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ABDOMINOSCROTAL HYDROCELE IN CHILDHOOD

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Abdominoscrotal or pelviscrotal hydroceles are fluid collection in the tunica vaginalis that extend from the scrotum into the lower abdominal cavity through the inguinal canal. Fourteen cases are reported; eleven cases were unilateral, and the other three were bilateral. Their age ranged from 6 to 24 months. Diagnosis was based on clinical examination in most cases and confirmed by ultrasound examination. One case was diagnosed intraoperatively. Surgical excision was performed through a generous inguinal incision in all cases. Although rare, abdominoscrotal hydroceles can present unexpectedly to the paediatric surgeon, or may mimic abdominal swelling in infancy and childhood such as massive hydronephrosis or bladder diverticulum[1]. Literature of abdorninoscrotal hydrocele and various theories are discussed.

Keywords: Hydrocele, Abdominoscrotal, Abdominal mass.

INTRODUCTION

Abdominoscrotal hydrocele is a rare condition both in adults and children. Although it has been described for almost a century, it has not been written in the standard paediatric surgical textbooks[2]. Dupuytren first described it in 1834 as "hydrocele en bisac". Syme (1861) was the first to describe the condition in childhood. Bickle, in 1919 defined it and gave it the name "Abdominoscrotal hydrocele"[3]. The classic history of such cases is that of a simple hydrocele that will present as a gradual swelling in the lower abdomen. Voiding abnormalities, unlike in adults, are uncommon[4] Various theories were introduced to explain such a condition. The increase in the incidence of abdominoscrotal hydrocele reports can be explained by the increased awareness of the paediatric surgeons to such condition and the availability of diagnostic tools like ultrasound[5]. Although it is less frequently encountered than the usual type of hydrocele, the exact anatomical structure should be clear to the treating surgeon because the management of both conditions differs especially in terms of timing and technique of the operation.

PATIENTS AND METHODS

Fourteen male patients presented with abdominoscrotal swelling.

All patients had a thorough abdominal and scrotal examination. On scrotal examination a markedly tense hydrocele was noted and the testis could be palpated in only three patients. Using transillumination the testis position was verified in the other cases. The abdominal component was detected on abdominal examination once the baby was made quite (either by giving him something to suck or by putting him to his mother's lap). All hydroceles showed incomplete compressibility with synchronous increase in the abdominal component, showing cross fluctuation with the scrotal component (Fig. 2). A characteristic roaring feeling was illustrated as the fluid shifts from the scrotal component into the abdominal portion in all cases. All cases, which were diagnosed preoperatively, had an abdominal and scrotal ultrasound to confirm the diagnosis (Fig. 3).

Surgery was performed once the diagnosis was confirmed. Under general anaesthesia a generous inguinal incision was made through the lower abdominal skin crease. Delivery of the scrotal component was possible after aspiration of some of the contained straw colored fluid. Only a small amount of the contained fluid was aspirated just enough to deliver the hydrocele as the intraluminal fluid stretches the tissues and aids in dissection. After opening the inguinal canal, the hydrocele

sac narrows as it passes through the tight inguinal canal stretching both rings on its way to the abdomen. The abdominal component of the hydrocele is then delivered both by gentle traction and applying mild abdominal pressure (Fig. 4). Intraluminal septa were found in four cases. In contrast to the regular infantile hydrocele, no connection was found with the peritoneal cavity. Instead a peritoneal knuckle was found in all cases and was incised and transfixed. The entire hydrocele wall is removed except for a small rim around the testis, which was found flattened from side to side. The internal inguinal ring was then narrowed and the canal repaired behind the cord. In no case was a drain inserted. In the first bilateral case, each side was done in a separate session because of fear of huge postoperative seroma causing urine retention. In the last two cases both sides were done in the same sitting after meticulous haemostasis. Apart from an acceptable scrotal oedema, the postoperative period was uneventful in all cases.

Graph 1: Incidence of Abdominoscrotal hydrocele on either side

RESULTS

Fourteen male children were treated from abdominoscrotal hydrocele. Their age (Table 1) ranged from 6 -24 months (mean 17 months). The condition was bilateral in three. Nine of the unilateral cases were on the left side (graph 1). In most of the unilateral cases a small vaginal hydrocele was present (7 out of 11) on the contralateral side.

The main presenting symptom was a huge scrotal swelling (10 out of 14) (Fig 1). Two cases were referred with the diagnosis of a large pelvi-abdominal cystic mass interpreted by the radiologist as huge hydronephrosis. In one case an abdominoscrotal hydrocele lead to hydronephrosis by compressing the left ureter. One case was diagnosed intraoperatively with a preoperative diagnosis of infantile hydrocele. During an elective surgery for an infantile hydrocele in a 24-month-old patient, the abdominal component was delivered and the diagnosis was made intraoperatively.

Table (1): ***Distribution of patients among different age groups.***

Age	*No. of patients*
6 months	1
8-12 months	6
12-18months	5
18-24 months	2

Intra-abdominal portion was measured using abdominal ultrasound in all cases diagnosed preoperatively (13 out of the 14 reported cases, Table 2). Family history was negative in all cases. Follow up ultrasound was performed in 7 patients for 6 months postoperatively and no recurrence was noted.

