King Saud University Medical City
Department of Obstetrics & Gynecology
Course 482

INTERSEXUALITY

ABNORMAL SEXUAL DEVELOPMENT

1-Sex chromosome abnormality

Mosaicism associated with gonadal dysgenisis ⇨ 45X/46XY

2-Testis incapable of producing testosterone

3-End organs incapable of utilizing testosterone eg. 5α reductase deficiency, failure of testosterone binding to receptors (androgen insensitivity)

ABNORMAL SEXUAL DEVELOPMENT

4-Defficient production of MIF ⇨ ♀ internal genital organs in other wise normal ♂

5-Musculanization of the ♀ external genitalia due to ↑ androgen eg. Congenital adrenal hyperplasia

6-Rarely 46XX male due to the presence of a gene the SRY gene (Sex determining Region Y)

7-True hermaphroditism ⇨ the presence of testicular & gonadal tissue in the same individual

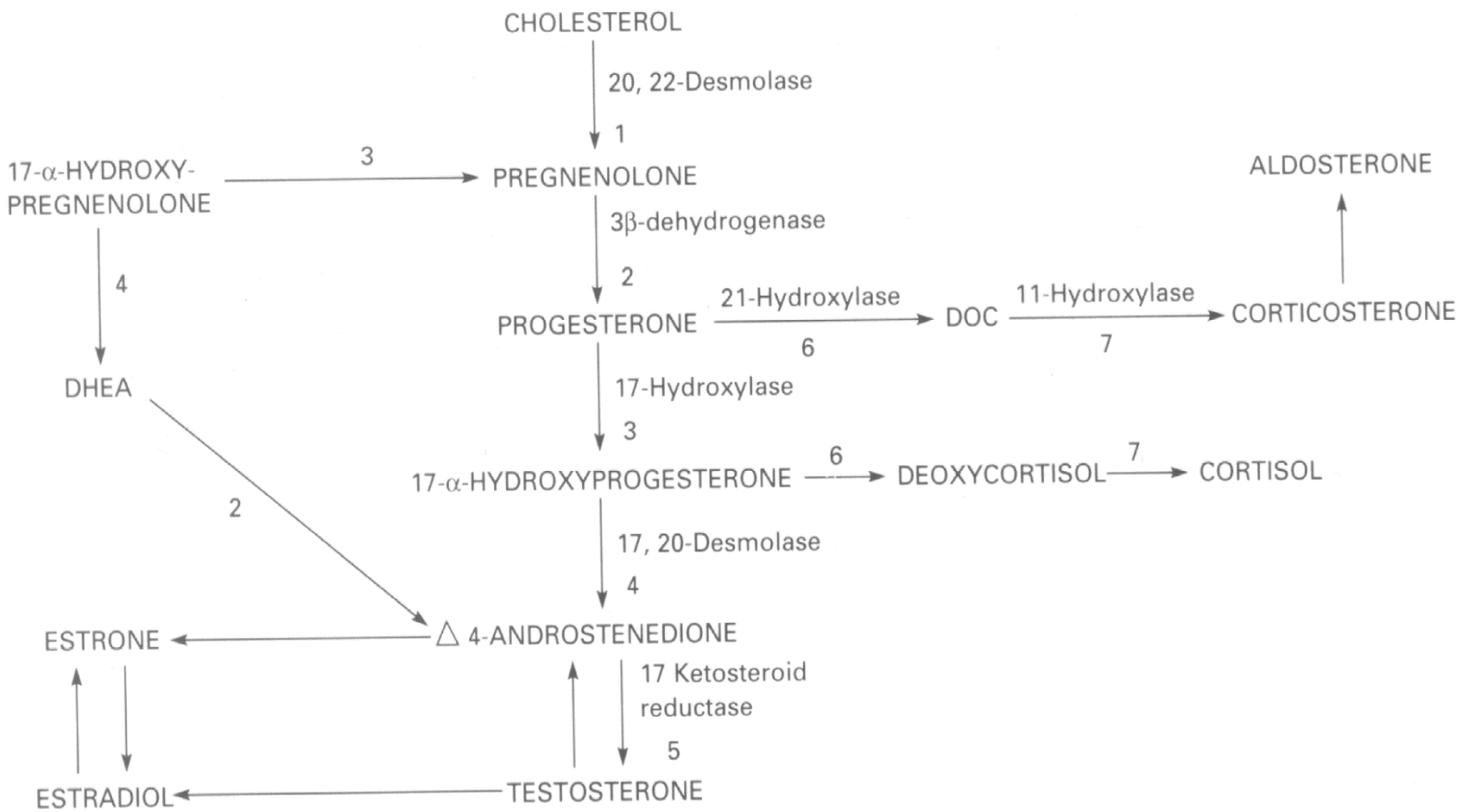
1-MUSCULINIZED ♀
♀ PSEUDOHERMAPHRODITES

-46XX

