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Olgu Sunumu / Case Report

Abnormally Rotated Undescended Testis in an Adult

Anormal İnmemiş Testis Tespit Edilen Bir Yetişkin Hasta

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ABSTRACT

Normally testis is developed in the abdomen and descends in to the designated scrotal sac at the time of birth or within one or two years after birth. Several factors are associated with proper descent of the testis. Failure to descend, may lead to undescended testis or cryptorchidism. In the present case, we found an undescended testis partly in the inguinal canal and partly in the abdomen in a 71-year-old male cadaver. The epididymis descended first and its major portion was outside the superficial inguinal ring. The rest of the flattened epididymis was found inside the canal attached to the upper tapered pole of the testis and the vas deferens was found arising from this portion. The testicular vessels traversing through the deep inguinal ring then entered the postero-lateral portion of the tapered portion of the testis within the canal. No torsion and necrotic changes were observed in the undescended testis. Histological examination revealed a normal pattern in the epididymis which was outside the canal and a primitive duct system in the part of the epididymis within the canal. However, the entire testis showed only non-canalized smaller seminiferous tubules with very few cellular components and large inter-tubular spaces. The most common problems associated with such undescended testes are altered fertility, testicular cancer, inguinal hernia and testicular torsion with necrosis. Therefore, identifying the condition, evaluating the associated syndromes, proper diagnosis and therapeutic strategies are very important to prevent the adverse consequences mentioned above.

Key Words: Undescended testis, epididymis, inguinal canal, cryptorchidism, testicular torsion.

ÖZET

Normalde testis abdomende gelişir ve doğum sırasında yada 1 veya 2 yıl içinde skrotal kese içine iner. Farklı faktörler testisin inmesi ile ilişkilendirilir. İnmede meydana gelen hata inmemiş testise veya kriptorşidizme neden olabilir. Sunulan bu vakada, 71 yaşında ki erkek bir kadavrada kısmen abdomende ve inguinal kanalda inmemiş testisini tespit ettik. İlk olarak inen epididimis ve onun büyük parçası yüzeysel inguinal halkanın dışında idi. Derin inguinal halkalar boyunca ilerleyen testiküler damarlar kanal içinde testisin konik kısmının postero-lateral kısmına dahil oldu. Bükülme (torsiyon) veya nekrotik değişimler inmemiş testiste gözlendi. Histolojik inceleme, kanal içinde epididimis kısmında birincil kanal sisteminde ve kanalın dışında olan epididimiste normal görüntüyü ortaya çıkardı ancak; tüm testis incelemeleri, sadece büyük inter-tübüler boşluklar ve hücresel yapılar ile kanalize olmayan küçük seminifer tübülleri ortaya çıkardı. Bunun gibi inmemiş testis ile ilişkili en yaygın problemler fertilite, testiküler kanser, inguinal hernia ve nekroz ile testiküler torsiyondur. Dolayısıyla; bu durumların doğru tespiti, ilişkili sendromların uygun teşhis ve tedavisel stratejileri yukarıda bahsedilen olumsuz sonuçları önlemede oldukça önemlidir.

Anahtar Kelimeler: İnmemiş testis, epididimis, inguinal kanal, kriptorşizm, testiküler torsiyon.

INTRODUCTION

Testes, a pair of male gonads develops in the posterior abdominal cavity in the early fetal life. It is always maintained at a lower temperature than that in the abdomen, and exposure to body temperature causes degeneration of germ cells leading to infertility[1]. Therefore the testis descends into the scrotal sac and is thus placed outside the abdominal cavity. In about 90.5% of the cases they are in the abdomen until 23rd week and then start migrating down to the scrotum at around 28th week. During this migration, occasionally, the testes may be localized in the abdomen itself, at the inner opening of the inguinal canal, in the canal or between the external opening of the inguinal canal and the scrotum[2]. Such a variation, commonly termed as cryptorchidism is a congenital anomaly seen in about 2-5 % of full term infants. The abdominal positioning of cryptorchid testis is associated with disruption of germinal epithelium, accumulation of lipid in sertoli cells, local dilations of the intercellular spaces between sertoli cell junctions and modifications in the interstitial tissue[1].

The epididymis was hypothesized as a major regulatory factor during such descent of the testes into the scrotum which is evident by the fact that, epididymal anomalies are present in more than 50% of the undescended testes[2].

