Penoscrotal Transposition: A Cadaveric Review

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ABSTRACT

INTRODUCTION

With only 20 documented cases, the congenital malformation known as complete extreme penoscrotal transposition with an intact scrotum, midline raphe, and absence of hypospadias is an extremely rare abnormality. Penoscrotal transposition occurs when the scrotum fuses above the penis for a complete abnormality or does not fuse at all for an incomplete abnormality. This failure of the scrotum to descend during development, when the genital swellings fail to descend below the penis and fuse. The irregularity has been known to follow an X-X recessive pattern of inheritance in most cases. In others it results from a defect of chromosome 13. This disease would have significant clinical implications for a patient in daily day activities, as well as sexually. However, little is known as to whether this transposition impacts spermatogenesis. Materials and Methods: Dissection and observations were made from a 72-year-old cadaver, a gross anatomy course at Philadelphia College of Osteopathic Medicine, utilizing the methods of the dissection manual. Bipolar cautery was used and without fixation fixation for light microscopy, using standard techniques. Results: Upon dissection, the individual exhibited a complete extreme penoscrotal transposition, with the scrotum fused above the penis in a sharp fashion, with no hypospadias. The tunica albuginea was thickened, fused in the midline, and adhered to the testis. Histology of the testis supports that spermatogenesis was not altered. The organization of the seminiferous tubules and developing germ cells appeared to be normal. Discussion: Along with the penoscrotal transposition, many abnormalities are typically also present. It was observed that the patient had several hernias, mega colon, and many abdominal adhesions. One interesting anomaly observed during dissection was bilateral adductor magnus/adductor longus muscles. As a senior computer analyst, this individual likely had no cognitive or mental impairment, however, his cause of death was due to end stage Parkinson’s disease. Living with a congenital abnormality has been very difficult because the patient has virtually no protection of the testes as they are positioned superior to the scrotal wall and the scrotum and therefore have been unable to address the anatomical implications for the patient, especially with regard to reproduction and sexual intercourse.

RESULTS

General observations:
- 47-year-old male; approximately 5’8’’ tall weighing approximately 170 lbs.
- Occupation: computer analyst.
- Cause of death listed as Parkinson’s Disease.
- Examination of the heart indicated the likelihood of an inferior wall myocardial infarction.
- The patient had several abdominal aches along the linea alba.
- His abdominal surgeries resulted in incisional hernias.
- He had a prior cholecystectomy.
- Megacolon beginning at the distal end of the sigmoid colon.

Perineum (Figures 1 and 2):
- Scrotum located above the penis.
- The scrotum had no direct connection to penis.
- The testes were fused to the scrotal wall by a thickened tunica albuginea.
- The thickened tunica in the midline was fused and joined both testes.
- The spermatic cord was located in the inguinal canal.
- The pampiniform plexus of veins was replaced by a singular testicular vein.
- Normal erectile tissue present in the penis.
- Histological examination of the testes revealed normal appearance of seminiferous tubules containing Sertoli cells, spermatogonia, spermatocytes and spermatids (Figure 3).

Thigh:
- Adductor magnus and adductor longus were fused bilaterally. Muscle fibers for this fused muscle were in a uniform direction.

Figure 1. The scrotum is present on the anterior abdominal wall superior to the penis (A). Testes are present within the scrotum. The tunica albuginea is thicker than normal, fused in the midline and adheres to the scrotal wall (B).

Figure 2. The testes were removed from the scrotum and spermatic cord was defined. The spermatic cord runs through the inguinal canal.

Figure 3. Light micrograph of testis containing seminiferous tubules (A), Sertoli cells, spermatogonia, spermatocytes and spermatids are present in the seminiferous tubules (B).

DISCUSSION AND CONCLUSION

The presence of penoscrotal transposition provided a unique opportunity to examine and describe the anatomy of the perineum as well as other regions. Family history for this individual was not available. The normal subpubic location of the scrotum protects the testes from physical trauma. In addition, the cremaster muscles can raise or lower the temperature to optimize spermatogenesis. The position of the scrotum on the abdominal wall may allow for a normal delivery of the testes in this person. Based on the presence of spermatogenetic in the testes and erectile tissue in the penis, it is likely that he was fertile. Multiple spermatogonial abnormalities or lesions have been found in the testes of some men.1 This is the first reported case of a bilateral fusion of the adductor magnus and adductor longus. Fusion of these muscles may have allowed the adductor magnus and adductor longus muscles.

Gastrointestinal anomalies are also associated with penoscrotal transposition. It is unclear whether this individual gastrointestinal problems were related to the penoscrotal transposition. Furthermore, cardiovascular conditions have been correlated in men with this transposition. Although there was no mention of cardiac disease in the death certificate, observations of the heart revealed the possibility that he had an infarction of the inferior wall of the heart. Unfortunately, examination of the brain was not conducted in this study. The presence of anomalies in the ventricles which have been found in some men with penoscrotal transposition, may have contributed to his developing Parkinson’s disease.2

There are surgical procedures to reposition the penis superior to the scrotum, such as the Glenn Anderson technique where incisions were made to lower the scrotum and raise the penis, as well as graft tissue from the thigh to the pubic area. This technique and several others, are fraught with complications in nearly 50% of patients, resulting in severe lymphedema.3 Anatomical observations were that the length and elasticity in the spermatic cord may have been insufficient to lower the testes and scrotum any further. Also, the patient may not have been a candidate due availability of procedures during his infancy when this is normally addressed.

The psychosocial implications of this condition have not been discussed in the literature. The individual would have greater potential for trauma to the scrotum against a counter or lying on his stomach may have been very uncomfortable. His intimate interactions would have required finding a partner who was accepting of his unique condition. This may have added an additional layer of strain to his life including depression and anxiety. However, this is difficult to assess without prior medical records. Because penoscrotal transposition is rare, there is still a lot to learn about the causes, treatment, and psychosocial needs of these individuals.

REFERENCES


METHOD

The body of a 72-year-old male was donated to the Humanity Gifts Registry of Pennsylvania. This is the anatomical board for the state of Pennsylvania that was established in 1893 by the American Society of Anatomists. Approval for the dissection was obtained from the death certificate. The body was used in fall gross anatomy courses at Philadelphia College of Osteopathic Medicine. Dissection of the abdomen and perineum was conducted with modifications following the procedures in Grant’s Dissector (Tanks 15th ed.). A biopsy of the testis was taken and processed for light microscopy using standard techniques.