Publisher
MEDRESEARCH
www.medresearch.in

Obs Gyne Review - Journal of Obstetric and Gynecology
2025 Volume 11 Number 1 Jan-Dec

E-ISSN:2455-5444
P-ISSN:2581-4389
RNI:MPENG/2017/74037

Case Report
Swyer Syndrome

Unravelling the Mystery of Swyer Syndrome- When XY meets XX

Subbarayudu K[1*], Amu J[2]

DOI:https://doi.org/10.17511/joog.2025.i01.04

[1*] Kavya Subbarayudu, Registrar in Department of Obstetrics and Gynaecology, Blackpool Teaching Hospitals, Blackpool, UK.

[2] Johnson Amu, Consultant in Department of Obstetrics and Gynaecology, Blackpool Teaching Hospitals, Blackpool , UK.

Swyer syndrome, or 46 XY complete gonadal dysgenesis, is a rare disorder of sexual development where individuals with a male karyotype present with a female phenotype. This case report describes a 16-year-old female with primary amenorrhea and normal secondary sexual characteristics, later diagnosed with Swyer syndrome following hormonal, imaging, and genetic evaluation. She underwent prophylactic gonadectomy due to the risk of gonadoblastoma, which was confirmed histologically. Management included hormonal replacement therapy and multidisciplinary follow-up. This case highlights the importance of early diagnosis, surgical intervention, and long-term support to mitigate malignancy risk and promote optimal physical and psychosocial outcomes.

Keywords: Swyer syndrome, 46XY, Complete gonadal dysgenesis, disorders of sex development

Corresponding Author

Kavya Subbarayudu, , Registrar in Department of Obstetrics and Gynaecology, Blackpool Teaching Hospitals, Blackpool, , UK.
Email: kavyabs2693@gmail.com

How to Cite this Article

Subbarayudu K, Amu J, Unravelling the Mystery of Swyer Syndrome- When XY meets XX. Obs Gyne Review J Obstet Gynecol. 2025;11(1):21-24.
Available From
https://obstetrics.medresearch.in/index.php/joog/article/view/183

To Browse

Manuscript Received	Review Round 1	Review Round 2	Review Round 3	Accepted
2025-07-08	2025-07-16	2025-07-24	2025-08-01	2025-08-09

Conflict of Interest	Funding	Ethical Approval	Plagiarism X-checker	Note
The authors declare no conflicts of interest.	This research received no specific grant from any funding agency.	Yes	10.32	

Case report

A 16-year-old female who presented to adolescent gynaecology with primary amenorrhea. Her BMI was 23 with normal secondary sexual characteristics and no evidence of hematocolpos. Pelvic ultrasound revealed a peripubertal uterus with a thin endometrial lining; both ovaries were small and featureless, with no developing follicles. Further radiological imaging with MRI revealed a small anteverted uterus with follicular activity in the right ovary, but the left ovary was not clearly visualised.

Laboratory findings indicated elevated levels of Follicle-stimulating hormone (FSH), Luteinising hormone (LH) and female testosterone. The 17-beta oestradiol, Free androgen index (FAI), thyroid and prolactin levels were within normal range. Karyotype analysis identified a 46 XY genotype; therefore, she was referred to the regional genetics service, which confirmed a diagnosis of Swyer's Syndrome (Gonadal dysgenesis).

Due to the potential for malignant transformation of the underdeveloped gonads, she was counselled to undergo surgical removal of the ovaries. At an initial operation, the left ovary was not identified; therefore, a laparoscopic bilateral salpingectomy and only a right oophorectomy were performed. She underwent a further robotic minimal access surgical exploration of the left pelvic side wall and excision of residual streak gonadal tissue at the regional oncology centre. The regional gynaecology oncology and specialist (germ cell) multidisciplinary team (MDT) were involved in her management. The histopathology of the specimens removed at the two surgical procedures showed gonadoblastoma. She is currently on a combined oral contraceptive pill (COCP) akin to hormone replacement therapy (HRT) for cardiovascular disease and osteoporosis risk reduction. She remains under ongoing follow-up with the adolescent gynaecology clinic.

