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Original Article

Short-term Outcomes of Feminizing Genitoplasty in Children with Congenital Adrenal Hyperplasia: A Five-year Prospective observational study

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Abstract

Aims/objectives: To find out the beneficial outcomes of early feminizing surgery in patients with DSD due to CAH with virilization. By assessing pre & post operative anatomy, cosmesis & parental satisfaction.

Methods: This prospective observational study included 25 patients (aged 2year-11 years) of CAH with virilizationwho were clinically optimized pre-operatively. Feminizing genitoplasty of these patients were carried out in various Department of Paediatric Surgery in three centers. The study is being conducted with the intention of observing the short-term outcome. Patients were selected by purposive sampling from January 2021 to October 2025, over a period of 5 years.

Results: The mean age of the study subject was 6.29±2.3 years. The mean value of cosmetic outcome score was 8.4 on a 10-point scoring system. According to the outcome evaluation: 3 patients (12%) had excellent results, 7 patients (28%) had very good results, 11 patients (44%) had good results, and 4 patients (16%) had fair results. Postoperatively, among the 25 patients: 18 patients (72%) achieved Prader score 0, 11 patients (44%) had clitoral index >1, and 14 patients (56%) had clitoral index <1. No postoperative complications were observed. Parental satisfaction, assessed by likert scale, was 100% among all participants.

Conclusion: Early feminizing genitoplasty showed satisfactory cosmetic & anatomical outcomes with high parental satisfaction and minimal complications.

Keyword: Congenital Adrenal Hyperplasia, Feminizing Genitoplasty

Abbreviation: DSD- Disorders of sex development.
CAH- Congenital adrenal hyperplasia.

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Introduction

Congenital Adrenal Hyperplasia (CAH) is an autosomal recessive disorder affecting adrenal steroid synthesis, with an incidence of approximately 1 in 10,000 live births. The majority of neonates presenting with ambiguous genitalia fall into this category. All patients have a 46,XX karyotype and exclusively ovarian tissue in non-palpable gonads.[1] CAH most commonly results from mutation in the CYP21 gene encoding the steroid 21 hydroxylase, which accounts for more than 95%of cases. This deficiency leads to reduced cortisol and aldosterone production, accompanied by excess androgen secretion.[2,3]

CAH is classified into classic & non-classic forms. The classic type includessalt wasting &simple virilizing. Infants with classic CAH typically present at birth with virilized external genitalia, necessitating surgical correction to create female-appearing genitalia and alleviate future psychological distress. The non-classic form demonstrates late-onset virilization after birth. Current clinical guidelines recommend considering

clitoral and vaginal reconstruction in infancy when Prader scale ≥ 34.

The primary goal of early feminizing genitoplasty is to restore normal external genital anatomy and reduce the psychological burden on both the child and the parents. Earlyreconstruction can promote appropriate psychosexual development, reduce anxiety, and facilitate positive parenting by minimizing social stigma and confusion regarding gender identity.

Materials & method

This was a five-year prospective observational study conducted from January 2021 to October 2025inthree centers in Dhaka -DMCH, BSMMU (BMU), BSHI. A total of 25 patients, aged 2-11 years, with virilizing CAH were included by purposive sampling after obtaining ethical approval.

The procedure was explained in simple words to parents. Initially diagnosis of CAH was confirmed by biochemical test and imaging studies including blood glucose, serum electrolyte, serum 21-hydroxylase, serum 17-hydroxyprogesteron, USG of pelvic organ & karyotyping. Patient was clinically optimized preoperatively. Then severity of virilization was assessed by using the Prader classification.

All patients underwent feminizing genitoplasty under general anesthesia by experienced pediatric surgeons. The surgical techniques included clitoroplasty/ labioplasty/vaginoplasty as required. Cystoscopic evaluation was performed prior to surgery.

Post operative evaluations were conducted at 15 days, 1 month, and 3 months.Assessments included cosmetic appearance, anatomical configuration, and parental satisfaction. Cosmetic appearance was scored on a 10-point scale by an independent pediatric surgeon not involved in the procedure. Anatomical evaluation was performed by same examiner by prader score & clitoral index. Parental satisfaction was measured using likert scale. All the Data were recorded systematically and analyzed using SPSS software.satistical significance was set at $p< 0.05$.

Result

The mean age of the patients was 6.29±2.3 years. The mean value of cosmetic outcome score was 8.64 on a 10-point scoring system. According to the outcome evaluation: 3 patients (12%) had excellent results, 7 patients (28%) had very good results, 11 patients (44%) had good results, and 4 patients (16%) had fair results. Postoperatively, among the 25 patients: 18 patients (72%) achieved Prader score 0, 11 patients (44%) had clitoral index >1, and 14 patients (56%) had clitoral index <1. No postoperative complications were observed. Parental satisfaction, assessed by Likert scale, was 100% among all participants.

