Cytogenetic spectrum of Ovotesticular Disorder of Sex Development in Egyptian DSD patients

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Introduction

Ovotesticular disorder of sex development **(OT-DSD)** is a rare disorder of sexual differentiation characterized by the presence of **both testicular and ovarian tissues** in the gonads of the same individual

Objective

Report on 8 patients with OT-DSD, who were referred to the Clinical Genetics and endocrinology Clinic (NRC), Cairo, Egypt.

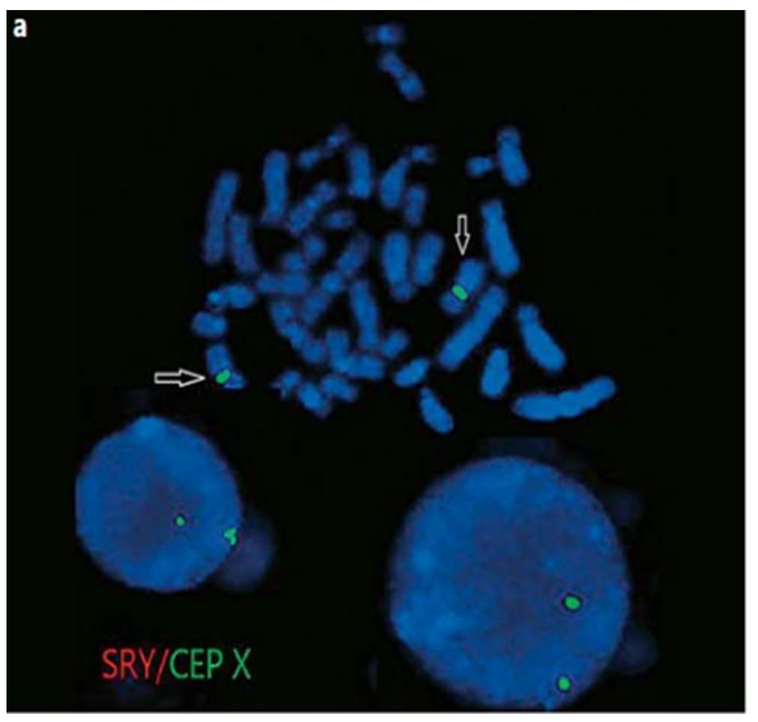
Results

- **The 8 OT-DSD patients were among 540 DSD patients studied over a period of 7 years (2010-2017):**
  - ❑ Seven patients presented with ambiguous genitalia.
  - ❑ One male patient presented with pubertal breast development.
  - ❑ OT-DSD pathological diagnosis was confirmed in all patients.

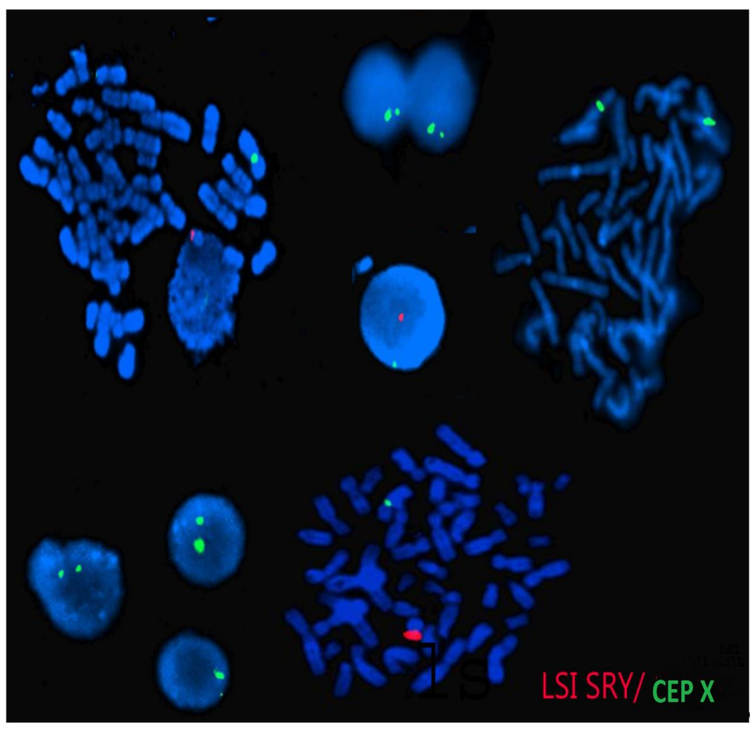
Table 1: Classification of studied patients