Discussion

Swyer syndrome (46XY complete gonadal dysgenesis) was first described by Swyer in 1955 as a condition where individuals with a 46XY karyotype develop female external genitalia but lack functional gonads [1]. The underlying genetic cause is usually a mutation or deletion in the SRY gene, which encodes the testis-determining factor(TDF) critical for testicular differentiation [2].

The absence of functional testes in individuals with a male genetic composition leads to a female phenotype with streak gonads, resulting in infertility, primary amenorrhea, and an increased risk of gonadal malignancies.

The incidence of Swyer syndrome is estimated to be 1 in 30,000 to 1 in 100,000 live births, often diagnosed during adolescence when individuals fail to menstruate [3].

These streak gonads, while capable of some limited cellular activity, are non-functional and pose a risk for the development of germ cell tumours, which can occur in up to 30% of individuals with this condition, including dysgerminomas and gonadoblastomas [4,5]. The risk of tumour formation increases with age, particularly post-puberty, underlining the importance of early gonadectomy [6].

The majority of individuals with Swyer syndrome present with primary amenorrhea, typically around the age of 15 to 16 years. There is a complete absence of menstruation and secondary sexual characteristics such as breast development and pubic hair. A pelvic ultrasound or MRI often reveals streak gonads and a small uterus [7]. Endocrine evaluation typically reveals hypergonadotrophic hypogonadism, with elevated gonadotropins like FSH, LH, and sex steroid levels(estradiol, testosterone) within the low-normal female reference range.[8].

Genetic testing is critical to confirm the diagnosis, revealing a 46XY karyotype despite the presence of a female phenotype [9]. This definitive diagnostic step is essential for distinguishing Swyer syndrome from other disorders of sexual development (DSDs).

Swyer syndrome is a rare but clinically significant condition that requires early diagnosis and multidisciplinary management. Gonadectomy, hormone replacement therapy, and psychosocial support are integral components of care. Advances in ART provide fertility options, and regular follow-up is necessary to monitor for malignancy and optimise long-term health outcomes.

Early intervention, including gonadectomy and hormone replacement therapy (HRT), is essential to mitigate the risk of malignancy and to support sexual and reproductive health. (HRT) is initiated to induce breast development, maintain bone health, and support cardiovascular function(10).

Hormone replacement therapy is initiated during adolescence, starting with estrogen to stimulate secondary sexual characteristics and optimise skeletal development. Progesterone is introduced subsequently to induce endometrial shedding and replicate cyclical hormonal patterns [10,11].

Although patients with Swyer syndrome lack functional gametes, reproductive potential can be realised through assisted reproductive techniques such as IVF with oocyte donation. [12]

Psychosocial support is essential for individuals with Swyer syndrome, as the diagnosis may impact body image, gender identity, and self-esteem. Moral support from family members and health-care professionals is crucial to avoid depression and suicidal thoughts and enhance satisfactory sexual functioning in adulthood. [13,14].

Conclusion

Swyer syndrome or 46 XY complete gonadal dysgenesis, represents a diagnostically challenging yet clinically significant etiology of primary amenorrhea. This condition necessitates a high index of suspicion among gynecologists, particularly when evaluating phenotypic females presenting with delayed puberty and absent secondary sexual characteristics. Early and accurate diagnosis, facilitated by a combination of clinical evaluation, imaging, and cytogenetic analysis, is critical to initiate appropriate management. Prophylactic gonadectomy remains essential due to the well-documented risk of gonadoblastoma and other germ cell tumors. Timely initiation of estrogen replacement therapy is vital for the development of secondary sexual characteristics, optimisation of boner mineral density, and long-term cardiovascular health. This case highlights the role of gynecologist within a multidisciplinary care team, encompassing endocrinology, genetics, reproductive medicine, and psychological support. Continued documentation and analysis of such cases are imperative to enhance understanding of the condition's phenotypic variability and management.

Declarations

Funding Disclosure: This research received no specific grant from any funding agency.

Conflict of interest: The authors declare no conflicts of interest.

Informed consent: Written informed consent was obtained from the patient and is available upon request.

Author contributions: K Subbarayudu drafted the manuscript and reviewed the literature; J Amu contributed to case management and manuscript revision.