Cryptorchidism is commonly associated with altered fertility, testicular neoplasm, inguinal hernia and testicular torsion with necrosis. Therefore, the condition has to be identified well in advance, and proper diagnosis and therapeutic strategies are to be suggested.

CASE REPORT

In a 71-year-old male cadaver, the left testis was found partially in the inguinal canal and partially in the abdominal cavity near the deep inguinal ring.

His left scrotal sac was of comparable size to that of right side but was occupied by a liquid filled processes vaginalis as a closed sac without any continuity with the peritoneal cavity through the inguinal canal. Further dissection of the inguinal canal revealed a protruded major portion of the epididymis through the superficial inguinal ring. Deep to the superficial ring, in the canal, we found a firm connective tissue connection between the tapered upper pole of the testes and the rest of the epididymis (Figure 1). Normally the lower pole of the testis descends first through the canal. However, in the present case, the abnormally rotated testis with its upper pole and the epididymis was heading first through the canal. On the left side, inguinal canal measured only about 2 cm in length and contained mainly a part of the epididymis, tapered portion of the testis, the testicular vessels entering the testis through its postero-lateral border (Figure 1). The vas deferens was found arising from the flattened portion of the epididymis within the inguinal canal distal to the upper tapered pole of the testis.

The broad lower pole of the testes was stuck near the deep inguinal ring projecting in to the abdominal cavity (Figure 2). This undescended testis on the left side was measuring about 3cm in length from its tapered upper pole to broad lower pole. Near the lower pole it was 2cm in breadth and 2cm in antero-posterior diameter. However, the right testis was normal.

Further histological examinations revealed that, the coils of the epididymis outside the superficial inguinal canal was fully developed and almost had a normal histological architecture. However, the part of the epididymis within the canal closer to the testis showed only canals with very thin layer of epithelium lining them and inter-tubular spaces filled with dense irregular connective tissue.

Histology of the undescended testes was grossly different from that of the normal descended

testis. Left undescended testis showed solid cords of seminiferous tubules with smaller diameters and larger intertubular spaces (Figure 4b). However, the right descended testis showed, normal cellular architecture, with distinct seminiferous tubules and all types of cellular components (Figure 4a). Since this cadaver was about 2-year- old fixed with formalin, there was some deterioration of the normal pattern of the seminiferous tubules such as non-attachment of aggregated cellular components to its wall (Figure 5a).

Only few tubules showed canalization. In addition, the cellular components were very less and we could not differentiate the cell types in the tubule. We observed only flattened scattered cells near the wall of the each tubule. (Figure5b).

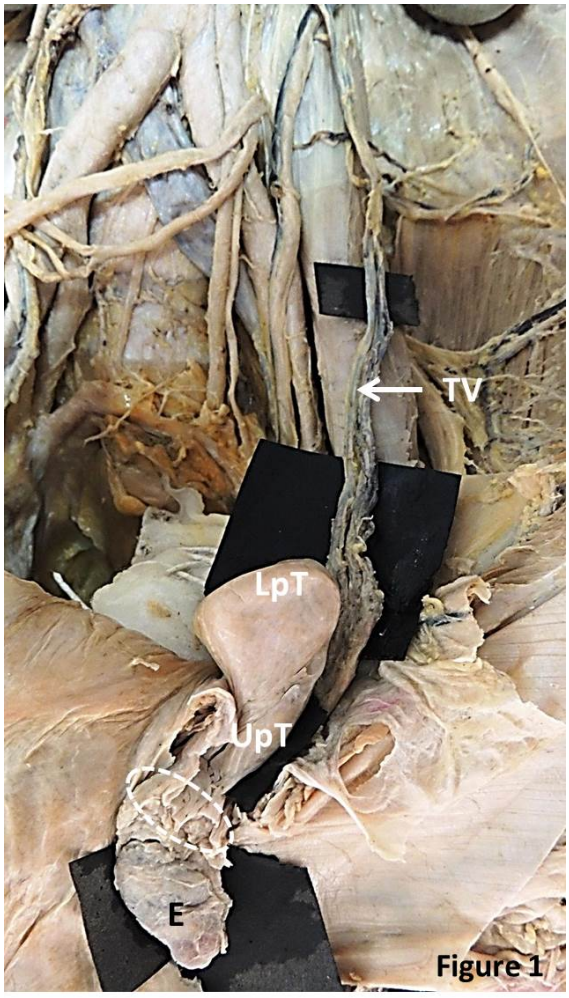

Figure1. On the left side, showing the epididymis (E) protruding through the superficial inguinal ring. The abnormally rotated testis with its upper pole (UpT) and the epididymis was heading first through the canal. The inguinal canal measured only about 2 cm in length and contained mainly a part of the epididymis, tapered portion of the testis, the testicular vessels (TV) entering the testis through its postero-lateral border and the vas deferens (Figure 1).

