Sonographic imaging of appendix testis and appendix epididymis

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ABSTRACT

Objectives: To determine the locations, frequency and sonographic appearances of testicular appendages.

Method: Scrotal ultrasound images of 95 consecutive patients presenting to the Riyadh Armed Forces Hospital reviewed retrospectively.

Results: The appendix testis was identified in 45.7% of testes examined and the appendix epididymis in 9.1% of testes examined. Both appendices testis and epididymis were visualized in the same testes in 6 patients. Majority of the appendix testes were located in the groove between the epididymal head and superior pole of the testis whilst the appendix epididymis were found on the epididymal heads.

Conclusion: We have described the ultrasound appearances of these testicular appendages highlighting their potential as a cause of intrascrotal pain when they tort. We have also presented their frequency of distribution and locations, and noted that they are often overlooked during testicular ultrasound.

Keywords: Sonographic imaging, ultrasound, appendix testis, appendix epididymis.


In the early stages of embryological development (Fig 1) the mesonephros drains urine into the mesonephric duct and the gonad develops in the retroperitoneum between the mesonephros and the paramesonephric duct. Later, the mesonephros disappears but its duct persists developing into the epididymis. Some mesonephric tubules persist, forming the vasa efferentia to carry spermatozoa from the testis to the epididymis. Above the epididymis, a blind ending vestige of a mesonephric tubule - the vas aberrans superior, forms the appendix of the epididymis.1,2 The remnant of the paramesonephric (Wolfian) duct in the upper pole of the testis forms the appendix of the testis. Each hemiscrotum contains the testis, epididymis and the intrascrotal part of the spermatic cord. The appendix testis is reported to be present on approximately 92% of testes whilst the appendix epididymis is present on 23% to 34% of testes.3

The appendix testis is most commonly located in the groove between the testis and epididymal head or the superior testicular pole whilst the appendix epididymis projects from the epididymal head or the superior testicular pole whilst the appendix epididymis projects from the epididymal head at variable sites.2,4 With improvement in resolution of new generation ultrasound scanners, it has become apparent that these appendages can be recognised. This is important in that torsion of the appendages is a cause of scrotal pain and it clinically mimics testicular torsion.4,5

There is only one report on the incidence and appearance on ultrasound of testicular appendages in the medical literature.

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Received October 1997. Accepted for publication in final form December 1997.

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Patients and methods. Testicular ultrasound images performed on 95 consecutive patients at the Riyadh Armed Forces Hospital over a seven month period from Sept 1996 to April 1997 were reviewed retrospectively. A total of 189 testes were examined, as one patient had a solitary testis. The epididymal head or supra testicular space were not imaged in 7 patients (14 testes), and these cases were excluded from the study. Thus 175 testes in 88 patients were reviewed. The ages ranged from 6 years to 80 years. The examinations were all performed on either a LOGIC 700 (GE Medical Systems, Milwaukee) or ACUSON 128XP/10 (ACUSON, California) scanner using a high frequency linear array transducer (5 or 7.5MHz), with grey scale and colour Doppler facilities.

Results. The appendix testis was identified in 80 of the 175 testes (45.7%), 56 (32%) of which were located in the groove between the epididymal head and the testis whilst 24 (13.7%) were located on the superior pole of the testes. The appendix testis was found to be present bilaterally in 26 patients (29.5%). It was found only on the right in 10 patients (5.7%), and on the left in 18 patients (10.3%). There were 3 cases each of calcified and cystic appendix testis (Figs 2 & 3). The appendix epididymis was identified on 16 testes (9.1%), and it was present bilaterally in 3 patients (3.4%). Both appendix testis and epididymis were visualised on the same testis in 6 patients. (6.8%).

Discussion. Ultrasound is the most sensitive imaging method available for demonstration of scrotal contents. Other workers state that it is the first and only imaging examination necessary to evaluate scrotal contents.

With recent improvement in diagnostic ultrasound technology, it is now possible to image small structures which were hitherto not clearly demonstrable. Recognition of the testicular appendages as normal structures and their variable appearances and locations are important to the sonographer. They are often not readily identified, particularly if there is no hydrocele, and a thorough search may be necessary. Visualization of the appendages was facilitated by small amount of fluid within the tunica vaginalis whilst large cysts or grossly inflamed and swollen epididymal heads tended to compress and obscure the appendages. Johnson et al identified appendix testis on 80% and appendix epididymis on 6% of testes examined. Our appendix epididymis detection rate is comparable to theirs but the lower detection rate of 45.7% for appendix testis in our study may be related to less thorough imaging of the grooves between the epididymal heads and superior aspect of the testes compared with meticulous scanning and imaging of this area in a prospective study.
The majority of appendix testes in our study were located in the angle between the head of the epididymis and the superior surface of the testes (Fig 2), whilst the remainder were located on the superior pole of the testes (Fig 4). The majority were oval or round in shape but there were a few delta-shaped and pedunculated testicular appendices. The appendix epididymis were either stalk-like (pedunculated) or oval in shape, and they were variably located on the head of the epididymis. (Fig 5). The appendix testis was described as a sessile cyst 2 or 3 mm in diameter, but Johnson et al reported the average (largest) diameter of both appendix testis and epididymis to be 4.4mm. The appendages are generally isoechoic with the testis.

The most common indications for scrotal ultrasound are evaluation of scrotal masses and acute scrotal pain. Torsion of the testis is a cause of acute scrotal pain which must be diagnosed quickly, with surgical intervention within 5 to 6 hours of onset of pain if the testicle is to be salvaged. Pedunculated testicular appendices are most likely to tort, and they cause acute scrotal pain which mimics testicular torsion. The majority occur between the ages of 10 and 13 years, and may be precipitated by injury or exercise. Appenicular torsion is relatively rare after the second decade, possibly as a result of local fibrosis. Unfortunately, apart from similar clinical presentation, testicular torsion occurs most commonly between the ages of 10 and 25 years. Torsion of the appendix epididymis is much less common than that of appendix testis. Most advocate emergency excision of the torted appendix but the situation does not result in a grave outcome, and conservative management invariably leads to eventual resolution.

With ultrasound, torsion of the appendix is seen as a hypoechoic mass between the epididymal head and superior pole of the testis surrounded by an echogenic rim. On colour Doppler imaging, the hypoechoic mass is surrounded by an area of increased perfusion, which may extend into a swollen epididymal head representing inflammatory reaction to the torted appendix. There is normal perfusion within the testis, thus excluding testicular torsion.

In conclusion, the embryological development and imaging anatomy of appendices of the testis and epididymis have been presented. We have documented the frequency of distribution and various locations of these normal structures. Examination of testicular appendages is often ignored during testicular ultrasound, and these structures should be sought in every scrotal ultrasound examination. The possibility of appendicular torsion as a cause of acute scrotal pain, particularly in the younger patient has been emphasized, and the ultrasound picture described.

Acknowledgments. We are grateful to Mrs Sharan Fergie for her help in compiling the list of patients and Mrs Pauline Cannon for typing the manuscript.

References