References

1. Swyer GI. Gonadal dysgenesis. BMJ. 1957 Jun 15;1(5032):1421–1421. *doi:10.1136/bmj.1.5032.1421-a [Crossref] [PubMed][Google Scholar]*

2. Sandilya U, Jha S. Swyer Syndrome: A rare cause of primary amenorrhea. Journal of Rare Diseases. 2023 Sept 1;2(1). *[Crossref][PubMed][Google Scholar]*

3. Lee PA, Houk CP, Ahmed SF, Hughes IA. Consensus statement on management of Intersex Disorders. Pediatrics. 2006 Aug 1;118(2). *doi:10.1542/peds.2006-0738 [Crossref][PubMed] [Google Scholar]*

4. Piazza MJ, Urbanetz AA. Germ cell tumors in dysgenetic gonads. Clinics. 2019;74. *doi:10.6061/clinics/2019/e408 [Crossref][PubMed] [Google Scholar]*

5. McCann-Crosby B, Gunn S, Smith EO, Karaviti L, Hicks MJ. Association of immunohistochemical markers with premalignancy in gonadal dysgenesis. International Journal of Pediatric Endocrinology. 2015 Jun 15;2015(1). *doi:10.1186/s13633-015-0010-6 [Crossref][PubMed][Google Scholar]*

6. Gourlay WA, Johnson HW, Pantzar JT, McGillivray B, Crawford R, Nielsen WR. Gonadal tumors in disorders of sexual differentiation. Urology. 1994;43(4):537-540. *doi:10.1016/0090-4295(94)90251-8 [Crossref][PubMed][Google Scholar]*

7. Michala L, Creighton SM. The XY female. Best Practice & Research Clinical Obstetrics & Gynaecology. 2010 Apr;24(2):139–48. *doi:10.1016/j.bpobgyn.2009.09.009 [Crossref] [PubMed][Google Scholar]*

8. Cools M, Drop SL, Wolffenbuttel KP, Oosterhuis JW, Looijenga LH. Germ cell tumors in the intersex gonad: Old paths, New Directions, moving frontiers. Endocrine Reviews. 2006 May 30;27(5):468–84. *doi:10.1210/er.2006-0005 [Crossref][PubMed][Google Scholar]*

9. Bannour I, Bannour B, Ferjani S, Boughizane S. Swyer Syndrome: A diagnostic challenge. JBRA Assisted Reproduction. 2025 Mar;29(1):195–8. *doi:10.5935/1518-0557.20240096 [Crossref][PubMed][Google Scholar]*

10. Klein KO, Phillips SA. Review of Hormone Replacement therapy in girls and adolescents with hypogonadism. Journal of Pediatric and Adolescent Gynecology. 2019 Oct;32(5):460–8. *[Crossref][PubMed][Google Scholar]*

11. King TFJ, Conway GS. Swyer syndrome. Current Opinion in Endocrinology, Diabetes & Obesity. 2014 Dec;21(6):504–10. *doi:10.1097/med.0000000000000113 [Crossref][PubMed][Google Scholar]*

12. Krygere L, Bartasiene R, Kozlovskaja–Gumbriene A, Drejeriene E. Infertility management in a patient with Swyer Syndrome: A case report. Journal of Assisted Reproduction and Genetics. 2025 Mar 18;42(5):1689–95. *[Crossref][PubMed][Google Scholar]*

13. Mallari PM, Carlos-Navarro SL. Swyer syndrome (46, XY complete gonadal dysgenesis). Philippine Journal of Obstetrics and Gynecology. 2022 Nov;46(6):258–64. *doi:10.4103/pjog.pjog_48_22 [Crossref][PubMed][Google Scholar]*

14. Crerand CE, Shehata A, Umbaugh H, Kapa HM, Hansen-Moore J, Nahata L, et al. Body image and Psychosocial Outcomes in youth and young adults with differences of sex development: A multi-method study. Journal of Pediatric Psychology. 2024 Jun 12;49(7):512–23. *doi:10.1093/jpepsy/jsae041 [Crossref][PubMed][Google Scholar]*