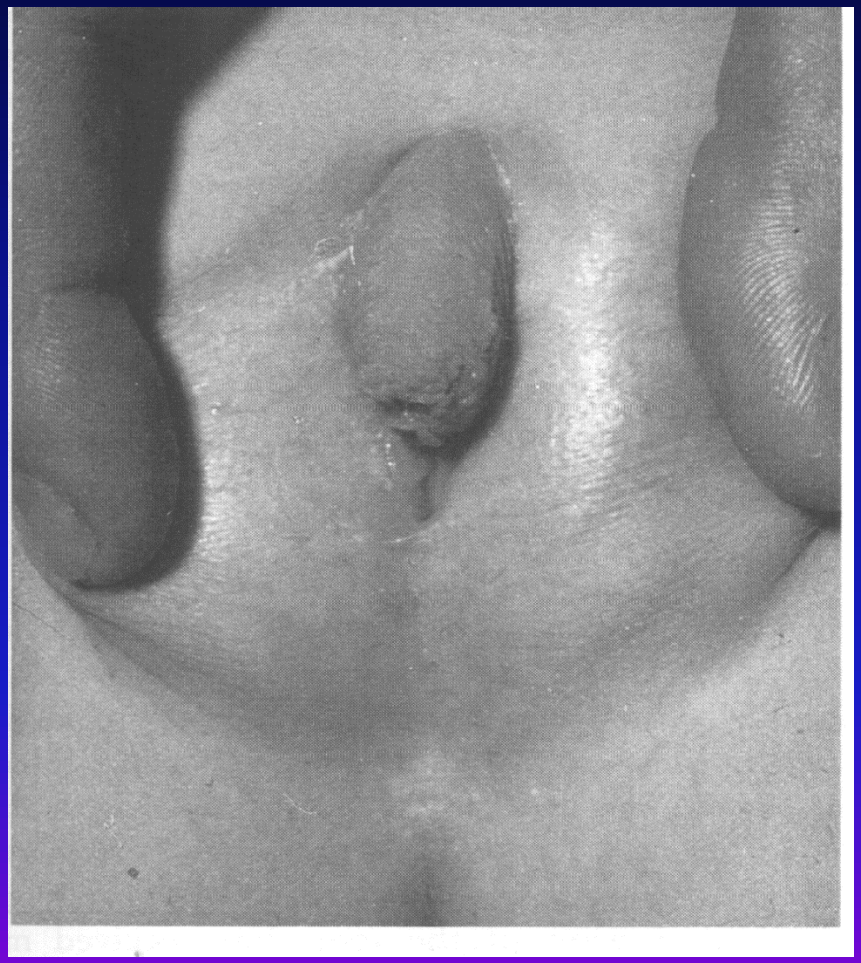
-Exposed to androgens in utero ⇨ varying degrees of musculinization of the external genitalia

A-CONGENITAL ADRENAL HYPER PLASIA (CAH)

- The most common cause of ♀ intersex
- Deficiencies of the various enzymes required for cortisol & aldosterone biosynthesis (21-hydroxylase, 11β-hyroxilase , 3βhydroxisteroid dehydrogenase)
- 21-hydroxylase deficiency is the commonest defect 90%
- Affected ♀ may present at birth with ambiguous genitalia
  -enlargement of the clitoris
  -excessive fusion of the genital folds obscuring the vagina & urethra


CHOLESTEROL
20, 22-Desmolase
1
17-α-HYDROXY-
PREGNENOLONE
3
PREGNENOLONE
ALDOSTERONE
3β-dehydrogenase
4
2
PROGESTERONE
21-Hydroxylase
6
DOC
11-Hydroxylase
7
CORTICOSTERONE
DHEA
17-Hydroxylase
3
17-α-HYDROXYPROGESTERONE
6
DEOXYCORTISOL
7
CORTISOL
2
17, 20-Desmolase
4
ESTRONE
△ 4-ANDROSTENEDIONE
17 Ketosteroid
reductase
5
ESTRADIOL
TESTOSTERONE

