Published in final edited form as:

Obstet Gynecol. 2015 October ; 126(4): 845–849. doi:10.1097/AOG.0000000000001034.

Transition to Adult Care in Persons With Disorders of Sexual Development: The Role of the Gynecologist

Anne-Marie Amies Oelschlager, M.D.¹, Miriam Muscarella², and Veronica Gomez-Lobo, M.D.³

¹University of Washington School of Medicine, Seattle WA

² Accord Alliance Advocacy Advisory Network/Disorders of Sex Development Translational Research Network

³ MedStar Washington Hospital Center/Children's National Medical Center, Washington, DC

Abstract

Disorders of sexual development (DSD) are a spectrum of conditions diagnosed in infancy due to atypical development of the external genitalia, in adolescence due to atypical pubertal development, or in adulthood due to infertility. Obstetricians may be the first providers to identify a DSD in the fetus or newborn, and should be part of the interdisciplinary team assembled to best care for these patients. Gynecologists must be familiar with the diagnosis and management of these conditions in late adolescence and adulthood. The creation of DSD “centers of excellence” may provide optimal care for individuals with these conditions but many will live too far from such centers and need to be followed by local gynecologists. The purpose of this commentary is to emphasize important medical and psychological issues so gynecologists can provide optimal care for their patients with DSD conditions.

Background

Disorders of sexual development (DSD), also known as differences of sex development, are defined as congenital conditions with atypical development of chromosomal, gonadal, or anatomic sex.¹ A 2005 consensus meeting suggested a classification of these conditions based on underlying karyotype and gonad type. Sex chromosome disorders include Turner syndrome (45X), Klinefelter syndrome (45XXY), mixed gonadal dysgenesis (45X/46XY), and ovotesticular disorders (46XX/46XY or 45X/46XY). 46XY disorders include disorders of testicular development (Swyer syndrome or complete gonadal dysgenesis), disorders of androgen synthesis (5 α reductase deficiency and 17 β hydroxysteroid dehydrogenase deficiency) and disorders of androgen action (androgen insensitivity syndrome). 46XX

Corresponding author: Veronica Gomez-Lobo, M.D., MedStar Washington Hospital Center/Children's National Medical Center, Professor of Clinical Ob/Gyn, Georgetown University, 110 Irving Street Rm 5B41, Washington, DC 20010, Phone 202-877-4099, Fax 202-877-6975, veronica.gomez-lobo@medstar.net.

This document was developed with participation of the Transition Group of the Disorders of Sex Development Translational Research Network (DSD-TRN) and the North American Society for Pediatric and Adolescent Gynecology Disorders of Sex Development Interest Group.

Financial Disclosure: The authors do not report any potential conflicts of interest.

disorders include disorders of ovarian development (ovotesticular DSD and gonadal dysgenesis), androgen excess conditions (congenital adrenal hyperplasia, fetoplacental aromatase deficiency, maternal luteoma, exogenous), and other conditions (vaginal and mullerian agenesis, cloacal exstrophy).¹ When these conditions are identified in infancy or in adolescence, patients are usually cared for by pediatric providers and decisions around genital alterations, management of gonadal tissue, and hormone therapy may have occurred before adolescence. Obstetricians and gynecologists often become involved in the care of these patients when delivering newborns or evaluating young women with atypical puberty or infertility. DSD “centers of excellence” are usually located in tertiary care settings catering to pediatric populations; however, many women will see their local gynecologist for routine health care. The purpose of this commentary is to highlight important medical and psychological issues encountered in patients with DSD so gynecologists can provide optimal care.

Transition to adult care from pediatric care

Obtaining and Sharing Medical Records

Ideally, the pediatric and adult providers will communicate about the patient, and the gynecologist will obtain detailed medical records to review. Medical records should include operative reports, genetic testing, laboratory testing, pathology reports, radiology imaging of sex organs and bone density, clinic notes on hormone treatments, and psychological evaluations. Time should be set aside to share and explain these records with the patient so she can better understand her condition and her previous care.

Assessing Knowledge and Disclosure

Gynecologists should not assume that there has been adequate preparation to help the adolescent transition to independent adult care.² Due to the complex nature of DSD as well as the possibility of incomplete explanation from both parents and clinicians, a patient may have limited knowledge of her condition.³ Thus, during the initial visit, the patient should be asked to explain her understanding of her diagnosis, what treatments she has received, and her understanding of her adult care needs.

The American Medical Association has rejected the premise that physicians do not need to disclose conditions that they judge may cause psychological distress and states that it is unethical for physicians to withhold information from their patients.⁴ As soon as the physician identifies that a patient does not have full information or understanding about her condition, a plan for disclosure should be put in place. Gradual and sensitive education of the patient is likely to be more beneficial than abrupt discovery at an advanced age.⁵ Physicians can best explain the underlying conditions by avoiding medical jargon, and explaining the action of chromosomes, hormones and structures. Furthermore, it is important to note that terminology such as “blind” vagina, “pseudohermaphrodisism” and “phallic structure” can be confusing and hurtful to patients.