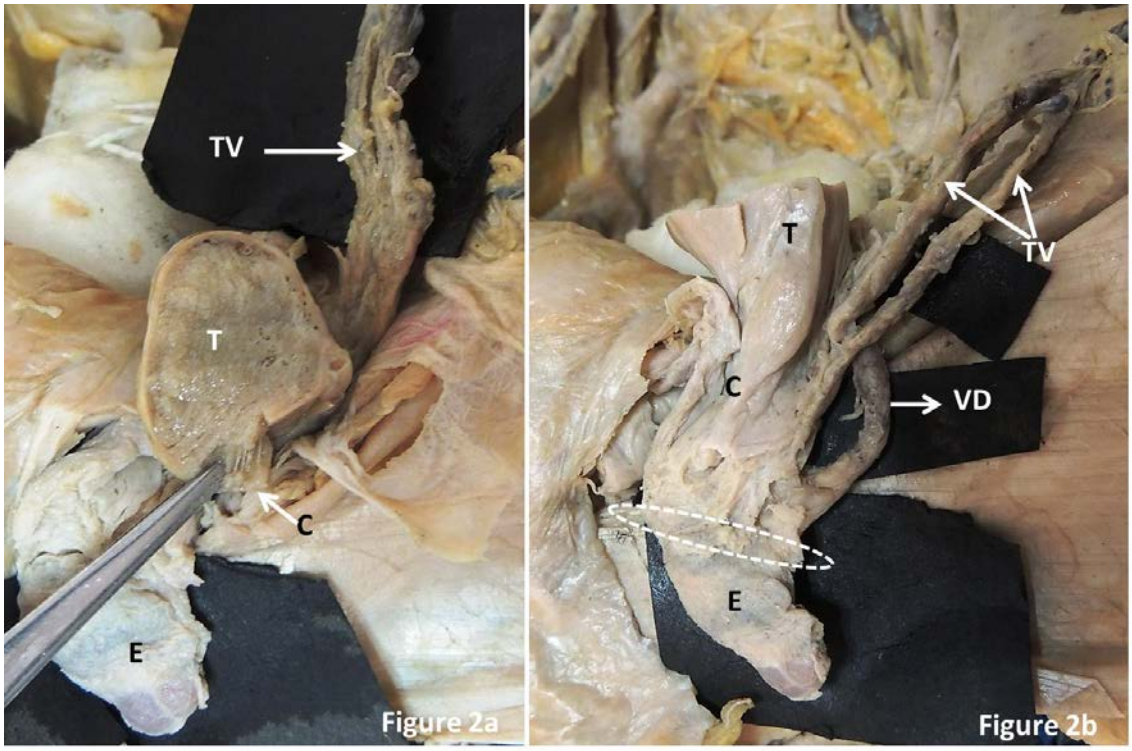

Figure2a &2b. Showing the rest of the flattened epididymis inside the canal being attached to the upper tapered pole of the testis by a firm connective tissue connection (C). The broad lower pole of the testes (LpT) was stuck near the deep inguinal ring projecting in to the abdominal cavity. No torsion and necrotic changes were observed in the undescended testis. The vas deferens (VD) was found arising from the flattened portion of the epididymis within the inguinal canal distal to the upper tapered pole of the testis.