Congenital Adrenal Hyperplasia



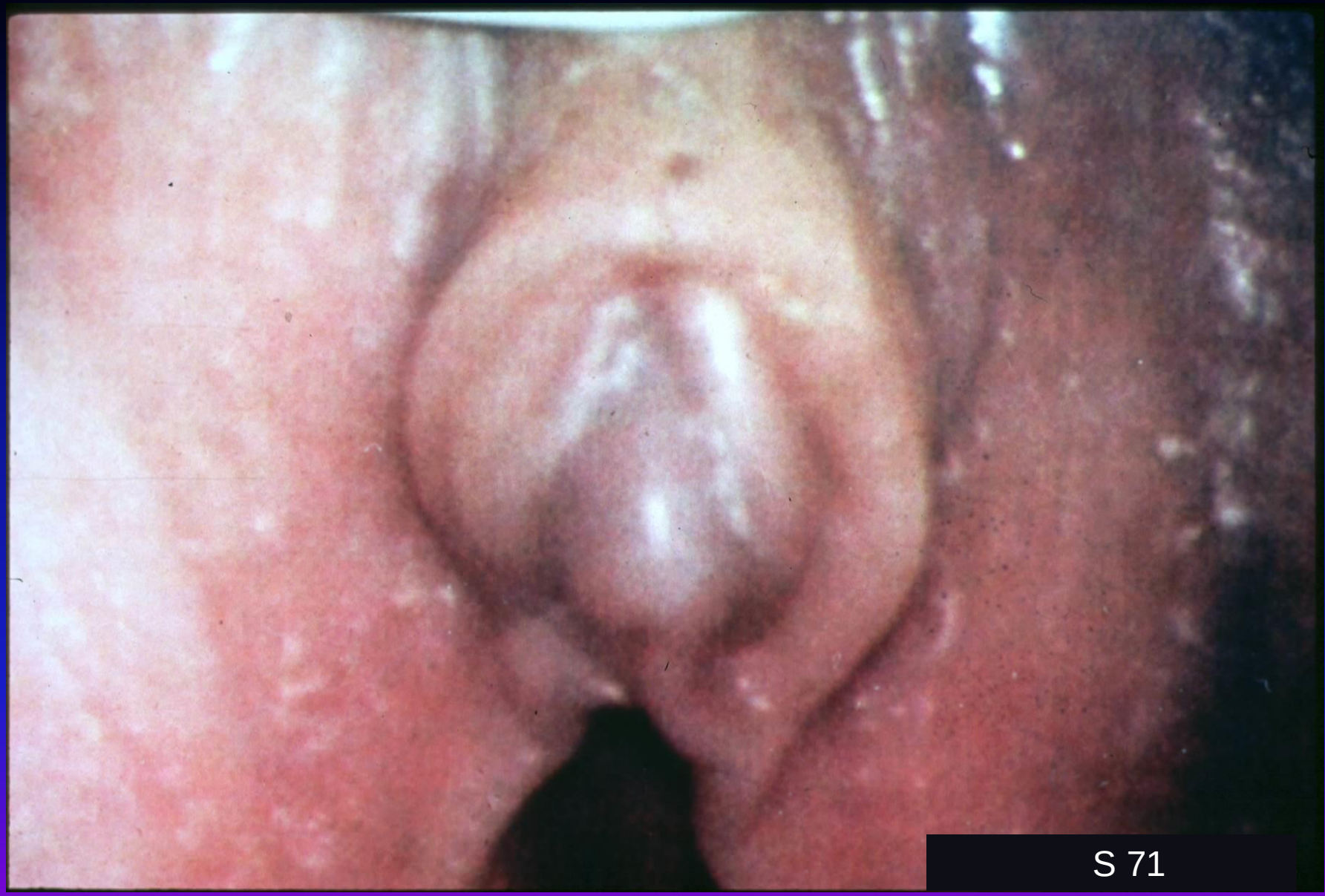
A-CONGENITAL ADRENAL HYPER PLASIA (CAH)

-thickening & rugosity of the labia majora resembling the scrotum

- A dangerous salt losing syndrome due to deficiency of aldosterone may occure in some pt

