Autopsy and Case Reports 2012; 2(4): 65-68

Article / Clinical Case Reports
Artigo / Relato de Caso Clínico

Testicular Regression Syndrome: a case report

Christiana de Freitas Vinhas[a], Aloísio Felipe-Silva[b], Ricardo Frank Coelho da Rocha[c]

Vinhas CF, Felipe-Silva A, Rocha RFC. Testicular Regression Syndrome: a case report. Autopsy Case Rep [Internet]. 2012;2(4):65-68. http://dx.doi.org/10.4322/acr.2012.036

ABSTRACT

Testicular Regression Syndrome (TRS) is defined as the absence or an incomplete development of the testis of varying degrees in 46XY patients with normal external genitalia. The prevalence ranges from 3-20% of cases previously diagnosed as cryptorchidism. We report the case of a 7-year-old boy who underwent surgical exploration with an initial diagnosis of cryptorchidism. Testicular structure was not identified and presumed testicular remnants were sent for histological analysis. The histological sections showed a fibrovascular nodule, structures of the spermatic cord and calcification, supporting the diagnosis of TRS.

Keywords: Cryptorchidism; Orchiopexy; Gonadal dysgenesis, 46, XY; Testis; Biopsy.

INTRODUCTION

Testicular Regression Syndrome (TRS) is defined as the partial or total absence of testicular tissue, uni- or bilateral, with or without rudimentary epididymis and spermatic cord structures in 46XY individuals with normal external genitalia.[1,2,8]

It occurs in 1 in 20,000 male live births[3] and the prevalence ranges from 3-20% of cases previously diagnosed as cryptorchidism.[2] In a case of non-palpable testis, surgical exploration is advised and orchiopexy should be done if the gonad is found. Otherwise, removal of the remaining structures for histological analysis is recommended.[1,8]

Among the histological findings, the identification of a fibrovascular nodule tissue is considered a mandatory diagnostic criterion for TRS by some authors. Other findings that reinforce the diagnosis of TRS such as structures of the spermatic cord (testicular artery, pampiniform plexus, nerves and *vas deferens*), dystrophic calcification, hemosiderin deposits and rudimentary epididymis can also be found.[1-3]

In this report we present the case of a child who underwent surgical exploration with an initial diagnosis of cryptorchidism after clinical examination.

[a] Department of Pathology – Faculdade de Medicina – Universidade de São Paulo, São Paulo/SP – Brazil.
[b] Anatomic Pathology Service – Hospital Universitário – Universidade de São Paulo, São Paulo/SP – Brazil.
[c] Department of Surgery – Hospital Universitário – Universidade de São Paulo, São Paulo/SP – Brazil.

CASE REPORT

Male patient, 7 years old, with normal external genitalia, topic right testicle and nonpalpable left testicle in the scrotum, with an initial diagnosis of cryptorchidism. The patient underwent surgical exploration, and a fragment of presumed left testicular remnants was removed and sent for histological analysis.

Grossly, the removed fragment presented a funicular aspect with an average length of 6.5 cm and a diameter of 0.7 cm, a brownish color and fibroelastic consistency. Testis-like structures were not visible however, there was a 0.5 cm slight bulging and firm thickening in the region marked with a surgical thread. The entire specimen was subjected to microscopic analysis.

The histological sections showed hypoplastic *vas deferens* (Figure 1) amid venous vascular structures similar to a rudimentary pampiniform plexus (Figure 2). There was also nerves and skeletal muscle tissue. Areas of nodular fibrosis intermingled with some vessels, foci of hyalinization (Figure 3 and 4) and focal dystrophic calcification (Figure 5) could be seen. Perls´ Prussian blue stain for hemosiderin was negative. These findings were consistent with the histological diagnostic criteria for TRS.