Respect for autonomy

Patients with complex DSD conditions may have relied on their parents for decision-making and assistance with medication compliance prior to transition to adult care.³ Furthermore, patients may have had negative experiences (potentially due to multiple genital exams, lack of disclosure, or conflicts regarding compliance) and consequently may find it difficult to trust care providers. The gynecologist needs to be patient and take into consideration the patient's motivations for clinic visits. She should be reassured that pelvic examination will only be performed if there is medical benefit to her care and with her consent, particularly if other physicians are to be present.

Developing a care team network

A DSD multidisciplinary team may be available in pediatric settings, but there are few adult centers; and patients often choose to seek care closer to home.⁶ Women often visit their gynecologists for primary care, reproductive health issues, and for assistance coordinating care with other specialists. Centers which offer multidisciplinary DSD care such as those participating in the NIH funded DSD-Translational Research Network (DSD-TRN) can serve as resources for local physicians. (<https://dsdtrn.genetics.ucla.edu/aboutdsdtrn>).

Assessing psychosocial support and health, gender identity, and sexual attraction

Gynecologists need to consider the psychological health and well-being for their patients with DSD. Starting in childhood, parents report stress, anxiety, and depression related to their child's condition and may develop maladaptive parenting strategies.⁷ Additionally, it is not clear how the medical condition itself (e.g., prenatal hormone exposure, hypogonadism, or hormone replacement) may affect psychological health. Many women with DSD conditions express anxiety and distress related to shame, stigma, infertility, and identity concerns. They experience higher rates of suicide attempt than adults with other medical conditions and should be screened for depression.^{8,9} In addition to psychosocial specialists, peer support and advocacy groups can be invaluable for the patient to understand that she is not alone and gain tools to navigate her day-to-day life, relationships, and health care. (Box 1)

Gender expression and identity

For patients with atypical genitalia identified at birth, gender assignment is currently based on the underlying diagnosis, genital appearance, potential for fertility, potential for gonadal hormone production, possible reconstructive procedures, and family beliefs and culture.¹ Female individuals with higher levels of presumed prenatal androgen exposure may demonstrate gender nonconforming behavior, but most individuals with DSD conditions identify with their assigned gender of rearing. They may, however, have higher rates of gender dysphoria compared to the general population.¹⁰ It is important to allow the patient to consider gender in her own terms and decide for herself what the DSD means to her: whether she wants to identify herself as an intersex person, a woman through an alternate pathway, or a person with a specific DSD condition. For the purpose of this review, we refer

to the patient seeking care from the gynecologist as “she,” however this does not imply that your patient will identify strictly as such.

Sexual attraction and orientation

Gender identity (the gender the patient feels herself to be) is distinct and independent from sexual orientation (the sex to whom one is sexually and romantically attracted). Some DSD conditions are associated with increased bisexual and homosexual attraction.¹¹

MEDICAL AND SURGICAL CONSIDERATIONS

Malignancy

In women with 46,XY DSD, there is a condition-specific risk of developing gonadal tumors which include seminoma, dysgerminoma and gonadoblastoma.¹² Absolute risks of malignancy are unknown due to the nature of small retrospective studies and high rates of prophylactic gonadectomy.¹³ Ultrasound, MRI, gonadal biopsy and tumor markers have been employed to monitor in-situ gonads but there is currently no evidence-based protocol. Pap screening is not recommended for patients born without a cervix, but monitoring the vagina with visual inspection and biopsy of suspicious lesions is appropriate, particularly in patients experiencing bleeding, pain or unusual discharge.^{14,15} All patients, with or without a cervix, should be offered the HPV vaccination due to risk of dysplasia and sexually transmitted infections.¹⁶

Hypogonadism and Hormone Replacement

In the patient with gonadal insufficiency or post gonadectomy, long term sex steroid replacement is essential to avoid known risks of hypogonadism. Young individuals with DSD are at very high risk of osteoporosis, and those with complete androgen insensitivity, congenital adrenal hyperplasia or hypogonadism may begin monitoring bone density in late adolescence.¹⁷ It is important to note that sex hormone replacement in these patients is different than in post-menopausal women and higher doses may be required.