- Delayed menarche & menstrual irregularities

- INVESTIGATIONS
  - Karyotyping
  - 17-α-hydroxiprogestrone ↑
  - 17-ketosteroids (androgens) in urine
  - Electrolytes
  - U/S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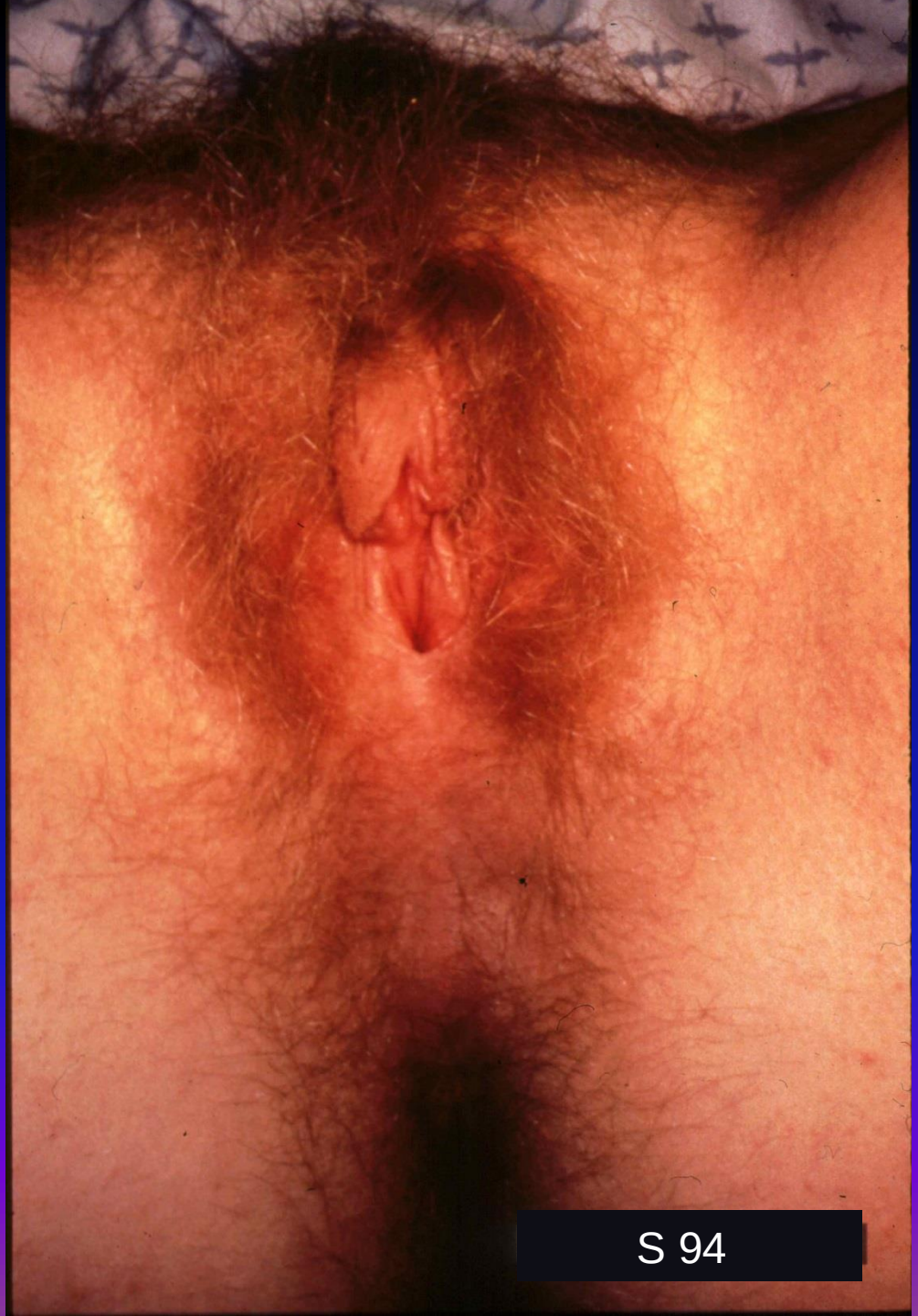
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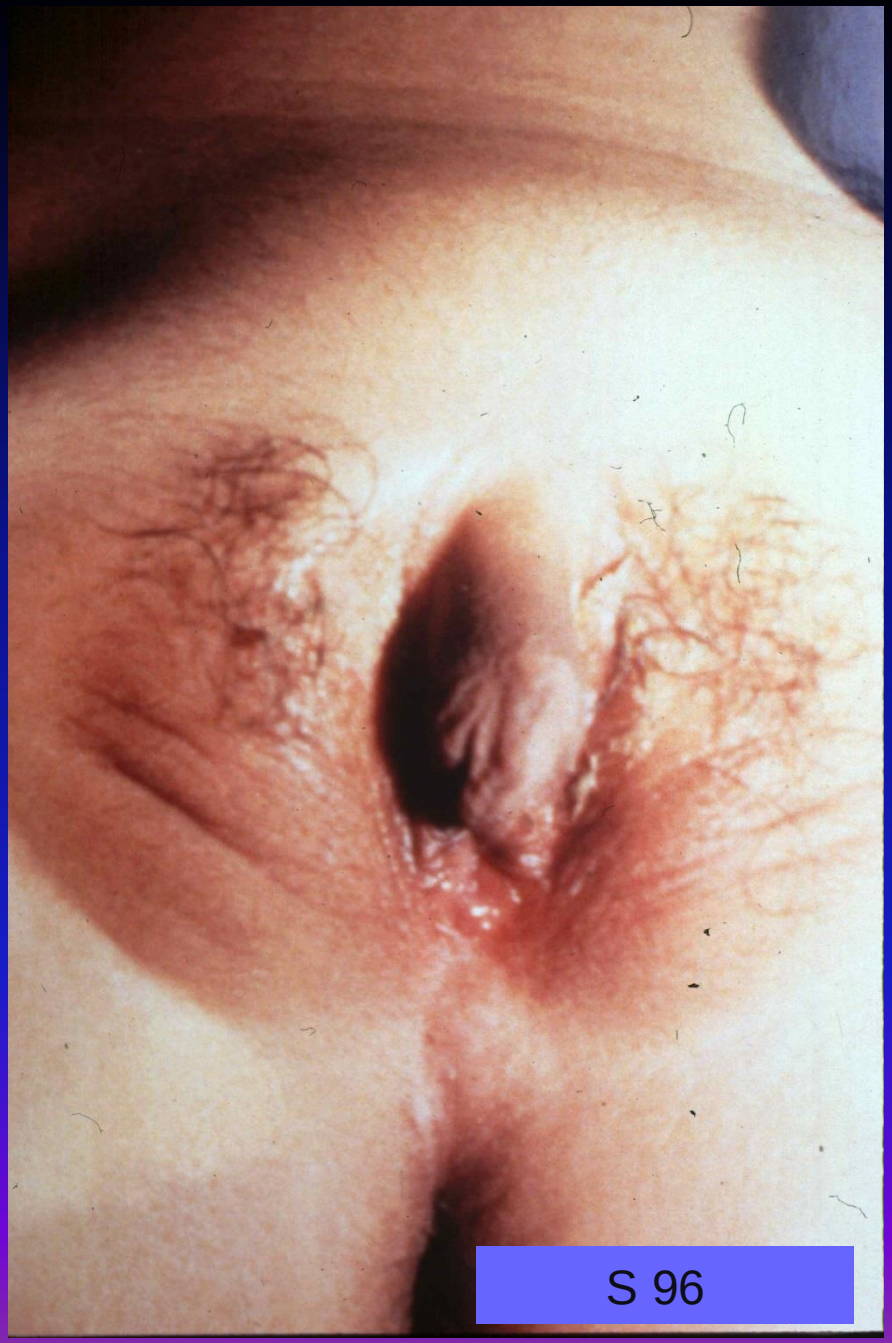
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A-CONGENITAL ADRENAL HYPER PLASIA (CAH)

