Pediatrik Cerrahi Dergisi, 11:34-37, 1997

Abdominoscrotal hydrocele: Report of three cases and review of the literature*

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Özet

Abdominoskrotal hidrosel: Üç olgu sunumu ve literatürün irdelenmesi

Abdominoskrotal hidrosel (ASH) tunika vajinaliste biriken sıvının inguinal kanal boyunca uzanarak karın içerisinde de birikmesidir. İlk olarak 163 yıl önce tanımlanmış olmasına karşın, aradan geçen zamanda oldukça nadir izlenen bir tanı olmuştur. İngiliz dilinde yapılan yayınlar gözden geçirildiğinde, günümüze kadar 30 çocuk olgu bildirildiği görülmüştür. Biz burada hepsi bir yaşının altında olan üç olguda gördüğümüz dört ASH olgusunu sunuyoruz.

Anahtar kelimeler: *Hidrosel, skrotum, abdomen*

Summary

Abdominoscrotal hydrocele (ASH) is a collection of fluid in the tunica vaginalis extending through the inguinal canal into the abdominal cavity. It has been a rare diagnosis since its first description 163 years ago. A review of modern English literature revealed 30 pediatric cases reported so far. We report three additional cases with four ASH's all under the age of one.

Key words: *Hydrocele, scrotum, abdomen*

Introduction

Although the first report on abdominoscrotal hydrocele (ASH) dates as back as 1834 [7], it is seldom encountered in surgical practice performed both on adults and on children. A review of modern English literature revealed 30 pediatric cases reported so far with 24 cases under the age of one [1,2,4-6,8-22]

We report three further cases with four ASH's with emphasis on the proposed mechanisms of cause and diagnostic evaluation.

Case Report

Case 1: *This patient was first seen at our outpatients clinics at the age of 40 days with the complaint of left scrotal swelling which was diagnosed as a non-communicating hydrocele. In his second visit at the age of 10 months, the hydrocele was found out to be a communicating one. Surgical intervention was planned. Physical examination after the induction of anesthesia revealed a bulging mass in the left lower quadrant (LLQ) by manual compression of the hydrocele. Upon releasing the scrotal compression, the mass disappeared with a rapid back filling of the hydrocele (Figures 1 and 2).*

This maneuver was repeated a few times with the same physical findings. A diagnosis of abdominoscrotal hydrocele was thus made. A urethral catheter was inserted into the bladder and a standard inguinal skin crease incision was made. The inguinal canal was opened. The sac was needle aspirated. By gentle traction and dissection, abdominal component of the sac was delivered out of the wound. The dissection was carried out on the scrotal component and ASH sac was removed as a whole. The patent processus vaginalis was ligated. The internal ring was recontructed and the wound was closed in layers. His physical examination was normal 2 years after the operation.

* This study was partially presented as a poster at XIV Annual International Congress of the Turkish Association of Pediatric Surgeons (26-30 September 1995, Pamukkale, Turkey)

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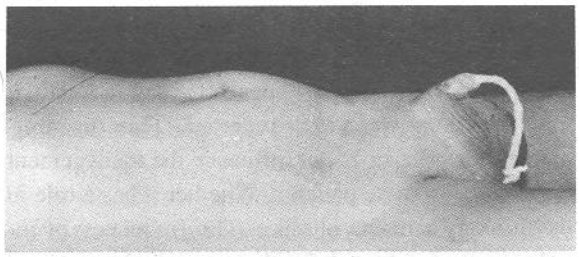

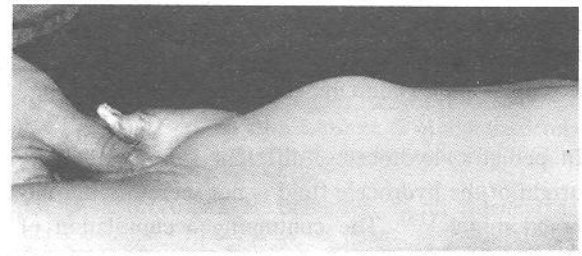

Figure 1 and 2. Appearance of a LLQ cystic mass upon compression of scrotal hydrocele.

Case 2: *This 6 month old boy presented with the complaint of left scrotal swelling present since birth. By physical examination, a communicating hydrocele was diagnosed and was assigned for operation. Under general anesthesia, upon compression of scrotal fluid an abdominal mass in the LLQ was detected. The repeated compression and release of scrotal fluid resulted in the same findings as described for the first case. The diagnosis of ASH was obvious. After insertion of a urethral catheter, standard inguinal skin crease incision was performed. The inguinal canal was opened. The sac was aspirated. The internal ring was wide and distorted. Complete freeing of the intra-abdominal component of the sac by gentle traction and dissection was done. A rim of the posterior wall of sac was left in place due to dense adhesions between the vas and the sac; the rest was removed. The patent processus vaginalis was high ligated. A partial scrotal hydrocelectomy was done. His physical examination was normal eight months after the operation.*

Case 3: *This boy was first seen at our outpatients clinics at the age of 2 1/2 months and had the diagnosis of a right noncommunicating hydrocele. Two months later, he developed a left-sided hydrocele as well. No communication was detected by manual compression on either side. Both hydroceles increased in size in the ensuing visits without any communcation with the peritoneal cavity. At the age of eight months, to our surprise, both hydroceles became easily reducible by manual compression. However, the scrotal fluid rapidly filled back each time the scrotums were emptied. Although no abdominal mass could be palpated, ASH was suspected and an ultrasonographic examination was performed which confirmed the diagnosis of bilateral ASH. Upper urinary tracts and bladder were normal. The operation was performed by bilateral inguinal skin crease incisions after insertion of a urethral catheter. Inguinal canals were opened and sacs were aspirated bilaterally. The internal rings were dilated. Abdominal components were removed totally and standard partial hydrocelectomies were performed at scrotal sacs. High ligation of quite large patent processus vaginalis was done on both sides and the wound was closed in a standard manner. His physical findings are currently normal four months after the operation.*

Discussion

An ASH is a collection of fluid in the tunica vaginalis extending through the inguinal canal into the abdominal cavity [17]. It is a rarely encountered diagnosis in childhood. The reports have not reached a consensus to explain the origin of the pathology, the necessary preoperative investigations and the appropriate operative technique.

