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## Case Repo

# Bilateral Ductal Ectasia of the Rete Testis: A Case Report and Literature Review

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### Abstract

A 58-year-old male presented to the emergency department with right scrotal pain and swelling. The patient's past medical history of epididymitis was unraveled. A multiplanar grayscale sonogram with Doppler scan of the scrotum and intra-testicular arterial pulse waveform was performed which demonstrated features of tubular ectasia of the rete testis. There was increased flow at the epididymal head which prompted the possibility of an inflammatory process consequently antibiotic therapy was administered. Tubular ectasia of the rete testis is a benign condition usually found incidentally, it has a prevalence of 1.64% in the population. This condition can be associated with a history of trauma, surgery, and inflammatory or infectious conditions. In case there is a suspicion of malignant etiology, magnetic resonance imaging (MRI) is used for better tissue differentiation.

Keywords: Scrotal pain; Doppler scan; Epididymal head; Testes

## **Case Report**

A 58-year-old male presented to the emergency department with right scrotal pain and swelling. The pain was severe, gradually progressive, radiated to the groin, and worsened with touch and movement. There was associated bilateral scrotal swelling and dysuria without fever, rash, or penile discharge. Our patient reported recurrent similar but less severe symptoms, as well as a history of epididymitis two years before presentation. A multiplanar grayscale ultrasound with color Doppler of the scrotum and intra-testicular arterial pulse wave was performed, which demonstrated normal homogenous echotexture bilaterally with no evidence of intra-testicular masses. Both testes demonstrated grossly symmetric color Doppler flow with normal intra-testicular arterial waveforms. A small anechoic left epididymal head cyst without evidence of a hydrocele was visualized (Figures 1 and 2). There were right and left tubular anechoic lesions located at the mediastinum testis, more prominent on the right, consistent with tubular ectasia of the rete testes. The right epididymal head demonstrated asymmetric increased color Doppler flow compared to the left, consistent with an inflammatory or infectious process. Subsequently, the patient was treated for infectious epididymitis.

#### **Discussion and Conclusion**

Tubular ectasia of the rete testis (TERT) is a benign condition found incidentally during testicular ultrasonography. Multiple small elliptically shaped anechoic lesions located peripherally, at the mediastinum of the testis, is demonstrated. It occurs due to the enlargement of the rete testis canaliculi. Clinically, these cystic changes are not palpable, but patients with this condition may present with scrotal swelling and enlargement especially with associated spermatoceles. Additionally, they show no signs of blood flow on Doppler scan. TERT is bilateral in almost one-third of all cases and most have associated epididymal pathologies such as epididymitis and epididymal cysts [1-6].

The prevalence of cystic transformation of the rete testis to tubular ectasia was found to be 1.64% (n=38) in a study by Nistal et al. [6]. This study included testicular and epididymal specimens acquired from 2316 men, the majority from autopsies (n=1,798) and the rest from surgery (n=518). Testicular cysts which include a wide range of differentials, one of which is TERT, has a prevalence of 10% according to Gooding et al. [7].

The flow of sperm starts at the seminiferous tubules which join to form lobules. Each lobule encompasses several hundred seminiferous tubules which assemble to form the straight tubules. The straight tubules converge together forming the rete testis. From the rete testis, efferent ductules extend and merge to form the head of the epididymis. The epididymis has a head, body, and tail through which the sperm travel toward the vas-deferens and onward to the external genital tract (Figure 3) [3].

Obstruction or stenosis within the previously described tubular pathway could potentially lead to the development of tubular ectasia of the rete testis. The cystic transformation of rete testis is speculated to take place due to the consequent back pressure following obstruction or stenosis. The most common locations for obstruction includes the efferent ducts, testis epididymis junction, and within the epididymis [4,6]. The major underlying causes of obstruction or stenosis leading to TERT, are classified into mechanical compression of extratesticular excretory ducts, congenital malformation such as testis-epididymis dissociation, arterial lesions causing ischemic epididymal atrophy, and hormonal abnormalities such as androgen-estrogen imbalance which leads to atrophy of the epididymis due to its dependence on androgens [6]. Moreover, certain associations are linked to TERT, such as a history of trauma, surgeries such as previous vasectomy and hernia repair, and post inflammatory alterations such as in epididymitis similar to the presented patient [3,4].