- Rx

  1- Cortisol or its synthetic drevatives ⇨ suppress the adrenals ⇨ ↓ androgen production

  2-Corrective surgery

  clitroplasty (neonatal period)

  division of the fused labial folds

  (delayed till puberty)

MUSCULINIZED ♀

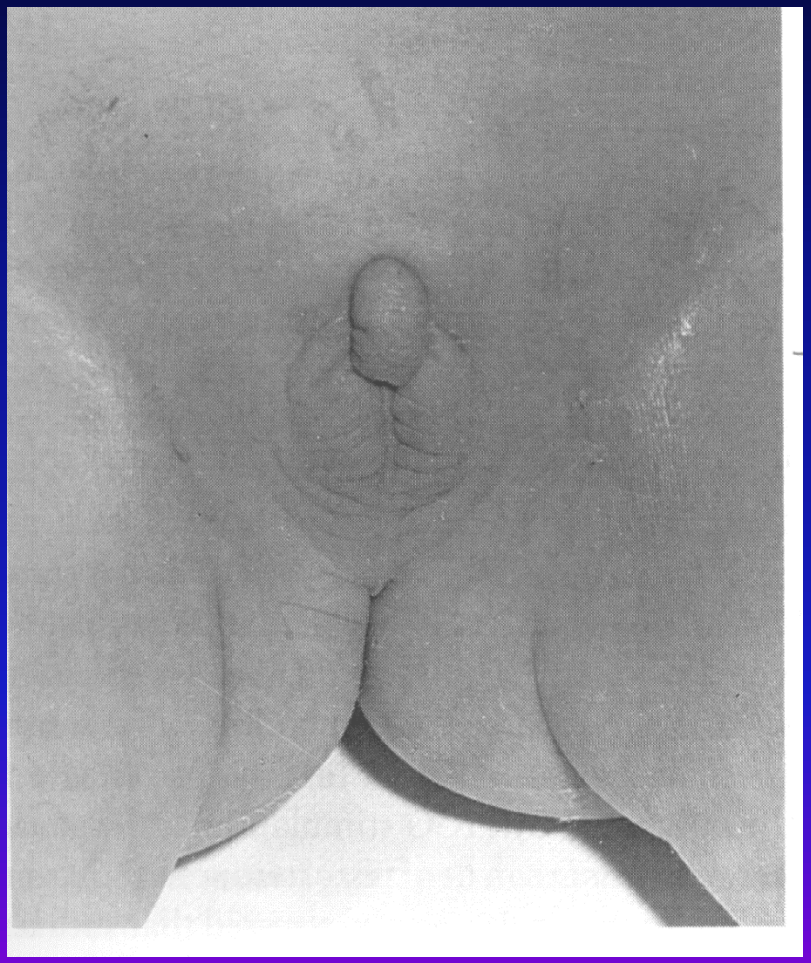
B- EXPOSURE OF THE MOTHER TO ANDROGENS

-Rare

-Androgen secreting tumours , eg. luteoma, arrhenoblastoma

-Drugs

Musculanization of female child
Mother exposed to methyle testosterone



2-UNDERMUSCULINIZED ♂
♂ PSEUDOHERMAPHRODITES

A-ANATOMICAL TESTICULAR FAILURE

-Pure gonadal dysgenisis

*normal chromosomes 46XY

*variable features – mild-severe

(normal ♀ , ♀ with mild musculinization)

*uterus present

-Mosaicism 45X/46XY

*Variable features

(normal ♀, ambiguous genitalia, nearly normal ♂)

♂ PSEUDOHERMAPHRODITES

B-ENZYMETIC TESTICULAR FAILURE

Enzymetic defects in the biosynthesis of testosterone

These defects are usually incomplete ⇨

Varying degrees of musculinization of the external genetalia

Uterus & tubes ⇨ absent (MIF produced by the testes)