Dupuytren believed that increasing distention of an ordinary hydrocele of tunica vaginalis may push its way up through the inguinal canal to assume an intraabdominal position [7]; this gained much acceptance to explain the etiology of adult ASH. This theory was supported by Brodman et al. with further explanation of the pathology on the basis of the Rule of Laplace [3]. They believe that hydroceles in the adult secrete fluid and continuing accumulation of fluid in the scrotal sac results in an elevation of intrascrotal pressure above the intraperitoneal pressure of 4-6 cm.

The inexpansile coverings of the inguinal canal causes this pressure to be transmitted to the internal ring. As scrotal pressure remains higher on the basis

of Laplace's law and as the pressure reflected on the internal inguinal ring increases, the sac may be pushed up to expand into the abdominal cavity.

In pediatric hydroceles, different from adults, the origin of the hydrocele fluid is not secretory but intraabdominal [18]. The continuing accumulation of fluid is to come directly from the peritoneal cavity. It is most likely that these children originally have an "infantile" type hydrocele with the hydrocele sacs extending well upwards within the inguinal canal to communicate with a patent processus vaginalis at the level of internal inguinal ring almost in a side-by-side manner. Continuing distention of the sac results in compression on this communication. Thus a one-way flap valve mechanism is created which prevents the reascend of scrotal fluid into the peritoneal cavity.

As the fluid continues to accumulate the sac expands upwards into the abdominal cavity. At this point, a decreased resistance at the level of internal inguinal ring or an unusually wide ring may be contributory to facilitate the abdominal expansion [22]. The internal rings of infants presented here were wide and distorted. This may be secondary to a primary congenital anomally representing a weak area of low resistance or due to the extrinsic compression by the hydrocele sac.

The report by Uehling et al gives some clue to support the possible existence of a flap valve mechanism between the ASH sac and the peritoneal cavity [20]. In this report, the authors failed to fill the patent processus vaginalis by retrograde route after contrast injection into the sac. They later on found out that there was a patent processus vaginalis which communicated with the ASH.

In children, the processus vaginalis should be patent for an ASH to develop. The processus vaginalis was patent in all four of ASH's reported here and were high ligated. However, the communication between the processus and the ASH might have already been undergone obliteration by the time of operation. A patent processus may become evident only after removal of ASH. Therefore, a patent processus vaginalis must be searched for and high ligated.

Almost all ASH's reported in children are located retroperitoneally as in three ASH's in this report [4-6,10,12,13,17,21,22]. Properitoneal [2] and interstitial [8,18] locations were also reported. This discrimination, however, does not influence the management or outcome of these patients. Whether it has a role in the etiology remains obscure. The frequency of involvement of right or left sides appears almost equal in reports. Two previously reported cases were bilateral [14,21]; we report an additional case of bilateral ASH.

In previous reports where an abdominal mass was palpated preoperatively, the investigative work up included plain abdominal graphies, ultrasonography, CAT scan and MRI [1,4-6,8,12-16,18-21] as well as, invasive procedures such as contrast injection into the sac, VCU, IVP and several analyses for malignancy, including bone marrow aspirates and biopsy [5,8,10,12,13,18,19]. As in our first two cases, discovery right after the induction of anesthesia or even intraoperatively has been reported for several cases with ASH [2,17,22]. No confirmatory preoperative diagnostic studies were performed in our first two cases. We suspected the presence of ASH in the third case by rapid backfilling of the scrotal sac without a palpable abdominal mass (springing back ball sign) [22]. A thorough ultrasonographic examination confirmed our diagnosis.

We doubt whether further diagnostic work up except for ultrasonography would have been necessary in the first two cases, if the springing back ball sign had been elicited long before operation. Regarding the reported cases with hydroureteronephrosis due to extrinsic compression of ASH [15,19] an ultrasonogram may be all that is needed preoperatively to evaluate both the abdominal mass and the urinary tract.

A standard inguinal skin crease incision has proven to be satisfactory in our cases and we advocate this incision for ASH. Catheterization of the urinary bladder enables a more secure dissection and is advised. After opening the inguinal canal and aspiration of the saccular fluid, the wide internal ring allows dissection to be carried out easily for removal of the abdominal component of the sac. Total removal of the scrotal sac is not absolutely indicated,

especially if this bears risk of damaging the testicle or the vas due to adhesions. After removing the abdominal component of the sac, the processus vaginalis should be searched for and ligated.

As in all rare surgical diagnoses of children, the importance of being aware of the entity "ASH" must be justified. A rapidly backfilling communicating hydrocele should raise the suspicion of ASH and the abdomen should be palpated carefully for a mass. An abdominal ultrasonography should be done in all rapidly backfilling hydroceles. A standard inguinal approach enables both the removal of the abdominal component of the sac and ligation of the processus.

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