

Injection Sclerotherapy in Encysted Hydrocele in Paediatric Population

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ABSTRACT

Objective: To determine the role of Sclerotherapy for treating encysted hydrocele in the paediatric population.

Study Design: Prospective Study

Place and Duration of Study: Department of Paediatric Surgery, Children Hospital Pakistan Institute of Medical Sciences, Islamabad for six months (1st November, 2021 to 30th April, 2022)

Patients and Methods: This study on the captioned topic involved 39 patients aging 2 to 12 years who attended the outpatient department with the complaints of scrotal swelling. In order to rule out non-communicating hydroceles, these patients were examined clinically and scrotal ultrasound was advised to all the patients which was carried out by them accordingly. In this study, the single team performed the above said procedure on Operation theatre days regularly. The incidence of complications was also monitored with each follow up visits on 1st, 3rd and 6th weeks after the procedure.

Results: Study was conducted on 39 children having mean age 4.77 ± 2.860 . Pre and post volumes of hydrocele fluid were statistically significant ($p \leq 0.05$) with average of 9.00 and 3.269 respectively. Complication rates were decreasing at every follow-up and these were not statistically significant ($p \geq 0.05$), recurrence complication was significant ($p \leq 0.05$).

Conclusion: Sclerotherapy has been found to be a positive alternate approach, which is simpler to perform, less time consuming and involving lower complication rate.

Keywords: Encysted Hydrocele, Paediatric Population, Sclerotherapy

INTRODUCTION

According to studies approximately in 80 to 94% of newborns, the processus vaginalis may persist^{1, 2}. This proportion gradually decreases until it reaches around 25-40% at two years of age³. A hydrocele may develop because of fluid accumulating between the parietal and visceral layers of the tunica vaginalis⁴. Males are more likely to develop hydroceles, which are normally painless but can cause physical and psychological problems⁵. The hydrocele in the majority of infants resolves spontaneously during the first two years of life⁶. If the problem persists, surgical treatment is usually the best option¹. However, it is estimated that the rate of complications after surgery and anesthesia is as high as 80%⁷. As a result, several studies now point to non-operative, minimally invasive, and pain-free treatment options¹. Sclerotherapy is gaining popularity as a treatment for hydrocele because it has lower morbidity, is less invasive, and has a quicker recovery time than surgery⁸. A sclerosant is inserted during a radiological procedure to treat cystic lesions and lymphatic malformations⁹. Sclerotherapy is widely used to treat hydroceles in adults¹⁰, although it is seldom used in children because sclerosants are believed to erode the sac epithelium, preventing it from producing fluid. Rassam et al. published a case study in which sclerotherapy was used to treat an abdomino-scrotal hydrocele in a 4-year-old boy with no complications¹. According to Shan et al., the success rate of sclerotherapy in adult populations ranged from 20% to 100%, depending on the type of sclerosing agent used⁸. However, there is still a lack of evidence to back up its efficacy in paediatric hydrocele cases. As a result, this research was conducted to fill this knowledge gap by determining the success rate and complications of sclerotherapy for the treatment of encysted hydrocele in children.

PATIENTS AND METHODS

This prospective study was conducted at the Department of Paediatric Surgery, Children Hospital, Pakistan Institute of Medical Sciences, Islamabad for six months (1st November, 2021 to 30th April, 2022) after taking approval from the hospital ethical committee. The Reference number of the ERB Certificate was F.1-1/2015/ERB/SZABMU/710. The sample size of thirty-nine was calculated.

The patients aged 2 to 12 years, presenting in the outpatient department were included in the study. Patients were examined clinically and scrotal ultrasound was advised to rule out

Communicating hydroceles. Only Non-communicating (Encysted hydroceles) were enrolled in the study. Baseline investigations were advised and the procedure was carried out in the Operation theatre under Inhalational Anaesthesia after written and informed consent of parents. The 25% Hypertonic Saline was used as an agent for Injection Sclerotherapy. All the procedures were performed by a single surgical team. Under inhalational anaesthesia, draping was done, Pelvis and Perineum cleaned with Pyodine solution. A cannula of 18G was inserted into the affected hemiscrotum till the hydrocele fluid came out. Fluid was aspirated with 10cc disposable syringe by attaching it with the cannula and Injection 25% hypertonic saline was injected through the cannula. The quantity of the sclerosing agent injected varied between 1cc to 3cc. Aseptic dressing was applied over the injection site and the child was discharged the same day after detailed counselling of the parents. Oral antibiotic and analgesic was advised post procedure for 3 to 5 days.

Following the procedure, the occurrence of complications was tracked for each follow-up visit on 1st, 3rd and 6th weeks. The presence of pain, hematoma, infection and any recurrence of the hydrocele were assessed and recorded. The quantity of hydrocele fluid after 6 weeks of Injection Sclerotherapy was also compared to that of fluid before the procedure through performing scrotal ultrasounds pre and post Injection Sclerotherapy. All results were noted on a predefined proforma.

WHO sample size calculator was used for determination of sample size with confidence level was 95%, population proportion was 92.8%⁽¹⁰⁾ absolute precision was 8.2% then estimated sample size was 39.

