Received: 2015.08.25
Accepted: 2016.03.22
Published: 2016.07.14

ISSN 1941-5923
© Am J Case Rep, 2016; 17: 490-493
DOI: 10.12659/AJCR.895765

Testicular Ectopia in the Anterior Abdominal Wall of a Neonate: A Rare Site of Ectopic Testis

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
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Conflict of interest: None declared

Patient: Male, 3-day
Final Diagnosis: Ectopic right testis in anterior abdominal wall
Symptoms: —
Medication: —
Clinical Procedure: Testicular ultrasound and MRI abdomen
Specialty: Radiology

Objective: Unusual clinical course
Background: Abnormal testicular descent can either be undescended or, less commonly, ectopic. Most undescended testes complete the course of descent by the first year of life only if these remain in the normal path of descent. The deviation of the testis may occur to an ectopic location during the transinguinal phase. Of the known ectopic sites, the anterior abdominal wall is the rarest site of testicular ectopia and to our knowledge only 3 cases of this nature have been reported in the available literature to date.
Case Report: This rare case of testicular ectopia occurred in a 3-day-old boy in whom the right scrotal sac was empty; on abdominal ultrasound, the right testis was found in the subcutaneous tissues of the right antero-lateral abdominal wall. These findings were confirmed on abdominal MRI, where the right testis was seen beneath the skin between the subcutaneous tissues and external oblique aponeurosis. No aponeurotic or muscular defect was appreciable under the abdominal wall. The neonate underwent orchiopexy at the age of 6 months and remained uneventful postoperatively.
Conclusions: Preoperative imaging is recommended to detect and confirm the ectopic site as well as the morphology of testis, thereby increasing the chance of surveillance and preservation of an ectopic testis. Imaging can serve as preoperative road mapping to localize the exact site for surgical exploration of an ectopic testis if there is no apparent or palpable swelling over the anterior abdominal wall.

MeSH Keywords: Abdominal Wall • Cryptorchidism • Testicular Diseases

Full-text PDF: <http://www.amjcaserep.com/abstract/index/idArt/895765>

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Background

Testicular descent theories have evolved over time from bi-phasic to triphasic and then ultimately penta-phasic hypotheses [1]. However, the emphasis has been on the transinguinal phase, considered crucial for the testicular ectopia. Abnormal testicular descent can either be undescended or, less commonly, ectopic, and is found in about 5.9% of male newborns in the UK [2] and up to 9% in Denmark [3]. However, about 80% of undescended testes complete the course of descent by the first year of life only if these remain in their normal pathway of descent. During the transinguinal phase of descent, the deviation of the testis may occur to an ectopic location. Out of the known ectopic sites, the anterior abdominal wall is the rarest site of testicular ectopia and to our knowledge only 3 cases of this nature has been reported in the available literature to date.

Case Report

A 3-day-old boy was referred to the Medical Imaging Department from the Pediatrics Department with a history of empty right hemi-scrotum since birth. The right testis could not be palpated in the inguinal region or in the common ectopic sites. The left testis was found in its respective hemi-scrotal sac on clinical examination. The other noteworthy clinical findings were an ejection systolic murmur, subsequently confirmed on

echocardiography as a small atrial septal defect (ASD), and bilateral club foot (talipes equinovarus).

Initially, inguino-scrotal and abdominal ultrasound was performed in search of the right testis, which was ectopically located in the right subcutaneous tissues of the antero-lateral abdominal wall superficial to the anterior abdominal wall muscles, somewhere between the costal margin and iliac crest (Figures 1, 2). The ectopic right testis was otherwise normal-appearing, with adequate Doppler flow signal. Mild fluid around the right testis was appreciable and was likely related to patent processus vaginalis.

Limited MRI abdomen was planned without any sedation and a selective T2W sequence was used in axial and coronal planes to further delineate the course of the ectopic right testis (Figure 3). MRI confirmed the sonographically detected ectopic right testis, which was seen lying along the right lateral abdominal wall between the level of the umbilicus and the iliac crest, approximately at the L4/L5 vertebral disc level; it was seen beneath the skin, between the subcutaneous tissues and external oblique aponeurosis. No aponeurotic or muscular defect was appreciable underneath the abdominal wall. The testis was contained within a sac-like structure surrounded by fluid and the spermatic cord was traceable from the level of superficial inguinal ring, extending up all the way along the right lateral abdominal wall associated with mild surrounding hydrocele. The ovoid ectopic right testis was normal in size, measuring 10.4×6.4 mm, with relatively isointense signal intensity on T1W and T2W images. The right scrotal sac was empty and collapsed. Imaging features suggested ectopic right testis which was not in the line of normal descent, and was likely arrested during the transinguinal phase of testicular descent. The left testis was retractile and seen within the scrotal sac

Figure 1. Line diagram demonstrating normal testicular descent (left hemi-abdomen) and ectopically located right abdominal wall testis (expected route of descent in our case). Courtesy Salman Atiq Siddiqui, Medical Imaging, IABFH, NGH, KSA.

