Patients with suspected XY PGD based on history and physical examination

Genetic testing
- Chromosomal analysis, including karyotype and array CGH
  - FISH for SRY
  - If SRY is present and chromosome analysis and array CGH are normal, consider sequence analysis for SRY, NR5A1, and DHH.
  - If these sequences are normal, verify coverage of NROB1 and WNT4 on array CGH testing and if not well covered, targeted duplication analysis may be considered
  - If other syndromic features are noted on physical exam, specific genetic testing should be sent:
    1. SOX9 sequencing if patient has findings consistent with campomelic dysplasia
    2. ATRX sequencing if patient has evidence of alpha-thalassemia X-linked mental retardation
    3. WT1 sequencing if patient has findings consistent with Denys-Drash

Hormonal Evaluation
- Basal LH and FSH may be elevated depending on age
- Exclude adrenal steroid biosynthesis defects, ruling out CAH
- Serum testosterone and AMH will be low
- hCG Stimulation test will show inadequate rise of testosterone in response to hCG

Surgical Management
- Can be combined with other genital reconstructive procedures
- Consider sending tumor markers including AFP, LDH, and β-hCG if patient has evidence of gonadal mass on pre-operative imaging and/or discordant pubertal characteristics
- Laparoscopy and Gonadal biopsy may be indicated.
- Histology will reveal a spectrum of under-developed gonads.
- See Figure 3 “Diagnostic and Management Algorithm for patients with Confirmed XY Gonadal Dysgenesis” for further guidance.

Imaging
- Pelvic Ultrasound or MRI to evaluate internal genital anatomy and position of gonads.
- May see absent to fully developed Müllerian structures.
- Gonads may be located in the abdomen, inguinal region, or in the scrotum

1 pre-pubertal aged children will likely have LH and FSH that are low (or in the normal range for a pre-pubertal child), whereas post-pubertal aged children will have elevated LH and FSH.

2 The presence of postive tumor markers indicates the necessity for a staged surgical procedure (laparotomy instead of laparoscopy)