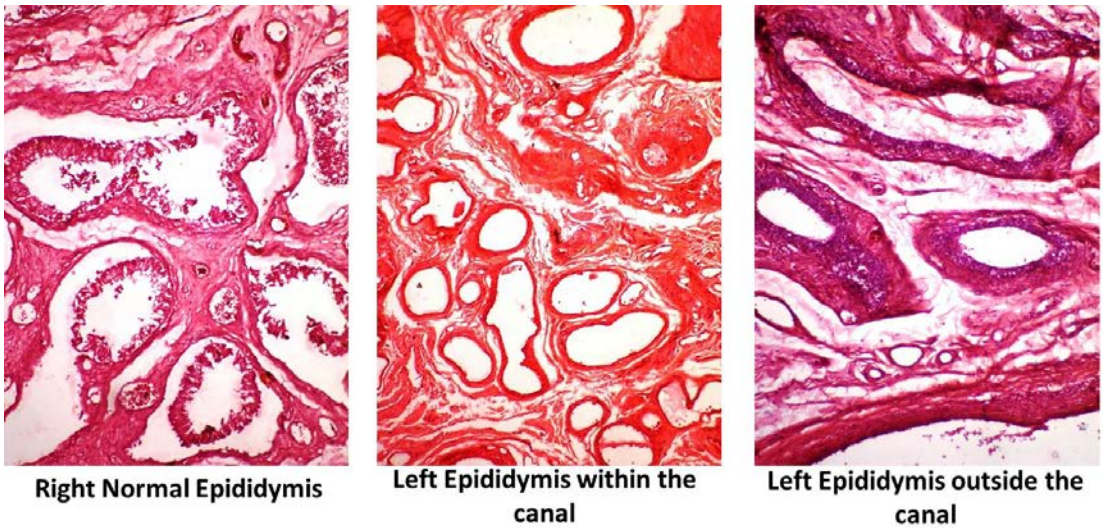

Figure 3. Histological comparison of the epididymis between the normal right (3a) and undescended left testis. This revealed a normal pattern in the epididymis which was outside the canal (3b) and a primitive duct system was observed in the part of the epididymis within the canal (3c).

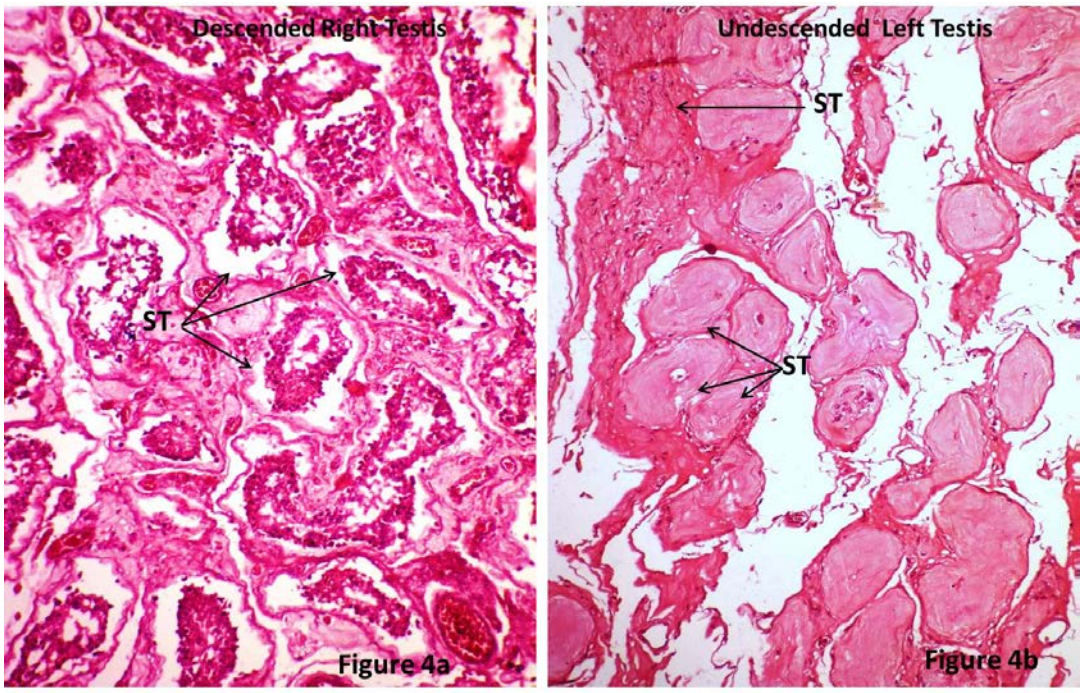

Figure 4. Showing the histology of the undescended testes grossly different from that of the normal descended testis. Left undescended testis showed solid cords of seminiferous tubules (ST) with smaller diameters and larger intertubular spaces (Figure 4b). However, the right descended testis showed, normal cellular architecture, with distinct seminiferous tubules with all types of cellular components (Figure 4a).

