and insufficient reabsorption of fluid secreted by the mesothelium are conceivable clarifications. Other than idiopathic, causes are infection, infarction, torsion, tumors, radiotherapy, tuberculosis, or filariasis. It affects ~1% of adult men, and the adult type of hydrocele is seen mostly in men older than 40 years.⁵

The impact of hydrocele on the gonads has not been studied widely, although few have suggested that hydroceles may affect spermatogenesis and cause infertility.

The standard approach for hydrocelectomy in an adult is the scrotal approach. But the most troublesome issue by this approach is scrotal swelling, which lasts for not less than 1 month and sometimes may last up to several months. The swelling is usually large, sometimes bigger than the first issue and exceptionally discomforting.

The post-operative scrotal swelling is usually due to a combination of the usually exaggerated inflammatory edema, as a response of the very sensitive scrotal skin to incision and dissection, and accumulation of serosanguinous oozes from the hydrocelectomy site. The dependent disposition of the scrotum assists these two factors in making the scrotal swelling large painful and difficult to resolve rapidly.

The motivation behind this examination was to assess the result of hydrocelectomy through the inguinal approach as contrasted with the scrotal approach in adults.

METHODS

This prospective study was conducted on 100 patients with a diagnosis of unilateral (idiopathic) primary vaginal hydrocele during the period from September 2015 to September 2017. All patients were admitted to the Department of General Surgery, Acharya Vinoba Bhave Rural (AVBRH), under Dutta Meghe Institute of Medical Sciences, Sawangi (Meghe), Wardha, Maharashtra, India, and underwent hydrocelectomy.

These patients were divided into two groups: group I (inguinal approach group) included 50 patients whose ages ranged from 23 to 65 years, with a mean age of 42.80±9.73 years, who underwent hydrocelectomy through the inguinal approach, and group II (scrotal approach group) included 50 patients, with ages ranging from 22 to 65 years and a mean age of 41.30±11.21 years, who underwent hydrocelectomy through the scrotal approach.

The presenting symptom was scrotal swelling in all cases. In group I, 26 patients had left sided scrotal swelling while 24 patients had right sided swelling; whereas in group II, 28 patients had left sided scrotal swelling and 22 had right sided swelling.

All patients were subjected to meticulous history taking, clinical examination, routine investigations, and scrotal ultrasonography.

Inclusion criteria

• Patients with unilateral (idiopathic) primary vaginal hydrocele.

Exclusion criteria

- Patients with suspected clinical or ultrasonographic findings of testicular tumor, associated scrotal or inguinal lesions, previous history of ipsilateral scrotal or inguinal surgery, previous inguinal radiotherapy, hypoalbuminemia, non transilluminated hydroceles, giant hydroceles, or multilocular and recurrent hydroceles.
- All patients were operated upon under spinal anesthesia after obtaining written informed consent.

A comparison was made between the two groups with regard to the size of hydrocele sac, operative time, postoperative morbidity, length of hospital stay, doses of injectable analgesia required in the postoperative period, suture removal time and time of return to daily life. The patients were followed up postoperatively at 2 weeks and 1 month.

Operative technique

Hydrocelectomy utilizing the inguinal approach was performed through a skin crease inguinal incision over the external inguinal ring. Dissection was carried down to the external ring and external oblique aponeurosis. The external inguinal ring was opened by splitting the external oblique aponeurosis. The ilioinguinal nerve lying under the external oblique was preserved to minimize the risk of postoperative numbness and pain. The spermatic cord was mobilized and dislocated laterally and upwards. Gentle traction was applied on the spermatic cord and the scrotum containing the hydrocele sac was given an upward push until the hydrocele sac emerged at the inguinal wound.

The hydrocele fluid was aspirated from the inguinal wound using a 16G needle attached to a 20ml syringe to reduce its size and it could be delivered easily into the inguinal wound. After delivery of the testis into the inguinal wound, the hydrocele sac was opened, and hydrocele fluid was drained. The testis and other structures around it were then inspected for the possibility of malignancy or other lesions.

Hydrocelectomy was completed using Jaboulay's or Lord's procedure. The testis was repositioned to the hemiscrotum and the inguinal wound was closed in layers- external oblique aponeurosis and subcutaneous tissue using Vicryl 2-0 and skin using suture 2-0 polypropylene without insertion of a drain. A scrotal support was applied and sutures were removed after 5 days.