Figure 2. Longitudinal abdominal ultrasound image through the right flank. Ectopic right testis is lying superficial to the musculature of anterior abdominal wall (yellow stars) in extraperitoneal location. Note minimal fluid around the ectopic testis; liver and bowel loops are seen beneath the anterior abdominal wall.

Figure 3. MRI abdomen; T2W coronal (A) and sagittal (B) selected sequences confirmed the presence of ectopic right testis lying in the subcutaneous plane between the fascia and the external oblique aponeurosis of right lateral abdominal wall with minimal fluid in the sac containing the right testis.

in the initial sequences, and it later moved up into the left inguinal canal. The left testis was also normal in size and measured 10.0×6.0 mm. There was no hydrocele seen on the left side. No features of inguinal hernia were noted. Visualized liver, spleen, gallbladder, pancreas, kidneys, and the urinary bladder were unremarkable for any abnormality. No other gross structural abnormalities were documented.

The neonate was referred to pediatric surgery for orchiopexy, which was planned at the age of 6 months. The pediatric surgeon decided on a sub-dartos orchiopexy technique with a right inguinal incision for the mobilization of the testis and spermatic cord. Intra-operative findings were in keeping with radiologically, suggested a diagnosis of ectopic right testis, which was found to be exiting through the superficial inguinal ring and following a curvilinear path beneath the skin, between the subcutaneous plane and external oblique aponeurosis of the right antero-lateral abdominal wall. The hypoplastic and tethered gubernaculum was identified during the surgery; it was loosely adherent to the external oblique aponeurosis. The right testis and spermatic cord were adequately mobilized and placed in a surgically created small pouch between the scrotal skin and dartos muscle of the right hemiscrotum. The postoperative period remained uneventful, as were the follow-up visits.

Discussion

The hypotheses of Tails of Lockwood as traction theory (Charles Barrett Lockwood, 1888) explained the mechanism of testicular

ectopia as the contraction of gubernaculum fibers spreading away from the normal descent pathway of the testes. However, later studies by other authors proved that the gubernaculum is initially attached to the scrotum with no fibers spreading in multiple directions [4].

The first reported case of ectopic testis in the anterior abdominal wall was of a 3-year-old boy with an empty left scrotal sac. However, a small subcutaneous swelling at the left iliac fossa was palpable somewhere between the umbilicus and anterior superior iliac spine. The swelling was provisionally labelled as neurofibroma. The child underwent surgical exploration for this swelling and it turned out to be an ectopic left testis in the anterior abdominal wall, with spermatic cord coming out of the external ring, taking a U-turn to the left side and extending upwards into the abdominal wall's subcutaneous plane between external oblique aponeurosis and fascia [5].

The second case was of a 6-month-old male infant with a reducible bulge in the left lower abdomen between lumbar and iliac fossae, suggesting a spigelian hernia. Ultrasound revealed the presence of the left testis in the sac, with no aponeurotic or muscular defect in the anterior abdominal wall. During surgery, a large hernia sac containing the left testis was found at the deep inguinal ring, extending upwards to the subcutaneous plane of the anterior abdominal wall [6].

Recently, a 2-month-old boy was reported with empty right scrotum and a small painless oval swelling in the right groin area, infero-medial to the right anterior superior iliac spine. Clinical suspicion of right ectopic testis was confirmed on ultrasound.

During surgery the right testis was located near the anterior superior iliac spine, with a tethered gubernaculum reaching the external oblique muscular fascia [7].

Other than slight variation in the location of testicular ectopia in the anterior abdominal wall, the pattern and path was similar in our case and the other cases in the literature. However, our case also had congenital heart disease and club feet, which we could not find as an association with ectopic testis in the literature to date. A combination of various congenital abnormalities is grouped under 13 q depletion syndrome [8], in which atrial septal defect, club feet, and undescended testis (rather than ectopic testis) are documented. In our case, we could not appreciate any flank swelling, is possibly due to the small testicular size at the 3rd day of life. We performed

ultrasound followed by MRI to roadmap the path of the ectopic testis preoperatively.

Conclusions

Preoperative imaging is recommended to detect and confirm the ectopic site as well as the morphology of the testis, thereby increasing the chance of surveillance and preservation of an ectopic testis. Imaging can serve as pre-operative road mapping to localize the exact site for surgical exploration of an ectopic testis if there is no apparent or palpable swelling over the anterior abdominal wall. Imaging can also exclude the possibility of a hernia by delineating the muscular morphology of the anterior abdominal wall.

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