Genital Function and sexual experience

Currently, there is controversy over the timing for surgical interventions and some families opt to delay surgery until their child can mature, express gender identity, understand the nature of the operation, and give informed assent or consent for the procedure.¹⁸ The gynecologist must be prepared to manage prior operative interventions and assist with decisions moving forward. Women with these conditions may have atypical appearing external genitalia even after repair, and it is important that the gynecologist avoid statements that may lead to additional anxiety and body dysmorphia. Furthermore, although they directly affect intimacy and sexual experience, there is a paucity of data addressing long-term outcomes of vaginal elongation or reconstructive procedures, and routine care needs to address sexual fear, dyspareunia, arousal, lubrication, and orgasm.^{19,20} Individuals with DSD may experience anxiety about sexual function and fear of intimacy and many may delay sexual experiences into adulthood.^{21,22} The gynecologist is in a unique position to address these issues and should offer psychological support and sex therapy where available.

Primary perineal dilation is considered the least invasive and safest method for vaginal elongation in patients with a shortened vagina due to their underlying condition and the gynecologist may need to assist with the dilation process.¹⁴ Women do not necessarily require vaginal elongation for their well-being, thus a patient should guide the decision of whether or not she desires to have penetrative intercourse as well as when she is ready to proceed. Working with a local physical therapist who provides care for women with pelvic floor dysfunction or pain may be helpful; direct communication may improve the therapists' understanding of the condition and goals of treatment. Providers should understand that the vagina created through perineal dilation may function well during intercourse but may not be as deep as expected.

Surgery

Given the high risk of complications, referral to a center with expertise is recommended for surgical management of these conditions.

Complications of vaginoplasty—Vaginal dilation is often required after vaginoplasty procedures, thus surgery is not a way to avoid dilation. Complications other than stenosis include: skin grafts with hair-bearing skin in the vagina, colitis, inflammatory bowel disease, adenocarcinoma in intestinal neovaginas and vaginal prolapse.²³⁻²⁶

Complications of clitoral surgery—Clitoral reduction procedures performed in childhood may cause decreased or absent clitoral sensation, pain, scars and inclusion cysts. Dissatisfaction with surgical outcomes is often reported among affected individuals; however it is difficult to separate the effects of body dysmorphia versus sexual function.²²

Fertility

Although many DSD conditions are associated with infertility, pregnancy may occur with some conditions. Gynecologists must know gonadal type, function and internal anatomy to assess the need for contraception and discuss fertility options. Finally, the underlying genetic diagnosis needs to be discussed as it may affect offspring.

Genetics

With advances in genetic and hormonal testing, individuals without a clear etiology for their condition may be interested in further evaluation.²⁷ Referral to a geneticist with experience with DSD conditions should be encouraged.

Discussion

Disorders and differences of sex development encompass a variety of conditions, and obstetricians and gynecologists will likely encounter affected individuals in their practices. It is important that they provide patient-centered care with the help of community resources, therapists, and other medical specialists.

Box 1**Resources for Providers and Families**

DSD-Translational Research Network: dsdtrn.genetics.ucla.edu
Accord Alliance: accordalliance.org
DSD: dsdfamilies.org
Müllerian Agenesis: beautifulyoumrkh.org ; mrkh.org
Turner Syndrome: turnersyndrome.org
Congenital Adrenal Hyperplasia: caresfoundation.org
Androgen Insensitivity- aisdsd.org
Advocates for Informed Choice - aiclegal.org

DSD, disorders of sexual development.

Acknowledgments

Supported in part by Award Number R01 HD068138 from the *Eunice Kennedy Shriver* National Institute for Child Health and Human Development.

References

1. Lee PA, Houk CP, Ahmed SF, Hughes IA, collaboration with the participants in the International Consensus Conference on Intersex. Consensus statement on management of intersex disorders. *Pediatrics*. 2006; 118:e488–500. [PubMed: 16882788]
2. Liao L, Tacconelli E, Wood D, Conway G, Creighton S. Adolescent girls with disorders of sex development: A needs analysis of transitional care. *J Ped Urol*. 2010; 6:609–13.
3. Liao L, Green H, Creighton S, Crouch N, Conway G. Service users' experiences of obtaining and giving information about disorders of sex development. *BJOG*. 2010; 117:193–9. [PubMed: 19843046]
4. American Medical Association. Withholding Information from Patients. Health and Ethics Policies of the AMA House of Delegates. Opinion. 2007 E-8.082.
5. Austin JL, Tamar-Mattis A, Mazur T, Henwood MJ, Rossi WC. Disorders of sex development: When and how to tell the patient. *Pediatr Endocrinol Rev*. 2011; 8:213–7. [PubMed: 21525798]
6. Consortium on the Management of Disorders of Sex Development. Clinical guidelines for the management of disorders of sex development in childhood. Accord Alliance; Whitehouse Station, NJ: 2006.
7. Wisniewski AB, Sandberg DE. Parenting children with disorders of sex development (DSD): A developmental perspective beyond gender. *Hormone and metabolic research*. 2015; 47:375–379. [PubMed: 25654767]
8. Johannsen T, Ripa C, Mortensen E, Main K. Quality of life in 70 women with disorders of sex development. *Eur J Endocrinol*. 2006; 155:877–85. [PubMed: 17132758]
9. Warne G, Grover S, Hutson J, Sinclair A, Metcalfe S, Northam E, Freeman J. A long-term outcome study of intersex conditions. *J Pediatr Endocrinol Metab*. 2005; 18:555–67. [PubMed: 16042323]
10. Yang J, Baskin L, DiSandro M. Gender Identity in Disorders of Sex Development: Review Article. *Urology*. 2010; 75:153–9. [PubMed: 19914694]
11. Frisen L, Nordenstrom A, Falhammar H, Filipsson H, Homdahl G, Janson P, et al. Gender role behavior, sexuality, and psychosocial adaptation in women with congenital adrenal hyperplasia due to CYP21A2 deficiency. *J Clin Endo Metab*. 2009; 94(9):3432–9.