Hydrocelectomy using the scrotal approach was done through a longitudinal skin crease scrotal incision parallel and lateral to median raphae. The skin, dartos, and thin cremasteric fascia were incised as usual. Eversion of the tunica vaginalis was performed by the same methods used in the inguinal approach. After achievement of hemostasis testis was reposited back in the hemiscrotum. The wound was closed in layers using Vicryl 2-0 round bodied needle, and skin was closed by using polypropylene 2-0 cutting bodied needle without insertion of a drain. A scrotal support was applied.

All patients were given the same antibiotic for 3 doses and patients who developed complications were given few more doses of the same. Intramuscular injection of Diclofenac 50mg was used as analgesic. First post-operative dose was administered to all patients and rest doses were given after demand by the patients.

RESULTS

All procedures were successfully completed with no intraoperative complications related to surgery or to anesthesia in both groups.

There were no complications related to intraoperative aspiration of hydrocele fluid in the inguinal approach group, and all the hydrocele sacs were delivered easily into the inguinal wounds after aspiration. No underlying cause for hydrocele was found in any of the patients in both the groups.

Table 1: Observed characteristics of patients in both the groups.

Data	Group I (Inguinal approach)	Group II (Scrotal approach)	
Mean age (Years)	42.80±9.73	41.30±11.21	
Volume of Sac (ML)	202.60±45.34	218.00±52.64	
Operative time (Minutes)	45.90±10.67	38.10±10.44	
Post-op hosp. stay (Days)	4.24±1.64	5.88±1.84	
Post-op analgesia required (Doses)	2.34±1.02	3.98±3.02	
Time to return to daily life activity (Days)	6.14±1.81	8.02±1.85	

The age of the patients in the inguinal approach group ranged from 23 to 65 years (mean 42.80±9.73), whereas the patients included in the scrotal approach group had an age range of 22–65 years (mean 41.30±11.21). The difference in mean age between the two groups was statistically not significant.

The mean volume of the hydrocele sac was 202.60±45.34ml in the inguinal approach group and 218.00±52.64 ml in the scrotal approach group. The difference in mean volume of hydrocele between the two groups was statistically not significant.

The mean operative time was 45.90 ± 10.67 minutes in the inguinal approach group and 38.10 ± 10.44 minutes in the scrotal approach group. The difference in the mean operative time between the two groups was found to be statistically significant. The mean length of post-operative hospital stay was 4.24 ± 1.64 days in the inguinal approach group and 5.88 ± 1.84 days in the scrotal approach group. The difference in the mean length of hospital stay between the two groups was statistically significant.

The mean post-operative analgesia required was 2.34 ± 1.02 doses in the inguinal group and 3.98 ± 3.02 doses in the scrotal group. The difference in the requirement of doses of post-operative analgesia was found to be statistically significant. The mean time to return to daily life activity was 6.14 ± 1.81 days in the inguinal approach and 8.02 ± 1.85 days in the scrotal approach group. The difference in the mean time to return to daily life activity was found to be statistically significant.

The post-operative period in the inguinal approach passed smoothly with minimal complications which included post-operative pain at the surgical site and fever. The post-operative complications of the scrotal group included pain, persistent scrotal edema, hematoma, fever, seroma formation, wound sepsis and wound dehiscence (Table 2). Pain, persistent scrotal edema and hematoma were more frequently seen in patients of Group II and the difference in occurrence of these complications between the two groups was found to be statistically significant.

Table 2: Post-operative complications in both the groups.

Complications	(Group I) Inguinal Approach	(Group II) Scrotal Approach	Total	χ2-value	p-value
Pain	3 (6%)	13 (26%)	16 (16%)	14.88	0.0001, S
Fever	2 (4%)	4 (8%)	6 (6%)	1.29	0.25, NS
Wound Sepsis	0 (0%)	1 (2%)	1 (1%)	2.02	0.15, NS
Wound Dehiscence	0 (0%)	1 (2%)	1 (1%)	2.02	0.15, NS
Persistent Scrotal Edema	0 (0%)	7 (14%)	7 (7%)	15.05	0.0001, S
Seroma	0 (0%)	3 (6%)	3 (3%)	0.42	0.51, NS
Hematoma	0 (0%)	5 (10%)	5 (5%)	5.67	0.017, S

S = Significant; NS = Not significant

DISCUSSION

Hydrocele is a common chronic painless condition in men and causes physical, psychological, social, and distress. Numerous men assume that it's incurable, are often humiliated by the condition, and frequently lose any expectation of carrying on with an ordinary life.⁶ It may be associated with pain and can interfere with daily activities, and large hydroceles can even create difficulty during sexual intercourse.