1 patient experienced wound site infection & another experienced vaginal discharge on 15th day follow up. On 1st month follow up 1 patient found with vaginal stenosis which required vaginal dilatation & another one patient complained UTI with vaginal discharge which has been treated conservatively.

Figure 1: Diagram showing Cosmetic outcome

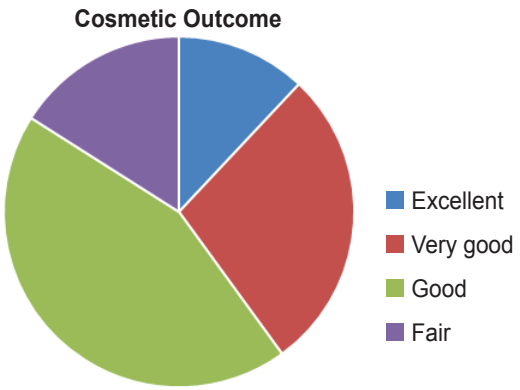


Fig1: Among all studied patients (N=25) 44% results Good, 12% Excellent, 28% Very good,& rest 16% results in fair outcome

Table I: Result of cosmetic Outcome

Remark*	Point score	Mean
Fair[4]	7	
Good[11]	8	8.64
Very Good[7]	9	
Excellent[3]	10	

*Number of patients was remarked as Fair, Good, Very Good, Excellent

Among all studied patients (n=25) Mean of cosmetic outcome evaluate between Good & Very Good .

Table II: Results of Anatomic examination

Anatomic Outcome		
Clitoral symmetry	Symmetrical	20(80%)
	Assymmetrical	5(20%)
Vaginal length	Mean length (cm)	2.9
Clitoral index	<1 cm^2	9(36%)
	>1 cm^2	16(64%)
Labial position	Normal	17(68%)
	Abnormal	8(32%)
General skin quality	Normal	4(16%)
	Pigmented	9(36%)
	Scarred	12(48%)

Table III:

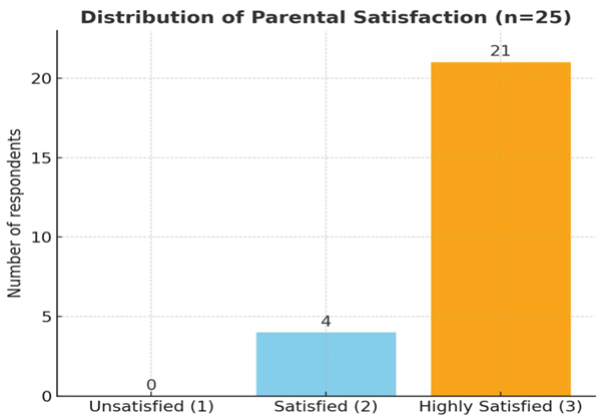
Parameter	Pre operative Mean±SD Value	Postoperative Mean±SD value	P-Value
Prader Score	2.7	0.28	<0.0001

Table IV:

Parameter	Pre operative Mean±SDValue	Postoperative Mean±SD value	P-Value
Clitoral Index (cm^2)	4.25	0.96	<0.0001

Result clitoral index are expressed by Students t-Test (N=25). Here P <0.05 is considered significant

Figure 2: Visual analog Scale for parental satisfaction



Discussion

The role of feminising surgery in disorders of sex development has been a topic of intense discussion for many years5. This prospective study demonstrates that early feminizing genitoplasty in children with CAH results in satisfactory short-term anatomical and cosmetic outcomes, with high parental satisfaction with minimal complications. These findings support the current understanding that early surgical correction can prevent psychosocial distress and promote normal gender identity development.

This results align with previous studies reporting favourable cosmetic outcomes following early genitoplasty. However, they contrast with the findings of Creighton et al. (2001), who observed poor cosmetic results in 41% of patients and suggested delaying surgery until adolescence. Our study showed good-to-excellent results in 84% of patients, with only mild complications.

Although this study did not assess clitoral sensation or long-term psychosexual outcomes, previous literature6,7suggests that improper surgical technique may affect clitoral innervations and orgasmic function. Further follow-up studies are essential to evaluate these parameters.

Limitations include small sample size, short follow-up, and subjective assessment of cosmetic results.

Conclusion:

Early feminizing genitoplasty in children with CAH offers satisfactory short-term anatomical and cosmetic outcomes, high parental satisfaction, and minimal complications. Larger studies with long-term follow-up are recommended to assess long-term functional and psychological outcomes.

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