♂ PSEUDOHERMAPHRODITES

C-ENDORGAN INSINSITIVITY

1-5α REDUCTASE DEFICIENCY

Autosomal recessive

Formation of the ♂ external genitalia requiers

5α REDUCTASE

testosterone ⇨ ⇨ ⇨ ⇨ dihydrotestosterone

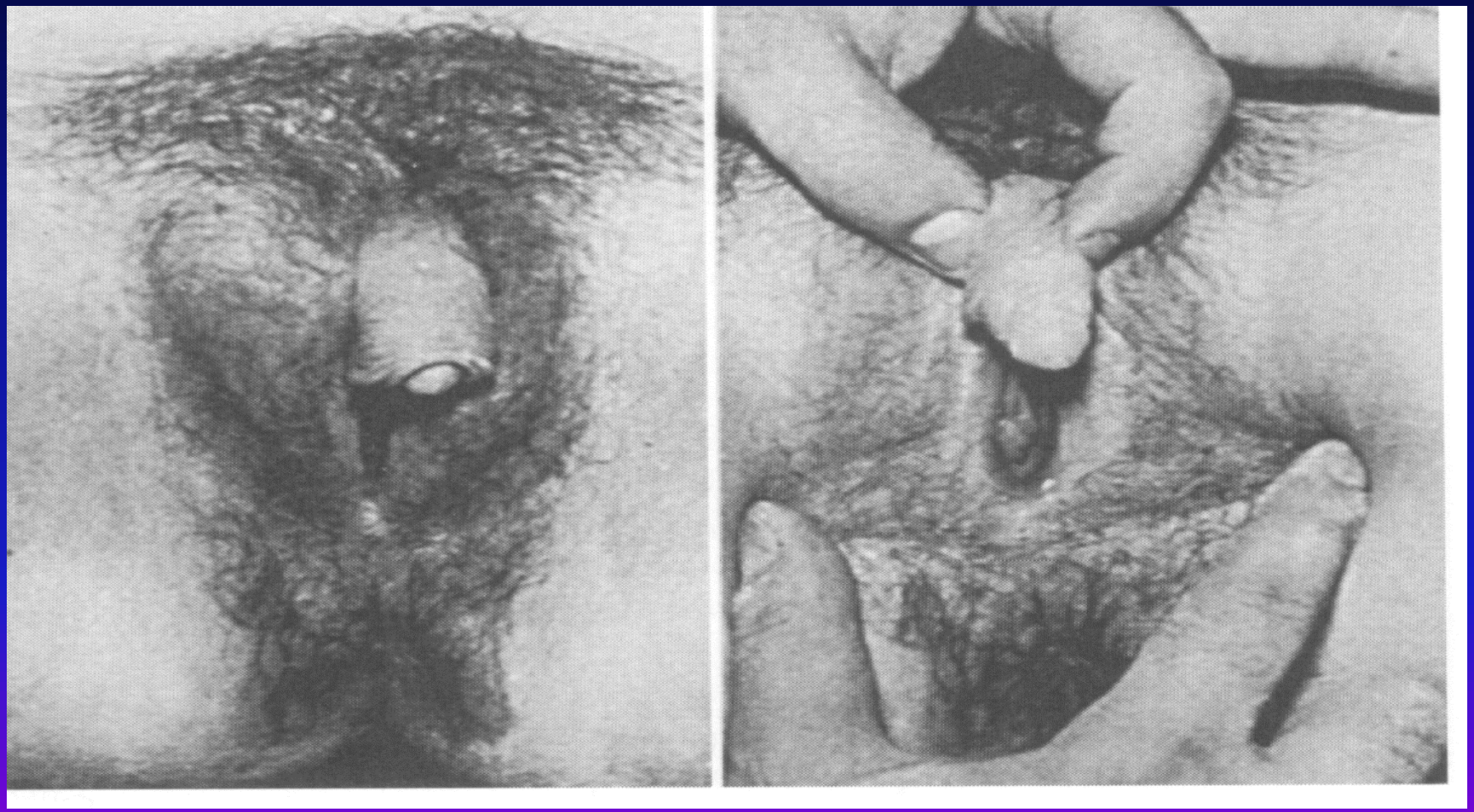
Formation of the internal wollfiane structures respond directly to testosterone

