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Scrotal approach for the correction of an abdominoscrotal hydrocele: Medium term follow-up

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Abstract Describe the scrotal surgical approach for abdominoscrotal hydrocele (ASH) with preservation of testicular function with midterm follow-up. Two patients diagnosed with ASH and contralateral testicular abnormalities. Both had scrotal correction for ASH, one had contralateral testicular neonatal torsion and the other contralateral communicating hydrocele. Four-year follow-up no complications or recurrence, and normal Anti-Mullerian hormone level. This pathology is a clinical diagnosis and it is treated with surgery via a scrotal approach, preventing sequels, contralateral complications and preservation of testicular function.

Key Words Abdominoscrotal hydrocele; children; surgery; testicular dysmorphysm.

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INTRODUCTION

The abdominoscrotal hydrocele (ASH) is a rare congenital inguinoscrotal abnormality with an incidence between 1.25% and 3.1% of reported congenital hydroceles [1,2]. There are four theories that may explain its pathogenesis. Dupuytren [2] first described it in 1834 as an abnormal fluid production in the tunica vaginalis causing excessive distention and displacement of the hydrocele into the abdomen. Afterwards, Brodman et

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al [3] stated that a less distensible musculofascial covering of the inguinal canal causes an increased pressure and when the pressure of the scrotal hydrocele exceeds that of the intraperitoneal cavity, the abdominal component develops. A third theory suggests the existence of a unidirectional valve-like mechanism in the persistent processus vaginalis leading to its extension [4]. The presence of a peritoneal diverticulum or a defect in the deep inguinal area would be the fourth hypothesis that supports the development of an abdominal component [2].

Clinical diagnosis is based on the presence of a large scrotal hydrocele that extends through the inguinal canal and into the abdomen - *pars abdominalis* (Fig. 1A, B). The classical sign of this pathology is the "*springing back ball*" characterized by a fluctuation between the scrotal and abdominal component when adding manual pressure over each one [5]. Ultrasonographic evaluation confirms the diagnosis in most cases without needing further studies [6].

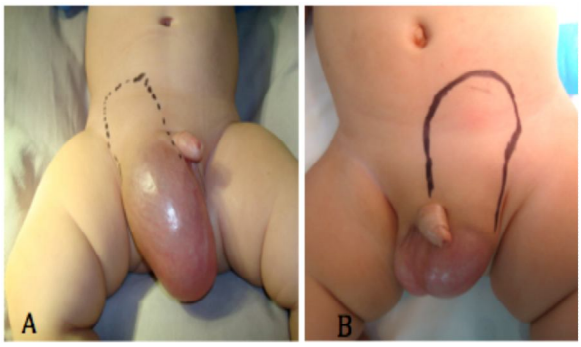
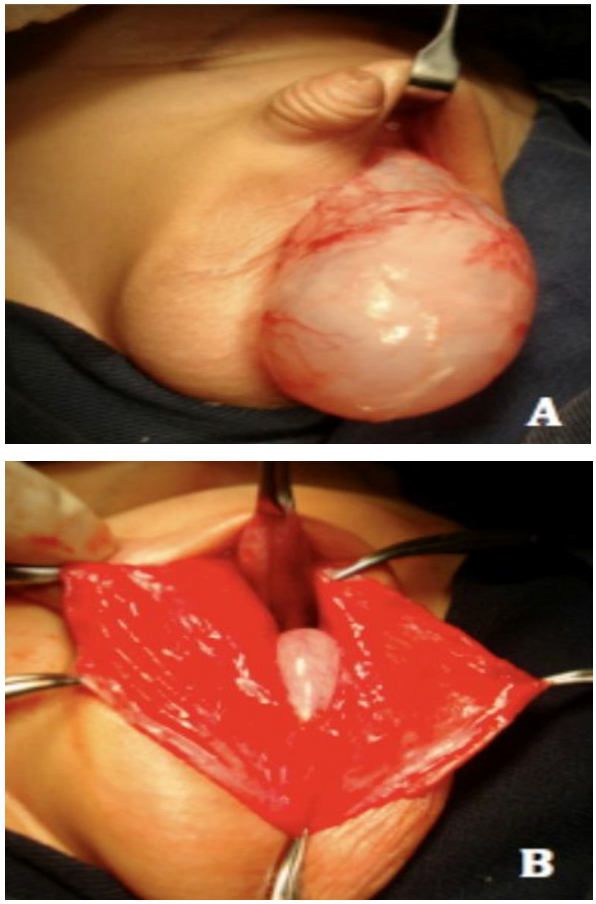


Fig. 1. Pars abdominalis. **A)** Case 1 **B)** Case 2.