SPSS 25 was used for analysis of data. Categorical variables like complications was measured in frequency and percentages. Continuous variables that is age, pre and post volume (ml) of hydrocele was measured in mean and standard deviation. Chi squared test was used to determine the significance of categorical variables. Paired sample test was used to test the pre and post volume of hydrocele fluid. All the results were determined on baseline, 1st week, 3rd week and 6th week follow-up. P value ≤ 0.05 was considered statistically significant.

RESULTS

39 male patients were enrolled in this research protocol at 1 to 6 weeks followup. They had mean age 4.77 with 2.860 SD with $p \geq 0.05$. The pre and post volumes of hydrocele fluid were significant

with 5.7308±0.096 difference (Table 1 & fig 1). After the intervention, patients were under observation and their baseline complications were observed. 16 had complain of pain, 3 had hematoma and infection. At first follow-up, incidence of pain reduced but hematoma and infection remained constant while recurrence developed in 7 patients. The rate of success was 82.1%. At second follow-up all incidence of complications were decreased and success rate increased to 87.2%. At 6th week last follow-up, pain and recurrence decreased but hematoma and infection did not vary (Table 2). Success rate increased to 89.7%. Pre and post volume was statistically significant while no significance was shown with age. Similarly no significance was observed with pain, hematoma and infection (p≥0.05) whereas recurrence was significant (p≤0.05).

Table 1: Continuous Parameters

Variants	Mean±SD	P value
Age	4.77±2.860	0.707
Pre-injection volume	9.00±4.735	0.000
Post-injection volume	3.269±5.639	

Table 2: Categorical Parameters

Complications	Day 0	1 st week	3 rd week	6 th week	P value
Pain n(%)	16(41)	9(23.1)	5(12.8)	4(10.3)	0.475
Hematoma	3(7.7)	3(7.7)	1(2.6)	1(2.6)	0.732
Infection	3(7.7)	3(7.7)	2(5.1)	2(5.1)	0.624
Recurrence	0(0)	7(17.9)	5(12.8)	4(10.3)	0.006

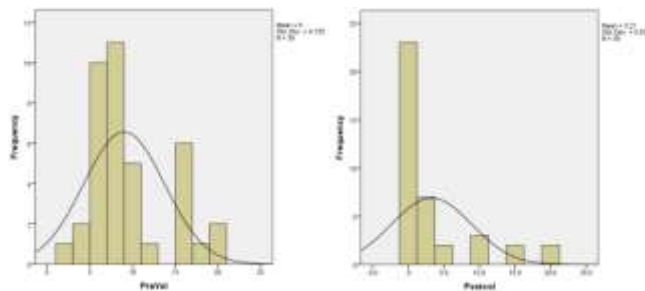


FIG 1:

DISCUSSION

Paediatric hydroceles are caused by inguinal canal development anomalies. A saclike extension of the peritoneum descends from the posterolateral genitourinary ridge during the third trimester of pregnancy, enveloping the testis and epididymis and resulting in an abdominal-scrotal serosal-lined tubular communication¹². The tunica vaginalis is formed by the serosa of the hemiscrotum and the processus vaginalis is formed by the peritoneum-derived serosal connection. The processes vaginalis of the spermatic cords merge at term, or within the first one to two years of life, obliterating the link between the abdomen and the scrotum. The process merges anteriorly to the upper epididymal pole and distally as far as the lower epididymal pole. Communication hydroceles, indirect inguinal hernias, and the bell-clapper deformity can all occur if full fusion fails^{13, 14}. In our study pain with sclerotherapy was observed in 41% of the patients and reduced to 10.3%, Hematoma from 7.7% to 2.6% and infection in 7.7% to 5.1% from day 0 to last follow up at 6th week. Volume of hydrocele fluid reduced from 9.00 to 3.269 with difference of 5.7308. Rate of success increased upto 89.7%.

Our findings were in accordance with the different studies. In a study by Latif et al., conducted in Faisalabad, the authors concluded that sclerotherapy and surgery for hydrocele produce similar outcomes, with sclerotherapy having the advantage of affordability. In their study, they noticed a recurrence rate of 40% and 12% in the sclerotherapy and surgical group respectively¹¹. According to a review study by Taylor et al., the satisfaction of 95% of the patients was obtained after sclerotherapy, and that the cure rate was 94% after multiple treatments with sodium tetradecyl

sulfate¹⁵. Rassaam et al., in their case report, concluded that, sclerotherapy was found to be curative and that it should be considered at the early stages of presentation¹. Jahnsen et al and Lund et al., also reported in favor of the management of hydrocele patients with sclerotherapy^{16, 17}. However, according to Khaniya et al., sclerotherapy had lesser complications as compared to the surgical treatments but it had a lower success rate and less patient satisfaction¹⁸. The reason for this difference might be because they conducted this study in adults and that they followed the patients for the next six months.

There are certain limitations to our study. In this report, we only included 39 patients. To gain more insights, a multi-institutional analysis with a wider sample size should be performed. We did not keep track of the patients' costs and expenditures, which would have provided us with insight into their perspective and cost control. We only followed up for 6 weeks. For better outcomes, a study with a long duration of follow-up should be performed.

CONCLUSION

Sclerotherapy can be used as an alternative treatment method for encysted hydrocele. More research with a larger sample size and a cost control tracker could strengthen these findings.

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Conflict of Interest: None

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