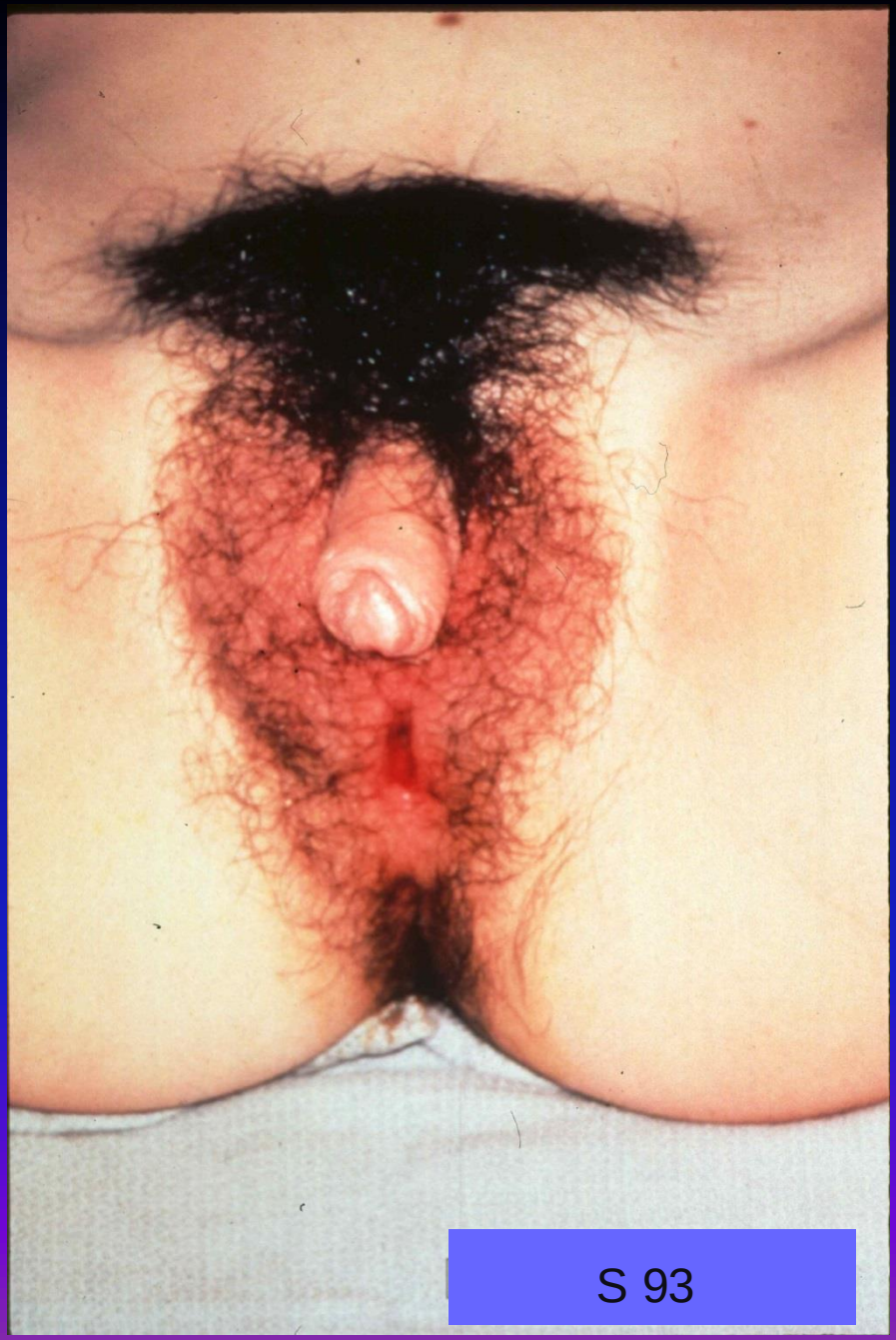
-External genitalia ♀ with mild musculinization

-Absent uterus

-At puberty ⇨ ↑ testosterone secretion ⇨ virilization

5-alpha reductase deficiency

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C-ENDORGAN INSINSITIVITY

2-ANDROGEN INSINSITIVITY (TESTICULAR FEMINIZATION)

Etiology

- Lack of androgen receptors ⇨ complete (classical TF)
- Receptors are present but low in NO. or inactive
  ⇨ incomplete androgen insinsitivity

Clinical features of Complete Androgen Insinsitivity

Normal ♀ external genitalia with blind vagina
Absent uterus
Breast development
Present with 1ry amenorrhea
Testes found in abdomen or inguinal canal
Normal ♂ Testosterone level

2-ANDROGEN INSINSITIVITY

Rx

Gonadectomy after puberty due to ↑ incidence of malignant change (5%)