Indications for treating a hydrocele include pain, the cosmetic appearance of the scrotum, or the patient's preference. The conservative management of a hydrocele includes observation, aspiration, and the most preferred one, sclerotherapy and which can be opted in patients with small to moderate hydrocele, who are unwilling to undergo surgery, or poor surgical candidates. Surgical excision and eversion of the sac still remains the conventional and preferred treatment for an idiopathic hydrocele.

The usual approach for hydrocelectomy in the adult is the scrotal route. The most troublesome problem in this method is a very discomforting scrotal swelling post operatively, which creates much difficulty for the patient and the managing surgeon. This problem can be avoided by performing hydrocelectomy using the inguinal approach.

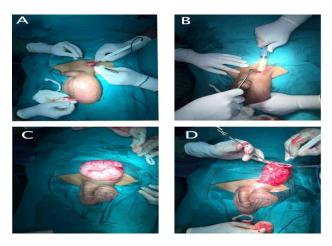


Figure 1: Hydrocelectomy by Inguinal approach:
A. Incision taken over the superficial inguinal ring, B.
Hydrocele fluid aspirated using a syringe to reduce
the size, C. Elivering the hydrocele sac with testis
through the inguinal wound, D. Eversion of sac.

Apart from almost eliminating this postoperative problem of scrotal discomfort from marked swelling, this method enables inspection, discovery of testicular malignancy, and taking safe and appropriate actions against it. It also enables easy inspection, discovery, and performance of appropriate actions on any coexisting inguinal hernia. In our study, we considered the mild to moderate scrotal swelling as a normal or acceptable sequela after hydrocelectomy, but the persistent longstanding edema is

considered to be a postoperative complication. The most commonly encountered post-operative complications in patients operated by scrotal approach were pain (26%), persistent scrotal edema (14%), hematoma (10%) and fever (8%). In contrast, pain was observed in only 6% and fever in only 4% of the patients operated by the inguinal approach while none of the patients in this group were found to have persistent scrotal edema or hematoma. The other complications found in scrotal approach group but not in inguinal approach group were wound sepsis (2%), wound dehiscence (2%) and seroma formation (6%).

Ceylan et al compared the scrotal and inguinal approaches in hydrocelectomy in 32 adult patients and observed that hematoma occurred in four patients in the scrotal approach group and in one patient in the inguinal approach group. They inferred that the inguinal approach is a suitable surgical treatment option as it results in less edema.⁷

Nweze et al opted for the inguinal approach for hydrocelectomy on 11 adult patients making an inguinal incision parallel to the inguinal ligament and aspirating the hydrocele sac through the scrotum during the preoperative preparations inside or outside the theater; his results show minimal or no scrotal swelling and nearly no discomfort in all patients.⁸

Similar observations were made in the study by Lasheen et al. There were no post-operative complications in patients of the inguinal approach group while the post-operative period of patients of the scrotal approach group was complicated by wound sepsis, wound dehiscence, persistent scrotal edema.⁹

Other studies which used scrotal approach, Naik et al., Agrawal et al, and Muneiah N et al also stated that pain, scrotal edema and hematoma formation are encountered frequently in the post-operative period. 10-12

In the present study no statistically, significant difference was found in the mean operative time between the two groups. But a remarkable finding in our study was that patients in the inguinal approach group were seen to have a shorter hospital stay and early return to normal life as compared to patients in the scrotal approach group.

In this study, the application of the inguinal approach for hydrocelectomy in adults is associated with some limitations, such as not being suitable for patients presenting with previous ipsilateral inguinal surgery, previous ipsilateral inguinal radiotherapy, and recurrent hydroceles because of associated adhesions; it is also not suitable for patients presenting with a hydrocele with thickened tunica vaginalis and for those presenting with giant hydroceles because the large mass of the tunica vaginalis after aspiration of the hydrocele sac is associated with difficulty in delivery of the testis through the inguinal incision. Further studies are needed to show

the relationship between the size of the hydrocele and the feasibility of the inguinal approach for hydrocelectomy in adults.

CONCLUSION

Thus, hydrocelectomy by inguinal approach has minimal to none post-operative morbidity, short hospital stay, brisk recovery and early return to daily life activities and is an effective alternative to the conventional scrotal approach.

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