On ultrasound, TERT demonstrates the presence of anechoic cystic spaces characterized by branching patterns, which are peripherally located within the mediastinum testis. These cystic lesions have no solid component and clinically are not palpable. They usually present at a median age of 62. The classic associated features of this condition help avoid unnecessary procedures and surgeries. On the other hand,

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Figure 2: (A) Bilateral transverse grayscale ultrasound view of the right and left testis demonstrating multiple small anechoic lesions bilaterally, and (B) color Doppler showing the lack of blood flow within the anechoic lesions

features suspicious for malignant lesions such as palpable testicular masses, cystic lesions associated with a solid mass, and presentation at a younger age, prompt further workup [2-5]. Magnetic resonance

imaging is used when in doubt, due to its precise tissue differentiation, which helps in confirming or excluding other differentials [1]. On T1 and proton-density-weighted images, tubular ectasia of the rete testis

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Figure 3: This is an illustration of the testes depicting the direction of flow undertaken by sperms through the testicular tubular pathway starting from the seminiferous tubules. The arrows arising from the seminiferous tubules represent the straight tubules which converge to form the rete testis. Extending from the rete testis are the efferent ductules which merge to form the head of epididymis. From the epididymal head the flow continues through its body and tail reaching ductus (vas) deference onward to the external genital tract.

Etiology	Obstruction or stenosis possibly owing to mechanical compression, congenital malformation, hormonal abnormalities, or ischemic atrophy [6]
Prevalence	1.64% of 2316 men have TERT [6]
Gender ratio	N/A Male organ condition
Age predilection	60 years, range from 31-76 years [2]
Risk factors	Infections, surgeries, trauma [4]
Treatment	No treatment required
Prognosis	Benign condition
Findings on imaging	Multiple tubular anechoic cystic lesions, with lack of blood flow on color doppler [1]

Table 1: Summaries the presentation of benign ductal ectasia of the rete testis.

demonstrates homogenous signal intensity lower than that of the testis. On T2-weighted images, it could be indistinguishable from the testis. Following IV gadolinium administration, ductal ectasia of the rete testis normally does not enhance (Table 1) [5].

The differential diagnosis of TERT includes benign and malignant conditions. Benign conditions include cystic dysplasia, testicular epidermoid cysts, simple testicular cysts, tunica albuginea cysts, and intra-testicular varicoceles. Malignant conditions which mimic TERT on imaging mainly include mature cystic teratomas, papillary adenocarcinomas of the rete testis, and metastatic tumors within the ducts of the epididymis (Table 2) [1,8-15].

In conclusion tubular ectasia of the rete testis is a benign condition easily identifiable using ultrasonography which demonstrates its characteristic benign cystic features. This avoids unnecessary invasive

Benign conditions	
A condition suspected to be of congenital etiology due to its frequent presentation in children and association with genitourinary anomalies. Ultrasound demonstrates numerous anechoic lesions located centrally at the mediastinum testis.	
It is the most common benign intra-testicular tumor they usually present with asymptomatic testicular enlargement. May demonstrate heterogeneous internal echo-texture, as well as, target appearance due to the viscous cystic content causing weak echo reflexes.	
Solitary cyst appear on ultrasonography as round anechoic lesion with a surrounding echoic margin, its size ranges between 0.2-2.0 cm.	
A benign mass usually solitary with a size ranges between 5-8mm. This lesion is palpable regardless of its size. Ultrasound demonstrates anechoic lesion with a thin margin. This condition is the most common cause extra-testicular benign mass.	
A condition characterized by dilated intra-testicular veins around the mediastinum testis, ultrasound demonstrates multiple anechoic lesions. Doppler scan shows abnormal blood flow within the lesion.	
Malignant Conditions	
It is a malignant condition with variable appearances on ultrasound ranging from cystic, multicystic, to solid cystic. The mature cystic teratoma may have similar appearance to that of tubular ectasia of rete testis. It can also contain calcifications, diffused or localized. Doppler scan may demonstrate blood flow. If suspected MRI and surgical exploration are indicated.	
It is a malignant condition arises from the intra-testicular excretory ducts. It could present as solid or cystic lesion, and should be included as a differential of cystic intra-testicular masses.	

 Table 2: A differential diagnosis table for benign and malignant conditions which have a similar presentation to ductal ectasia of rete testis.

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procedures and/or surgical interventions. When in doubt, magnetic resonance imaging is used for further evaluation.

#### **Conflict of Interest**

As per our local Institutional Review Board ("IRB") guidelines there are no restrictions to publish case reports as long as patient information are kept confidential. Therefore, since there are no identifiers to patient's identity our case report falls within the confines of appropriate ethical conduct.

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