Age	Sex of rearing	Presentation	Laparoscopy and histopathology	Cytogenetic results
13 yr	Female	**Ambiguous genitalia**	**Right** dysgenetic testis, **Left** ovary with some follicular activity **Hypoplastic uterus**	**45,X [60]/46,X, idic(Y) (p11.32)[40]. ish idic(Y)(p11.32) (wcpY, Xp/Yp-, SRY, DYZ3)**
9 m	Female	**Ambiguous genitalia**	**Right** dysgenetic testis **Left** ovotestis and fallopian tube **Hypoplastic uterus**	**45,X[75]/46,X, idic(Y) (p11.32)[15]/ 47,X,idic(Y) (p11.32)x2[4]/ 46,XY[6] ish idic(Y)(p11.32) (wcpY, Xp/Yp-,SRY, DYZ3)**
11 yr	Male	**Gynecomastia**	**Left** ovotestis **Right** scrotal epididymal cyst **Uterus**	**mos46,X,dic(X;Y)(p22.33;p11.32)[65]/45,X[23]/45,dic (X;Y) (p22.33;p11.32)[12]. ish: t(X;Y)(p22.33;p11.32)(DXZ1+/ DYZ3+, KAL+, SHOX–, Xp–/Yp–, SRY+). nuc ish X/Ycen(DXZ1x2,DYZ3x1)(DXZ1 con DYZ3x1) [67]/ (DXZ1x1)[23]/(DXZ1x1,DYZ3x1)(DXZ1 con DYZ3) [10]**
3 yr	Female	**Ambiguous genitalia**	**Bilateral** ovotestis **Prepubertal uterus**	**46,XX. ish: (DXZ1++/DYZ3-, SRY-) nuc ish X/Ycen (DXZ1x1)[35]/ (DXZ1x2) [55]/ (DXZ1x1,DYZ3x1) [10]**
12 yr	Female	**Ambiguous genitalia**	**Left** dysgenetic testis **Right** ovotestis **Prepubertal uterus**	**46,XX. ish: (DXZ1++/DYZ3-, SRY-) nuc ish Xcen(DXZ1x2), Yp11.32 (SRY-)**
25 yr	Male	**Ambiguous genitalia**	**Left** testis **Right** small cystic ovary **Uterus**	**46, XX ish: (DXZ1++/ SRY-)**
6 m	Male	**Ambiguous genitalia**	**Left** testis **Right** ovotestis **Uterus**	**46,XY[70]/ 46, XX[30]**
3 yr	Male	**Bilateral undescended testis**	**Right** testis **Left** ovotestis **Uterus**	**46,XX ish: (DXZ1++/DYZ3-, SRY-)**

Figures: FISH analysis of Patients 4 and 7



FISH of **patient 4** showing 2 hybridization signals for X centromeres **(DXZ1).**



FISH of **patient 7** showing chimeric chromosomal complement with both **46,XY and 46,XX cell lines**

Conclusions

- OT DSD should be considered as one of the **differential diagnoses in cases of ambiguous genitalia** with non palpable or asymmetrical gonads, pubertal gynecomastia, and cyclical hematuria, irrespective of the karyotype or internal genitalia.
- OT DSD can be presented with **different cytogenetic abnormalities**
- **Gonadal biopsy** is necessary to establish diagnosis in cases of sex chromosome mosaicism
- Chromosome studies carried out on **peripheral lymphocytes** do not always reflect the proportion of cell lines in the **gonads.**

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