Surgical technique

A high scrotal incision is made, and dissecting until the tunica vaginalis is exposed. Afterwards, a full dissection of the tunica is done in a cephalic orientation avoiding its rupture (Fig. 2A). Once the tunica vaginalis has been disected from the scrotum, it is opened on its anterior aspect in the longitudinal axis, away from the testis and its elements (Fig. 2B). The residual tissue is removed and cut edges of the tunica vaginalis are cauterized (modified Lord´s technique) (Fig. 2C). Finally a sub-dartos pouch technique is performed for testicular fixation.



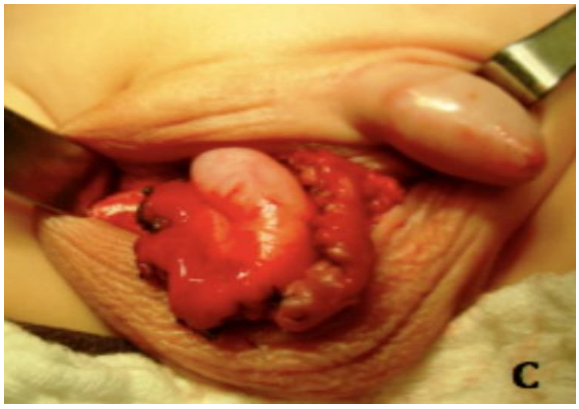


Fig. 2. A) Exposed tunica vaginalis avoiding rupture. **B)** Opened tunica vaginalis and exposed testicular dysmorphism. **C)** Modified Lord's technique.

CASE REPORT

Case 1

A 6 month-old male presented with right scrotal enlargement and left testicular atrophy since birth. Physical examination and testicular ultrasound confirmed the diagnosis of right ASH, revealing a right testicular dimension of 12x6x9 mm, dysmorphism given by elongation of its longitudinal axis (Fig. 3A) and left testicular atrophy.

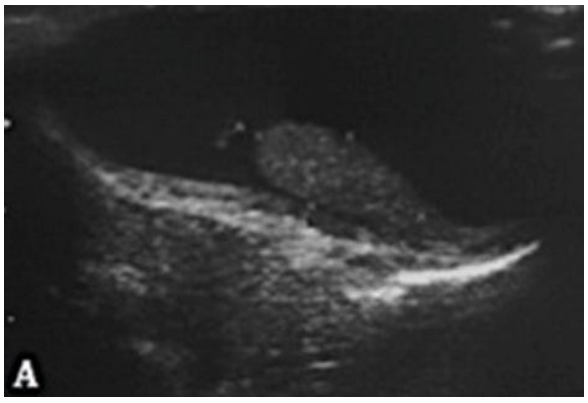


Fig. 3A. Preoperative testicular dysmorphism.

A right scrotal hydrocelectomy and a left orchiectomy due to compatible findings with neonatal torsion were performed. Pathology reported vascular infarction with hemosiderin deposition in the left testicle. A four-year follow-up ultrasonogram described a 24x18x8 mm right testicle with altered echogenicity; Anti-Mullerian hormone was within normal range.

Case 2

A 4 month-old infant presented with progressive left scrotal swelling since his first week of life. On physical examination, a large left scrotal hydrocele that extended to the superior area of the inferior abdominal skin fold was identified (Fig. 3B).

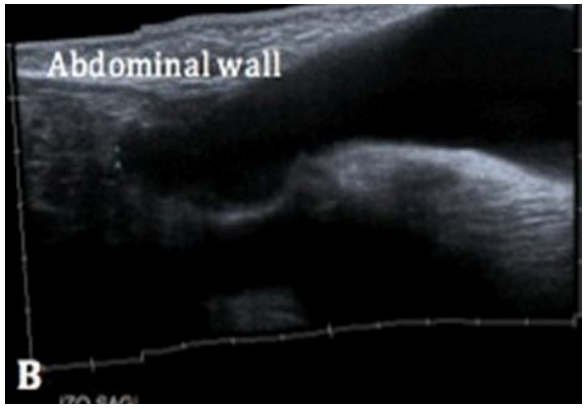


Fig. 3B. Sagittal plane, observing scrotal liquid extending through IC and lower abdominal cavity.