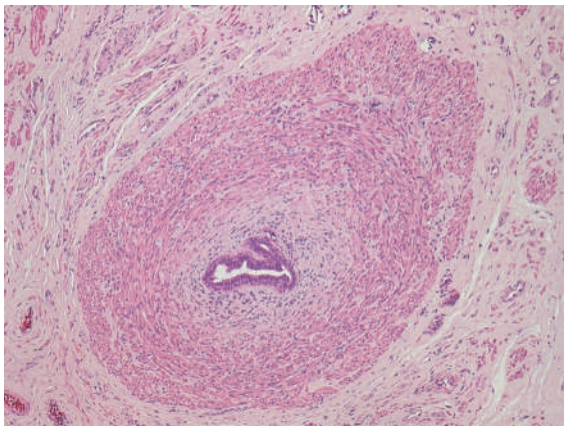

Figure 1 – Hypoplastic *vas deferens* (H&E, 100×).

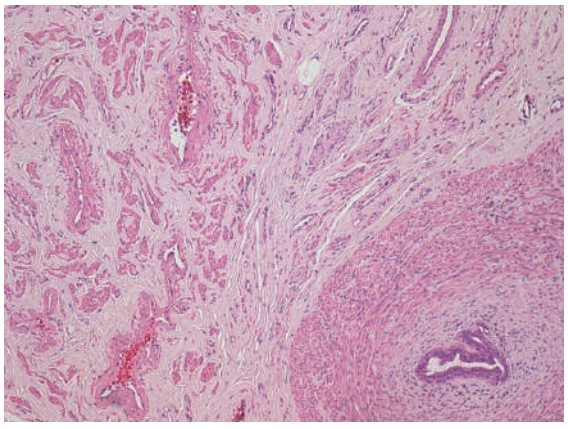

Figure 2 – Hypoplastic vas deferens amid venous structures (H&E, 100×).

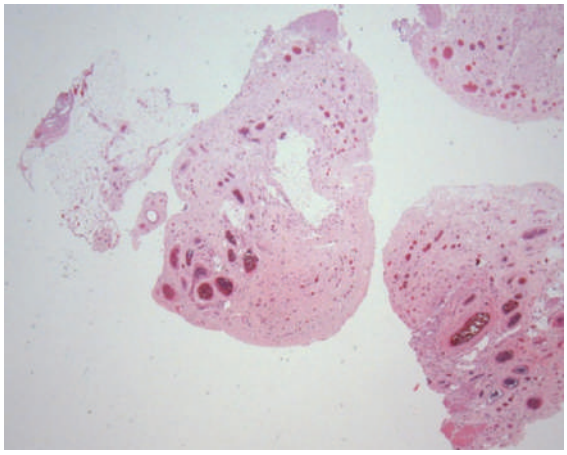

Figure 3 – Fibrovascular nodule (H&E, 25×).

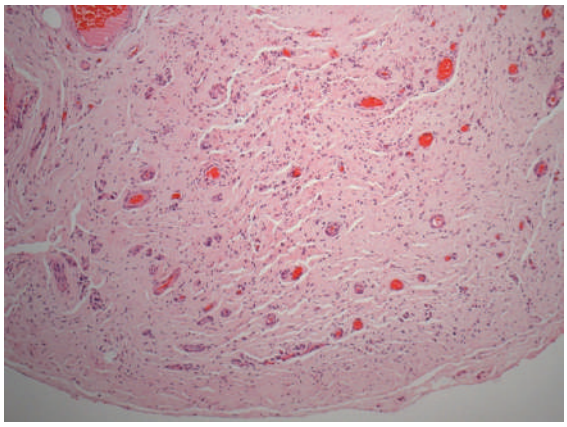

Figure 4 – Fibrovascular nodule (H&E, 100×).