Table (2): ***Size of the intra-abdominal part in the 13 cases diagnosed preoperatively.***

Size of intra abdominal part	*No.*
5-8 cm	8
8-10 cm	3
> 10 cm	2

Fig (1): A huge hydrocele with a lower abdominal extension

Fig (2): Hydrocele showed incomplete compressibility with synchronous increase in the abdominal component, showing cross fluctuation with the scrotal component

Fig (3): Ultrasound appearance of abdominoscrotal hydrocele

Fig (4): Intraoperative appearance after delivery of intra-abdominal and scrotal component

DISCUSSION

Normally the testis descends through the inguinal canal at the seventh month of foetal life. Once in the scrotum, it is enveloped by the processus vaginalis; which loses its connection with the general peritoneal cavity around the time of birth [4],

The definition of abdominoscrotal hydrocele has been well described, but the exact mechanism of its formation remains unknown. The initial mechanism by which the hydrocele starts its existence is different in adults and infants. In adults the fluid is secreted by the tunica vaginalis thus producing a hydrocele in infants on the other hand the fluid penetrates from the peritoneal cavity, it fills the persistent vaginal process and forms a hydrocele. The enlarging hydrocele by pressing on the vaginal process in the inguinal canal creates a one way valve preventing the fluid reflux from the hydrocele to the peritoneum [6].

Several mechanisms were suggested to explain the phenomenon of the abdominoscrotal hydrocele but the exact mechanism is still not clear. Dupuytren believed that distension of the tunica vaginalis might replace it through the inguinal canal into the abdomen to form the abdominal component of the hydrocele [1] .In 1977 Harold Brodman and associates [7], explained the development of the abdominal part of the hydrocele on the basis of Laplace's law. An increasing pressure within the hydrocele is transmitted above the deep inguinal ring because of the inexpansible musclofascial coverings of the inguinal canal. When the Intracystic pressure exceeds that of the intraabdominal (4 to 6 cm H_2O), the abdominal component of the hydrocele develops and extends. Sasidhran[8] suggested the possibility of intra-abdominal hydrocele that is pushed by an increase in the intra-abdominal pressure. Additional factors such as weakness in the inguinal canal walls was suggested, such weakness would permit the extending hydrocele to reach the abdomen [9].

The classic presentation of this type of hydrocele is that of a simple abdominoscrotal mass that is mostly discovered during examination of a tense infantile hydrocele [10]. Several other presentations have been reported. Local pressure on nearby structures caused ipsilateral hydroureter and hydronephrosis in two reports [4,11], and unilateral lower limb oedema in another [12]. Both conditions resolved completely following the removal of the hydrocele. Abdominoscrotal hydrocele may also present due to the local changes in the hydrocele such as partial torsion that cause acute abdominal symptoms or due to neoplastic changes in the mesothelial lining presenting as a mesothelioma[13].

All the cases studied were diagnosed preoperatively save one where the diagnosis was made intraoperatively. Two cases were referred as being huge hydronephrosis. Careful abdominal and scrotal examination gave a clue to change the diagnosis. In one case the tense abdomInal portion of the hydrocele caused left hydronephrosis by compressing and stretching the left ureter. Following excision of the hydrocele the hydronehrosis settled quickly. No associated abnormalities were noted in any of the cases.

Abdominoscrotal hydroceles can be missed during clinical examinatIon. Careful examination can give a clue to the diagnosis in most cases. Among the most useful clues in the diagnosis of this condition is its incomplete reducibilIty into its abdominal component. When the examining surgeon places his hand over the abdominal part during his attempt at reduction a characteristic roaring feel can be demonstrated as the fluid shifts between both compartments. In 1993, Wlochynski, et al [9] named this character: "springing back ball sign".

To define the size of the abdominal part and the relation and effect of the hydrocele on neighbouring structures different diagnostic modalities were used in Literature. Injecting dye in the abdominoscrotal hydrocele to demonstrate the abdominal extension was among the first diagnostic techniques [3]. Several authors used ultrasound to establish the diagnosis [4,5,11,14]. Because of its accuracy and being non-invasive ultrasound is considered the investigation of choice [11]., Ultrasound can elicit the diagnosis antenataly[8]. , In other reports MRI was used to demonstrate the exact anatomy in patients complaining from abdominoscrotal hydrocele [12,15]. , In this study ultrasound examination was accurate in all these cases in determining the exact size of the abdominal portion and locating the testis when its position cannot be confirmed clinically. It was also accurate in ruling out any associated anomalies and any pressure effect on nearby structures.

Because it is liable to complications, surgery should be performed as soon as the diagnosis is established. Unlike the more common infantile hydrocele it is unlikely to disappear on its own and it compresses the testis causing it to be flattened and oblong. More over the condition is distressing to the child's parents [16].

Although an abdominal incision has been described to remove such a hydrocele, the inguinal approach has always been enough for complete excision [17]. When meticulous haemostasis is taken in consideration, bilateral cases can be dealt with in the same time and no drain would be necessary.

In conclusion:

Abdominoscrotal hydrocele in children is a rare condition but should be considered in:

- Any case of lower abdominal mass associated with a hydrocele of the spermatic cord or testis.

- Cystic lower abdominal masses such as massive hydronephrosis, bladder diverticulum, extra and intra-peritoneal lymphangioma.

- Neoplastic lower abdominal cavity masses. e.g., pelvic neuroblastoma and in children with leg oedema or upper urinary tract obstruction.

Surgery is the treatment of choice for removal of the cyst wall and reconstruction of the inguinal canal.

- Surgery should be performed once the diagnosis is established.

- Meticulous haemostasis should be performed in all cases especially bilateral ones.

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