Complete Androgen Insensitivity Syndrome: Successful Laparoscopic Management

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Introduction

Androgen insensitivity syndrome (AIS) is an X-linked recessive trait. The gene is located on a highly conserved region of x chromosome in the peri-centromeric region of the log arm of Xq11-12.

The prevalence of 46, XY females was 6.4 per 100,000 live born females and for AIS is 4.1 per 100,000 live born females [1].

Patients with complete androgen insensitivity syndrome are phenotypically females, but their genetic composition is that of male karyotype 46, XY. The defect lies in the x chromosome affecting the gene responsible for the

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androgen intracellular response to testosterone or dihydrotestosterone.

Case Report

This patient is a 24-year-old female, presented to us with complaint of primary amenorrhea. Detailed history revealed that she had been diagnosed with 46, XY karyotype on chromosomal analysis at the age of 7 years, when she first presented with a left inguinal at another institute. Histopathology of the biopsy taken from the left inguinal swelling showed poorly developed testicular tissue. Patient's mother had no problem in conception. The patient herself is the fourth among six sisters. Out of which three sisters have family of their own. Her younger sister, who is currently 23 years old, is also under evaluation for primary amenorrhea, diagnosed with rudimentary ovaries with a hypoplastic uterus on MRI.

On examination, her height was 165 cm, BMI 25, tanner stage 4 for breast development and tanner stage 0 for pubic and axillary hair development. Abdomen had no palpable mass or inguinal swelling. Local examination unveils a 3×3 cm mass in left inguinal region and a blind vaginal pouch of 2 cm depth.

Biochemical investigations were as follows: testosterone: 5.8 ng/dl; DHEAS: 288.3 mcg/dl; MRI mentioned absent uterus with a blind ending vaginal canal; absence of ovarian tissue and presence of oval structures in bilateral inguinal canal suggestive of testis.

The patient had been on antidepressants since 4 months before surgery was planned. She was counseled for conservative (vaginal dilators) as well as definitive (vaginoplasty) mode of management. Patient opted for vaginoplasty along with gonadectomy. Hence, we decided to proceed with prophylactic bilateral laparoscopic gonadectomy with laparoscopic Davydov's vaginoplasty (Figs. 1, 2).

Under laparoscope, the uterus and ovaries were not visualized. A cord like structure likely to be epididymis was noted running into the deep inguinal ring. Testicular tissue was pulled out through the deep inguinal ring by incising it on both sides. Neovagina was lined by pulling the posterior peritoneum into the space created from the blind vaginal pouch. The entire procedure took 2.5 h with

Fig. 1 Testicular gonad being removed from the deep inguinal ring

Fig. 2 Suturing at the posterior peritoneum done to form neovagina

minimal blood loss. Testicular tissue was confirmed on histopathology. Functional length of 11 cm was obtained after the procedure. Temporarily mold was placed in the neovagina which was removed on day 7 postoperative period after which patient was fit to be discharged.

We have 8-month follow-up with this patient. She is satisfied with the surgery. She is currently using vaginal dilators periodically and has stopped the use of antidepressants.

Discussion

Androgen insensitivity syndrome is a disease that causes resistance to activities of androgen, influencing both morphogenesis and differentiation of the body structures. Patients with CAIS typically present with swelling in inguinal region before puberty or as primary amenorrhea,

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after puberty. In our case, the patient presented to us with primary amenorrhea but she had previously presented with left inguinal swelling also.

Translocations between the chromosome sites Xq11-12 may be the cause for the demonstration of the familial tendency of AIS. Reports from the Netherlands demonstrated that 59% of androgen insensitivity patients had other affected relatives. Another study carried out on 30 families examined 22 mothers and investigated that grandmothers were heterozygous carriers. There is a 50% possibility of the affected mother to transmit AR pathogenic variant in all her pregnancies [2]. There have not been many reports or studies stating the affection of relatives with disorders of sexual development in families nurturing a child with CAIS. In our case, a positive familial affection is noted.

The timing for proceeding with gonadectomy has seen a changing trend over the past 5 decades. In the 1950s/1960s, the testes usually remained in place—often they were not discovered. In the 1970s/1980s, there was a move toward gonadectomy, early in childhood, followed by estrogen therapy. In the 1990s/2000s, the emphasis moved toward gonadectomy after puberty based on a perceived risk of tumors. The current practice is to perform gonadectomy at the time of vaginal lengthening procedures. If not, then it must be delayed until secondary sexual characters are fully developed. However, gonadectomy necessitates hormone replacement since androgen is necessary for normal bone mass and skeletal development.

The need for gonadectomy lies in the fact that there is an emerging evidence regarding the increasing risk of malignancy in these leftover gonads from puberty onward.

The changes in the remnant testicular tissue can be either benign forming hamartomas or malignant, transforming into seminoma, germinoma or gonadoblastomas. Studies suggest that the risk of gonadal malignancy is reported from 0.8 to 22%, reaching up to 33% at 50 years of age [3]. But due to insufficient data, the precise age

around which this risk is highest is not determined, and hence, the timing of gonadectomy remains in discussion.

Conclusion

CAIS is a psychologically disturbing condition, not just for the patient herself but also for her family. Laparoscopy is the preferred *modus operandi*. One must evaluate families of AIS-affected females keeping in mind that their siblings may express discordant expression of müllerian structures.

Finally, early diagnosis and its management, detailed and relevant counseling and periodic follow-ups remain the core of management of such disorders.

Compliance with Ethical Standards

Conflict of interest There is no conflict of interest between the authors.

Human and Animal Rights This case report does not involve any research work involving human or animal.

Informed Consent Informed consent for publication of this report has been obtained from the patient.

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