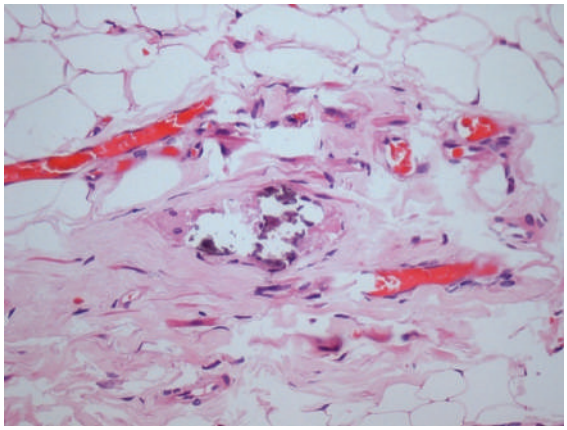

Figure 5 – Dystrophic calcification (H&E, 400×).

DISCUSSION

There is much disagreement in the literature regarding the terms used in the absence of testicular tissue in 46XY individuals. Potter[7] defines Testicular Regression Syndrome as the absence or varying degrees of incomplete development of the testis in 46XY individuals, including thus cases of testicular aplasia, gonadal dysgenesis and testicular regression at different stages of fetal development. However, other authors argue that the term TRS should not include cases of dysgenesis, despite the histological findings do not permit a distinction between these two entities. The differentiation between these terms would be based on the involvement or not of sexual development, especially the external genitalia. In cases of gonadal dysgenesis there is a serious commitment of sexual differentiation, while in cases of TRS external genitalia is normal. In the present report the child had normal external genitalia and one topic normal testicle. Histological criteria of the contralateral abnormal testicular remnants fulfilled proposed criteria for TRS, and this was the terminology at the time of pathological diagnosis.

In most studies, the frequency of this syndrome varies from 3-20% of cases clinically diagnosed as cryptorchidism.[1,2,4-7] This frequency corresponds to about one half of the truly non-palpable cryptorchid testes (approximately 20% of the total).[6]

Regarding the etiology of TRS, the theory of an ischemic event in early or late fetal stage is the most accepted because findings such as dystrophic calcification, hemosiderin deposits and giant cells corroborate this hypothesis.[5]

The common histological criteria according to different authors are blind-ending *vas deferens*, small fibrovascular nodule, calcification and hemosiderin. However, some authors consider the presence of blind-ending structures of the spermatic cord as a minimum criterion.[5] We identified the fibrovascular nodule, structures of the spermatic cord and calcification in the present case, supporting the diagnosis of TRS.

Some cases of non-palpable testis, especially on the left side, are associated with splenogonadal fusion, a rare congenital anomaly. Although it can be associated with various malformations (lower limbs, facial, cardiac, anorectal, diaphragmatic, spina bifida), cryptorchidism is the most common condition found in these cases. The diagnosis is intraoperative, and its importance lies in differentiating the splenogonadal fusion and a gonadal neoplasm, leading to unnecessary orchiectomy.[11]

As for the management of cases of nonpalpable testes on physical examination, most surgeons opt for laparoscopic exploration as the primary intervention. The laparoscopy is followed by inguinal exploration in cases where spermatic vessels and veins are seen passing through the internal inguinal ring.[5,10] Surgeons emphasize the importance of identifying the vascular supply and drainage of the gonad. This is due to the fact that the testicles may not be present in the absence of the gonadal vein once the vein and the pampiniform plexus almost always indicate the location of the testis, regardless of the presence of the *vas deferens* and epididymis. These features are not emphasized by pathologists.[1]

Surgical exploration is required to perform the orchiopexy for those cases in which the testis is present but not topic (cryptorchidism). However there is disagreement regarding the removal of the remnants structures in cases of TRS. These structures were detected in up to 11% of reported cases and among these, cellular atypia was found in up to 26%.[5,6] We found a single case report of malignant transformation of testicular remnants in a carrier or TRS.[9] Most authors believe that the removal must be performed because of the lack of data regarding the risk of malignant transformation of testicular or paratesticular remnants containing germ cells. Some authors further claim the surgical fixation of the contralateral testis in order to reduce the risk of testicular torsion and thus ensuring good chances of fertility for the patients with TRS.[2]

Brauner[3] and colleagues evaluated hormone levels and possible genetic mutations in 26 patients diagnosed with anorchia that, at birth, had at least one palpable testis in the scrotum. Low or undetectable levels of anti-Mullerian hormone and inhibin B, and high levels of FSH (hormones related to sexual differentiation) were shown in the plasma of these patients. Mutations in the NR5A1 gene (which plays a role in the gonadal development) were not detected.

