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Research Article

Outcome of Division and High Ligation of Patent Processus Vaginalis in Congenital Communicating Hydrocele through the Scrotal Approach Compared with the Inguinal Approach in Children

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Abstract

Background: The inguinal approach and scrotal approach can be used for the treatment of congenital communicating hydrocele. The scrotal approach avoids tampering with the inguinal canal and offers an excellent access to the patent processus vaginalis (PPV) with minimal dissection.

Objective: To determine alternative technique for congenital communicating hydrocele operation.

Methodology: Total 60 hydrocele patients were included in this study. Thirty patients were tagged scrotal approach and rest thirty were tagged with inguinal approach. The comparative parameters between two groups were the operative time and post operative complications. Patients were followed up for six months post operatively.

Results: The mean duration of operation was significantly higher in group B than group A (22.77 ± 4.84 min vs 28.25 ± 7.90 min). Scrotal haematoma was presented in 10 (32.5%) in group A and 4 (12.5%) in group B. The difference was not statistically significant between two groups. Wound infection was found 2 (6.7%) in group B, but not found in group A. Recurrence was not found.

Conclusion: The scrotal approach technique provides an easy to identify the hydrocele sac with minimum dissection. It was associated with shorter operative time and good cosmesis in comparison to the inguinal approach in treatment of congenital communicating hydrocele in children.

Keywords: *Children; Hydrocele; Inguinal; Scrotal; Surgery*

Introduction

Hydrocele is the collection of fluid within the remnant of the processus vaginalis and can be congenital or acquired [19]. Hydroceles can be unilateral or bilateral and it can cause variable degrees of enlargement of the scrotum [6]. There are no demographic or racial differences. It is not easy to ascertain an exact hydrocele incidence because of negligence of parents or children. Hydrocele usually present in 60% to 80% of males at birth but declines to under 0.8% over 2 years of age [3].

Hydroceles can also be divided into communicating and noncommunicating according to the communication with abdomen via a patent processus vaginalis [13]. If the processus vaginalis fail to close, that result in communicating hydrocoele that is connected to the peritoneal cavity [11]. Hydroceles are common in infants and children. Sometimes they are associated with an indirect inguinal hernia [9]. In older children and adolescents hydroceles may be idiopathic but may also result from trauma, tumor, infection or testicular torsion [22].

Hydroceles have a higher rate of occurrence on the right side. Daily fluctuation in the size, progressive increase in size or intermittent inguinal bulging is indicative of a communicating hydrocele [9]. An encysted hydrocele is a condition in which the fluid collection between proximal and distal constrictions anywhere along the spermatic cord and does not communicate with the peritoneal cavity. It varies in shape and size but it is not affected by the intra-abdominal pressure [4]. Most congenital hydroceles (80%) resolve spontaneously before the age of 2 years [20]. Hydroceles that persist beyond 2 years of age or those that arise in an older child require operation [9]. The primary goal of the surgical treatment of communicating hydrocele in children is to ligate the PPV as cranially as possible, with no iatrogenic injury and postoperative recurrence [14]. The hydrocele in children can be treated through either an open or laparoscopic technique. The inguinal and scrotal approaches can be used for open herniotomy [17]. The traditional inguinal incision allows easy access to the PPV and high-ligation. The inguinal approach has previously been accepted as the gold standard treatment [23]. In case of inguinal approach there is a potential risk of injury to the spermatic cord and vas deferens, hematoma, wound infection, iatrogenic cryptorchidism, testicular atrophy and recurrence of the hernia [7].

The scrotal approach helps in easy access to scrotal structures and removal of the distal tunica vaginalis without significant morbidity and excellent cosmetic outcomes [12]. Besides this scrotal approach has postoperative risk of persistent hydrocele when PPV high-ligation is inadequate. Testicular ascent may also develop [2,5]. Few study has been done in the world comparing inguinal versus scrotal approach for the treatment of hydrocele in children. This study was performed to evaluate the efficacy of scrotal approach in comparison with the inguinal approach to operation on a congenital communicating hydrocele.