Testicle was non palpable. In the right side, a communicating hydrocele was noted with a palpable testicle. Ultrasonography confirmed the diagnosis: left hydrocele with

6 cm in diameter extending to the abdominal cavity up to bladder level (Fig. 3C) and testicular dimensions of 14x10x8mm; right hydrocele, with testicular dimensions of 15x13x10mm.

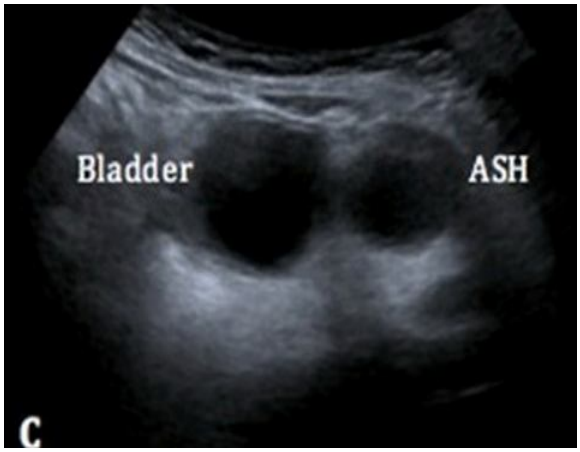


Fig. 3C. Intra-abdominal transverse plane, observing the bladder and to the left side the extension of the ASH through the inguinal canal.

Surgical correction was performed using the technique described with excellent postoperative results and without complications or recurrence during one-year follow-up.

DISCUSSION

ASH is an unusual condition. It begins with a neonatal scrotal hydrocele that expands during the first month of life towards the IC and abdominal cavity [5]. In our two cases, the hydroceles manifested as ASH since the neonatal period with a progressive volume increase during observation time.

Surgical management is the gold standard treatment for this pathology. Some authors recommend early correction, between 6-12 months of age [7] to prevent testicular abnormalities like testicular dysmorphism (TD) [8]. Changes in gross testicular morphology are associated with ASH, being the testicular flattening the most frequent alteration followed by testicular atrophy and thickening of the epididymis and spermatic cord [8]. Case 1 had persistent TD but preserved testicular function with normal Anti-Mullerian hormone in four-year follow-up. On the other hand, Vaos et al [9] reported that 30.1% of infants with unilateral ASH had contralateral testicular abnormalities like simple hydrocele, undescended testicle, intrauterine testicular torsion and testicular regression. Our two patients had contralateral abnormalities that were resolved during surgical procedure.

Considering the optimal operative approach, this pathology does not imply persistency of the processus vaginalis, consequently, the inguinal approach is not an appropriate access because it can be challenging and extensive; structures such as vessels, vas deferent and epididymis are desegregated into the tunica vaginalis due to the hydrocele [10]. Therefore, the intra and postoperative

rate of complications increases substantially [11]. Other surgical techniques described include the intraperitoneal, preperitoneal and laparoscopic approach. Both the preperitoneal approach described by Luks et al [12] and the scrotal approach with laparoscopic assistance described by Kinoshita et al [13], allows ASH confirmation, bilateral evaluation of possible inguinal ring permeability, further obliteration and confirmation of ASH correction. The scrotal approach alone was proposed by Ferro [5]; then Belman et al [7] described Lord's modified technique (plication of tunica vaginalis). In our patients, the tunica vaginalis was resected and the cut edges were cauterized. This approach is safe, simple and effective for the treatment of ASH [11]. Spontaneous resolution is still interrogated, cases reporting regression eventually needed surgically correction for scrotal component [14,15].

ASH is diagnosed with a complete physical examination and successfully treated with surgical scrotal approach. This surgical technique is minimally invasive and is associated with few intraoperative and postoperative complications. In our experience, this approach was found to be efficient at midterm follow-up preserving testicular function.

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