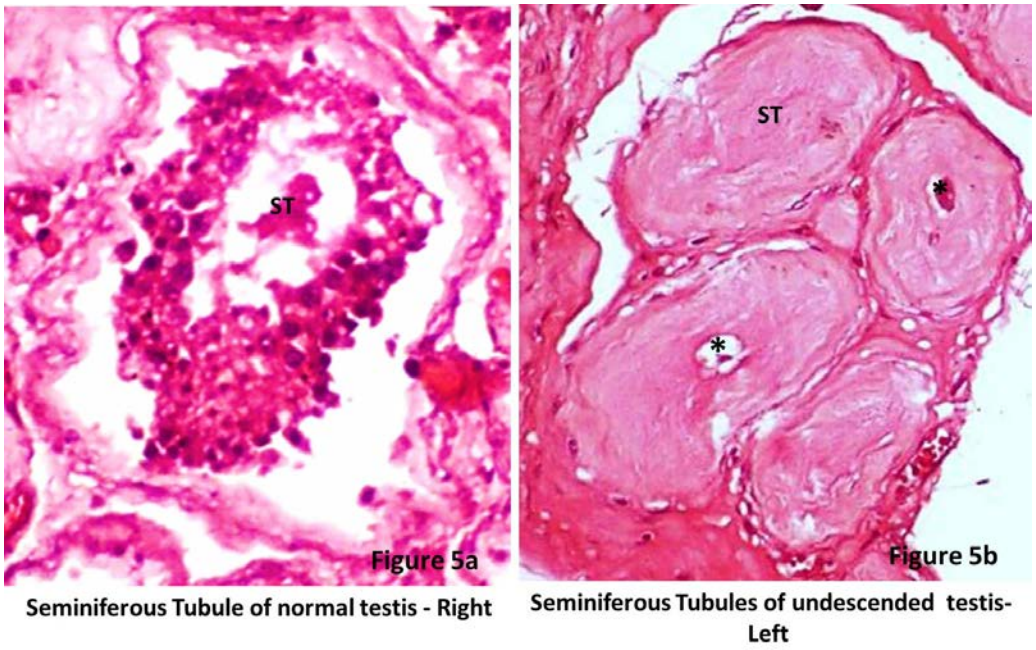

Figure 5. Showing the seminiferous tubules (ST) of the normal right (5a) and the left undescended testis (5b).
*- few tubules showing canalization

DISCUSSION

Cryptorchidism occurs when the descent of the testis into the scrotum is inhibited anywhere along its normal pathway. Independent of race and geographical region, cryptorchidism represents one of the most common disorders of childhood. The present case is of a 71-year-old individual whose left testis was found partially in the inguinal canal and partially in the abdominal cavity near the deep inguinal ring.

Many times, the undescended testis in the inguinal canal may not be noticed, especially in individuals from the rural areas without advanced hospital facilities. However, differential diagnosis at the inguinal region is very important because of the possibility of metastasis at this level in cancer patients ongoing PET imaging for detection of metastases[3]. It is important to distinguish between presence of metastatic tumor, undescended testis and active large lymph nodes in the inguinal canal.

Recently, it has been shown that, one third of boys with a unilateral palpable undescended testis had a contralateral patent processus vaginalis. Further, such presence of processus vaginalis was higher if the undescended testis was distal to the external ring[4]. However, in the present case, we did not observe any such persistant process vaginalis in the right side.

Earlier it was found that, in cases of undescended testis, in about 0.69%, epididymis was absent. It was attached to the testis only at the head and tail locations in 61.53% of cases and was totally attached to the testis in 37.76% of cases. Interestingly, it was shown that in case of absence of epididymis, testis did not descend from its embryonic position[5]. However, in the present case, the most of the parts of the epididymis was closer to the upper pole of the testis and more than half of proximal part of the testis towards the lower pole was free from the attachment of epididymis.

Epididymal nonfusion to the testis though a major regulatory factor was found to be not co-related with abnormal germ cells per seminiferous tubule or adult dark spermatogonia per tubule in undescended testes. Thus this parameter was not a significant predictor for future fertility in those individuals[6]. However, in the present case where epididymis was attached only to the upper pole, the testis showed tubular hypoplasia and non-canalization in the undescended testis.