Materials and Methods

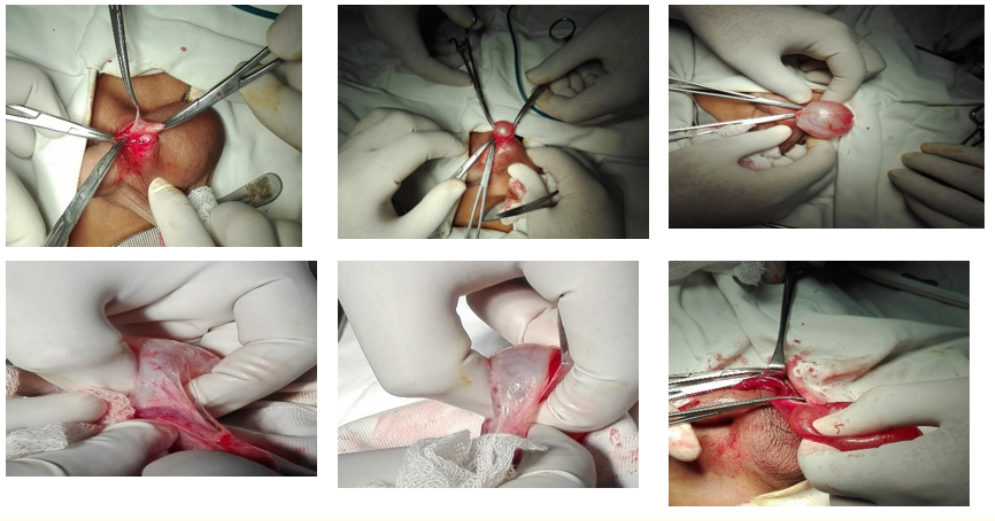
Sixty herniotomies were performed on 60 children with communicating hydrocele between March 2018 and September 2020. Physical examination is normally sufficient to distinguish a hydrocele from an inguinal hernia. If the spermatic cord feel above the mass, a hydrocele can be confidently diagnosed. This may be difficult to appreciate in the presence of a tense inguino-scrotal hydrocele. An additional feature in the clinical findings of a hydrocele includes the ability to trans-illuminate. This does not fully exclude an inguinal hernia, since an incarcerated inguinal hernia in premature infants can also trans-illuminate [16]. The other useful sign is inability to empty the fluid on firm but gentle compression of scrotum. Where the swelling is reduced by compression, the neck must be wide and diagnosis of hernia can be made. This sign is also useful in identifying the uncommon hernia which contains greater omentum in neck of its sac, large amount of fluid produced with in sac giving appearance of a hydrocele, but the fluid is emptied readily on compression [10].

Operative procedure

Scrotal approach technique

Patient was placed in supine position on the operative table, after general anaesthesia, proper painting with povidone iodine and draping was done. Injection cephradine 25 mg/kg body weight, was given intravenously (I.V). High transscrotal tranverse incision was made. Then the dartos fascia, external spermatic fascia and cremasteric fascia was incised. Identify the hydrocele sac and it was separated from the vassels, nerves and vas deference. Then the hydrocele sac was dissected upto deep inguinal ring. Hydrocele sac was divided in between two clumps. The proximal portion of hydrocele sac was ligated here and retracts in peritoneal cavity.

The distal portion of sac was opened enough to evacuate hydrocele fluid and testis was pulled down in scrotum. Wound was closed by 4-0 vicryl and skin was closed interrupted by 4-0 plain catgut. The operation time was recorded by wall clock from initiation of skin incision to last stitch of skin closure.



Picture 1: *High ligation with scrotal approach.*

Inguinal approach technique

Patient was placed in supine position on the operative table, after general anaesthesia, proper painting with povidone iodine and draping was done. Injection cephradine 25 mg/kg body weight, was given intravenously. A incision was made in a inguinal skin crease line with the medial end of incision just superior and lateral to pubic tubercle. Then dermis to subcutaneous fat, the camper fascia was spread with scissors to expose the scarpa fascia. Then a incision made over scarpa fascia and external oblique apponeurosis and it split. The undersurface of external oblique was cleared.

Then the cremasteric muscle was incised and spread with scissors to expose the spermatic cord, which was then grapsed and elevated. Vas and spermatic vassel gently separated from hydrocele sac. Hydrocele sac inspected for contents. Then empty hydrocele sac sharply divided between clumps. Proximal sac was then gently dissected up to found the preperitoneal fat was seen. Proximal sac twisted and ligated. Distal sac dropped back into the wound. Then testis was pulled back into position in the scrotum. Wound was closed in layer by layer. Skin was closed intradermally by 4-0 vicryl. The operation time was recorded by wall clock from initiation of skin incision to last stitch of skin closure.