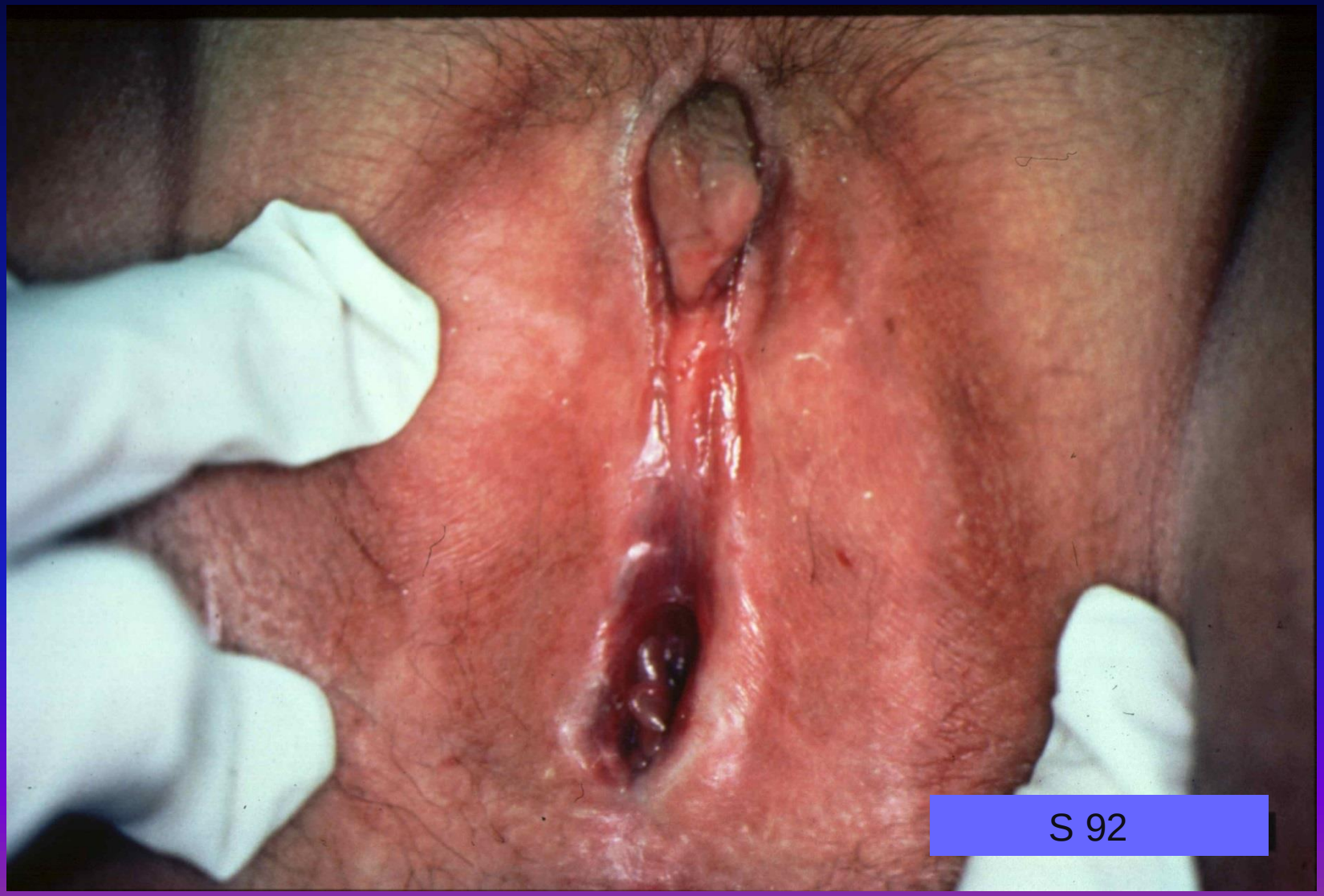
Oestrogen replacement

INCOMPLETE ANDROGEN INSINSITIVITY

Ambiguous genitalia with varying degrees

Breast development

Musculinization at puberty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3-TRUE HERMAPHRODITES

HAVE BOTH OVARIAN & TESTICULAR TISSUE

Ovotestes on one side & ovary or testes on the other

Ovary on one side & testes on the other

Bilateral ovotestes

Varying degrees of sexual ambiguity

KARYOTYPING

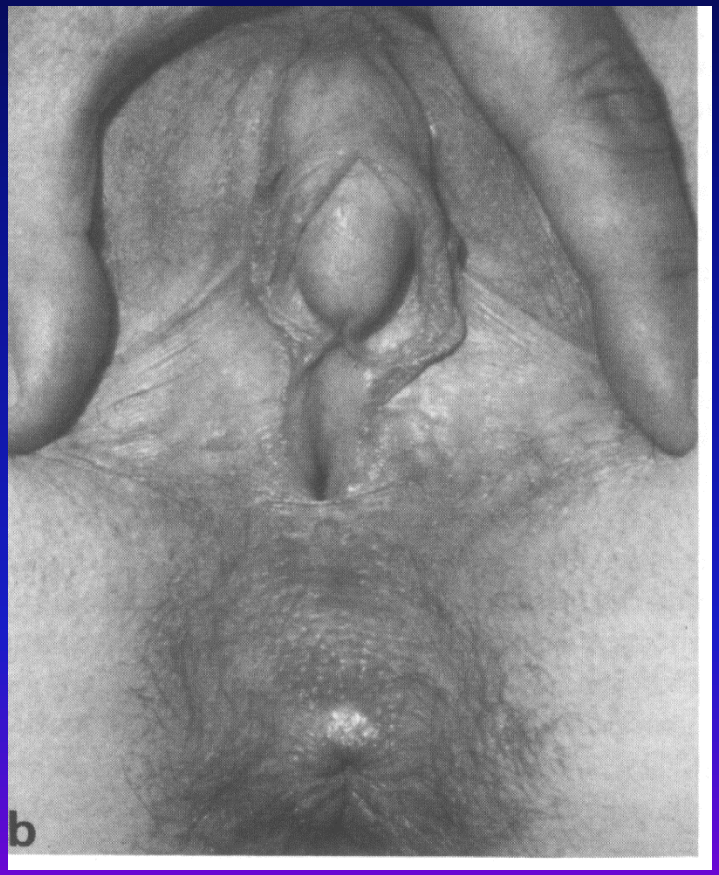
46XX ⇨ most common

46XX/XY

46XY

46XY/47XXY

TRUE HERMAPHRODITE



Klinefelter Syndrome

47XXY

Normal male external genitalia

Tall stature

Gynecomastia

Azospermia (infertility)