Several studies have been performed to evaluate the ultra-structure of the undescended testis after birth. Increased degeneration of germ cells can be observed in undescended testis after the first year which progressively increases, and therefore early treatment is recommended[7].

Present type of histological pattern of testis where small tubules with no canalization and with very less cellular components did not fit in to any type of classifications made by the Nistal and his coworkers in 1980[8].

The undescended testis was found to show atropic changes in a study by Sahin and his co-worker in 2011[5]. However, in the present case, part of the testes within the inguinal canal was narrower and did not show any different histological changes than the part of the testes in the abdominal cavity near the deep inguinal ring.

Despite surgical treatment, in most of the formerly cryptorchid testes, defective differentiation of seminiferous tubules were observed and germ cell neoplasia was found in testes with retarded seminiferous tubules differentiation. Such retarded seminiferous tubules were found to have inhibited spermatogenesis, immature Sertoli cells, decreased tubular diameter, increased thickness of basal membrane and enlarged intertubular spaces. Further, even orchiopexy of cryptorchid testes failed to prevent the occurrence of testicular dysgenesis and associated germ cell neoplasia[9]. The present case also showed retarded seminiferous tubule differentiation with non-canalized tubules with very few cellular components and enlarged intertubular spaces.

However, no neoplastic changes were observed in this testis.

Men with untreated unilateral cryptorchidism are azoospermic or oligozoospermic in 50-70%. In contrast, almost all men with untreated bilateral cryptorchidism are rendered infertile. Authors have also opined that men with unilateral cryptorchidism can lead a normal life with proper development of secondary sexual characters and without malignant transformation in the undescended testis[10].

Although unilateral undescended testis does not render an individual completely infertile, however may be associated with conditions like altered fertility, testicular cancer, inguinal hernia and testicular torsion with necrosis. Therefore, identifying the condition, the site of maldescent and evaluating the associated syndromes is very important. Proper diagnosis and therapeutic strategies are to be suggested to prevent the adverse consequences mentioned above.

REFERENCES

1. Forouzan Absalan, Mansoureh Movahedin, Seyed Javad Mowla. Assessment of testis histological changes and sperm parameters in experimentally-induced unilateral and bilateral cryptorchid mouse model. Iranian Journal of Reproductive Medicine 2008;6:143-8.
2. Kirsch AJ, Escala J, Duckett JW, Smith GH, Zderic SA, Canning DA, et al. Surgical management of the nonpalpable testis: the Children's Hospital of Philadelphia experience. J Urol. 1998;159:1340-3.
3. Kara PO, Kaya B, Gedik GK, Sari O, Varoglu E. Undescended testis in inguinal canal detected incidentally on fluorodeoxyglucose PET/CT imaging. Urology. 2012;79:29-30.
4. Aggarwal H, Kogan BA, Feustel PJ. One third of patients with a unilateral palpable undescended testis have a contralateral patent processus. J Pediatr Surg. 2012;47:1711-5.
5. Sahin C, Kalkan M, Yalcinkaya S. Findings concerning testis, vas deference, and epididymis in adult cases with nonpalpable testes. Int Braz J Urol. 2011;37:727-32.
6. Kraft KH, Mucksavage P, Canning DA, Snyder HM, Kolon TF. Histological findings in patients with cryptorchidism and testis-epididymis nonfusion. J Urol. 2011;186:2045-9.
7. Iacob RE, Boia ES, Adam O et al. Undescended Testis Treatment: Personal Results versus Literature Data. Jurnalul Pediatrului. 2005;8:56-60.
8. Nistal M, Paniagua R, Díez-Pardo JA. Histologic classification of undescended testes. Hum Pathol. 1980;11:666-74.
9. Gumińska A, Slowikowska-Hilczer J, Kuzański Wet al. Features of impaired seminiferous tubule differentiation are associated with germ cell neoplasia in adult men surgically treated in childhood because of cryptorchidism. Folia Histochem Cytobiol. 2007;45:163-8.
10. Syed S A, Herekar NG. Cryptorchidism- A Case Report. International Journal of Recent Trends in Science and Technology. 2013;6:79-80.

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