Data processing and data analysis

Statistical analysis was carried out using the Statistical Package for Social Sciences version 25.0 for Windows (SPSS Inc., Chicago, Illinois, USA). The quantitative observations were indicated by frequencies and percentages. Chi square test was used for categorical variables. Unaired t-test was used for continuous variables. P values < 0.05 were considered as statistically significant.

Result

There were 60 children's with communicating hydrocele were included in this study. The inguinal group comprised 30 patients and the scrotal group consisted of 30 patients. These patients' ages that majority 17 (56.7%) patients belonged to age group ≤ 3 years in group A (Scrotal approach) and 19 (63.3%) in group B (Inguinal approach). The mean age was found 3.5 ± 1.4 years in group A and 3.3 ± 1.0 years in group B. The difference was not statistically significant ($p > 0.05$) between two groups.

The mean duration of operation was higher in group B than group A (28.25 ± 7.90 vs 22.77 ± 4.84), that was statistically significant ($p < 0.0001$). The scrotal haematoma was presented in 10 patients (32.5%) in group A and 4 (12.5%) in group B. The difference was not statistically significant between two group. The most common early complication of scrotal approach was scrotal haemaoma. As for hydrocele recurrence or testicular atrophy (late complications), both did not happen in either group.

Discussion

This prospective comparative interventional study was carried out in department of Paediatric Surgery of Dhaka Shishu (Children) Hospital, Dhaka. The main aim of this study was to determine alternative technique for hydrocele operation.

In this study observed that majority 17 (56.7%) patients belonged to age group ≤ 3 years in group A (Scrotal approach) and 19 (63.3%) in group B (Inguinal approach). The mean age was found 3.5 ± 1.4 years in group A and 3.3 ± 1.0 years in group B. The difference was not statistically significant ($p > 0.05$) between two groups. Oh., *et al*. (2018) reported that the mean age was found 2 years in scrotal approach group and 2 years in traditional inguinal approach. There was no statistical difference between the two groups in terms of patient age. Alp., *et al*. (2014), also observed patients' ages, but there was no statistical difference between the two groups in terms of patient age.

In this study, it was observed that majority patients (60.0% and 56.7%) had right side involvement in group A and group B. Bilateral hydrocele was 2 (6.7%) and 2 (6.7%) in group A and group B respectively. Fearne., *et al*. (2002) observed that the hydroceles are common in right side than left side, similar to the current study. The higher incidence of abnormalities on the right side may be because the right testis descends later than the left and the processus on the right side is therefore more likely to remain patent.

In this study observed that mean duration of operation was significantly higher in group B (28.25 ± 7.90 min) than group A (22.77 ± 4.84 min). Another study which was conducted by Oh., *et al*. (2018) also found mean operative time more in inguinal approach group than scrotal approach group. Operative time was statistically significantly lower in the scrotal group ($p < 0.001$). Alp., *et al*. (2014), also reported similar observation operative time was statistically significantly lower in the scrotal group ($p < 0.0001$). In this study, the operative time was short in group A due to high ligation through scrotal approach need minimum dissection to enter the scrotum. In scrotal approach easy to indentify the sac, because it filled with fluid. Besides this inguinal approach need more dissection than scrotal approach and need more time to identify the sac.

In this study, the scrotal haematoma was presented in 10 (32.5%) in group A and 4 (12.5%) in group B. The difference was not statistically significant between two groups. The scrotal hematoma more in aged children in scrotal approach. Which was small in size and resolved spontaneously, 13 patients after 1 week and 1 patient after 2 weeks. Oh., *et al*. (2018) observed scrotal hematoma was developed in one cases (0.6%) in group I and two cases (1.3%) in group II. He did not mention the cause of scrotal haematoma.

Conclusion

This study concluded that scrotal approach for the treatment of congenital communicating hydrocele in children was a simple procedure. This technique provides an easy to identify the hydrocele sac with minimum dissection, shorter operative time and good cosmesis in comparison to the inguinal approach in treatment of congenital communicating hydrocele in children.

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