Some studies show that the loss or absence of testicles can have negative psychological effects on adult men or children. Therefore, surgery for testicular prosthesis implantation is a solution that

minimizes the psychological consequences of the absence of the testicle in the scrotum, providing similarity in size, weight and appearance of natural testicle.[12]

Altogether, these data support the conclusion that this patient fulfills clinical and pathological criteria for TRS. Furthermore, one should consider the possibility of orchiopexy and testicular prosthesis implantation to minimize the risk of testicular torsion of the viable testicle and negative psychological effects.

REFERENCES

1. Spires SE, Woolums CS, Pulito AR, Spires SM. Testicular regression syndrome. a clinical and pathologic study of 11 cases. Arch Pathol Lab Med. 2000;124:694-8. PMid:10782149.

2. Smith NM, Byard RW, Bourne AJ. Testicular regression syndrome – a pathological study of 77 cases. Histopathology. 1991;19:269-72. PMid:1916702. http://dx.doi.org/10.1111/j.1365-2559.1991.tb00033.x

3. Brauner R, Neve M, Allali S, et al. Clinical, biological and genetic analysis of anorchia in 26 boys. Plos One. 2011;6:e23292. PMid:21853106 PMCid:3154292. http://dx.doi.org/10.1371/journal.pone.0023292

4. Aherne WA, Scott JES. The vanishing testis. Lancet. 1969;18:882-4.

5. Bader MI, Peeraully R, Ba'Ath M, McPartland J, Baillie C. The testicular regression syndrome – do remnants required routine excision? J Pediatr Surg. 2011;46:384-6. PMid:21292092. http://dx.doi.org/10.1016/j.jpedsurg.2010.11.018

6. Storm D, Redden T, Aguiar M, Wilkerson M, Jordan G, Sumfest J. Histologic evaluation of the testicular remnant associated with the vanishing testes syndrome: is surgical management necessary? Urology. 2007;70:1204-6. PMid:18158048. http://dx.doi.org/10.1016/j.urology.2007.08.020

7. Gilbert-Barness E, Gunasekaran S. Male reproductive system. In: Gilbert-Barness E, editor. Potter's pathology of the fetus, infant and child. 2nd ed. Philadelphia: Mosby Elsevier; 2007. p. 1416-17.

8. Nistal M, Paniagua R. Non-neoplastic diseases of the testis. In: Bostwick DG, Cheng L, editors. Urologic surgical pathology. 2nd ed. Mosby Elsevier; 2008. p. 632-5. http://dx.doi.org/10.1016/B978-0-323-01970-5.50014-2

9. Rozanski TA, Wojno KJ, Bloom DA. The remnant orchiectomy. J Urol. 1996;155:712-4. http://dx.doi.org/10.1016/S0022-5347(01)66507-8

10. El Tayeb AA. The unilateral impalpable testis: does the order of the procedure affect the outcome? Ann Pediatr Surg. 2009;5:115-8.

11. Albuquerque J, Martins AP, Gonçalves M. Fusão esplenogonadal. Acta Pediatr Port. 2010;41:135-7. Portuguese.

12. Bodiwala D, Summerton DJ, Terry TR. Testicular protheses: development and modern usage. Ann R Coll Surg Engl. 2007;89(4):349-53. PMid:17535609 PMCid:1963594. http://dx.doi.org/10.1308/003588407X183463

Conflict of interest: None

Submitted on: 12th September 2012
Accept on: 6th October 2012

Correspondence: Departamento de Patologia
Faculdade de Medicina da Universidade de São Paulo
Av. Dr. Enéas Carvalho de Aguiar, 155 – 10º andar – Cerqueira Cesar – São Paulo – SP – Brazil
E-mail: kikavinhas@yahoo.com.br