12. Cools M, Drop S, Wolffenbuttel K, Oosterhuis J, Looijenga L. Germ cell tumors in the intersex gonad: old paths, new directions, moving frontiers. *Endocr Rev.* 2006; 27:468–84. [PubMed: 16735607]
13. Deans R, Creighton S, Liao L, Conway G. Timing of gonadectomy in adult women with complete androgen insensitivity syndrome (CAIS): patient preferences and clinical evidence. *Clinic Endocrinol.* 2012; 76:894–8.
14. American College of Obstetricians and Gynecologists Committee on Adolescent Health. Mullerian agenesis: diagnosis, management and treatment. Committee Opinion 562. *Obstet Gynecol.* May; 2013 121(5):1134–7. [PubMed: 23635766]
15. Steiner E, Woernle F, Kuhn W, Beckmann K, Schmidt M, Pilch H, et al. Carcinoma of the neovagina: case report and review of the literature. *Gynecol Oncol.* 2002; 84:171–5. [PubMed: 11748997]
16. Lowe M, Ault K, Sood A. Recurrent carcinoma in situ of a neovagina. *Gynecol Oncol.* 2001; 80:403–4. [PubMed: 11263940]
17. Bertonelli S, Baroncelli G, Mora S. Bone health in disorders of sex development. *Sex Dev.* 2010; 4:270–84. [PubMed: 20820111]
18. Michala L, Liao L, Wood D, Conway G, Creighton S. Practice changes in childhood surgery for ambiguous genitalia. *J Pediatr Urol.* 2014; 10:934–9. [PubMed: 24656627]
19. Lee P, Schober J, Nordenstro A, Hoebeke P, Houk C, Looijenga L, et al. Review of recent outcome data of disorders of sex development (DSD): Emphasis on surgical and sexual outcomes. *J Pediatr Urol.* 2012; 8:611–5. [PubMed: 23158651]
20. Nadarajah S, Quek J, Rose G, Edmonds D. Sexual Function in Women Treated with Dilators for Vaginal Agenesis. *J Pediatr Adolesc Gynecol.* 2005; 18:39–42. [PubMed: 15749583]
21. Kleinemeier E, Jürgensen M, Lux A, Widenka PM, Thyen U. Disorders of Sex Development Network Working Group. Psychological adjustment and sexual development of adolescents with disorders of sex development. *J Adolesc Health.* 2010; 47:463–71. [PubMed: 20970081]
22. Köhler B, Kleinemeier E, Lux A, Hiort O, Grüters A, Thyen U. DSD Network Working Group. Satisfaction with Genital Surgery and Sexual Life of Adults with XY Disorders of Sex Development: Results from the German Clinical Evaluation Study. *J Clin Endocrinol Metab.* 2012; 97:577–88. [PubMed: 22090272]
23. Toolenaar T, Freundt I, Huikeshoven F, Drogendijk A, Jeekel H, Chadha-Ajwani S. The occurrence of diversion colitis in patients with a sigmoid neovagina. *Hum Pathol.* 1993; 24:846–9. [PubMed: 8375855]
24. Schober J. Cancer of neovagina. *J Pediatr Urol.* 2007; 3:167–70. [PubMed: 18947728]
25. Webster T, Appelbaum H, Weinstein T, Rosen N, Mitchell I, Levine J. Simultaneous development of ulcerative colitis in the colon and sigmoid neovagina. *J Ped Surg.* 2013; 48:669–72.
26. Klingele C, Gebhart J, Croak D, DiMarco C, Lesnick T, Lee R. McIndoe procedure for vaginal agenesis: Long-term outcome and effect on quality of life. *Am J Obstet Gynecol.* 2003; 189:1569–72. [PubMed: 14710067]
27. Baxter R, Arboleda V, Lee H, Barseghyan H, Adam M, Fechner P, et al. Exome sequencing for the diagnosis of 46,XY disorders of sex development. *J Clin Endocrinol Metab.* 2015; 100:e333–44. [PubMed: 25383892]