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FREQUENCY AND FACTORS LEADING TO DELAYED PRESENTATION OF UNDESCENDED TESTIS AT TERTIARY CARE HOSPITAL, KARACHI

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Abstract

Objective & Background: *Delayed presentation of undescended testis (UDT) remains a significant concern despite clear guidelines recommending orchiopexy within the first year of life. This study aimed to determine the frequency of delayed presentation and explore contributing factors at a tertiary care hospital in Karachi.* ***Material & Methods:*** *A cross-sectional study was conducted at the Department of Paediatric Surgery, National Institute of Child Health, Karachi, from January to June 2025. A total of 122 children with UDT were enrolled. Demographic details, parental awareness, health-seeking behavior, and provider-related factors were documented. Statistical tests were applied to assess associations between delay and socio-demographic or clinical variables.* ***Results:*** *The median age at presentation was 36 months (IQR: 23–57). Most patients resided in urban areas (63.9%), and 82% of families earned less than 50,000 PKR monthly. Mothers identified the condition in 82.8% of cases. Unilateral UDT was predominant (91.8%), with right-sided involvement in 71.3%. Reported reasons for delay included belief in spontaneous descent (17.2%), advice to wait without a timeline (12.2%), lack of awareness (6.6%), and noncompliance with prior advice (11.5%). Healthcare-related delay due to previous providers occurred in 8.2% of cases. None of the socio-demographic or clinical variables, including income, maternal education, or testis location, were significantly associated with delay.* ***Conclusion:*** *Nearly one-quarter of children with UDT presented late. Misconceptions, inconsistent advice, and poor awareness were the key contributors. Improved community education and stricter adherence to referral guidelines are essential to reduce avoidable delays and improve outcomes.*

INTRODUCTION

Cryptorchidism is the most common endocrine disorder in male pediatrics. The term originates from Greek, meaning "hidden testis," and refers to a testicle that fails to descend into the scrotum or takes an abnormal path during descent.[1] It affects 2–4% of full-term boys, declining to ~1% by 6–12 months of age, with spontaneous descent beyond infancy being rare.[2] Normal testicular growth and spermatogenesis require a scrotal temperature 3–4°C lower than body temperature.[3] Risk factors include low birth weight, small-for-gestational-age status, prematurity, and maternal estrogen exposure during pregnancy.[4] A family history is present in up to 23% of cases.[5]

Evaluation depends on whether the testes are palpable. It has been noted that around 80% are palpable, while 20% remain non-palpable—either

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intra-abdominal or absent. Palpable testes may be undescended, ectopic, or retractile.[6] A careful physical examination remains the cornerstone of diagnosis. While medical therapy using gonadotropin-releasing hormone (GnRH) or human chorionic gonadotropin (hCG) has been explored, surgical orchiopexy remains the gold standard. Any testis undescended beyond 6 months warrants referral for surgery, as persistent UDT can impair spermatogenesis and increase cancer risk, even after successful treatment.[7–8]

Timely orchiopexy between 6–12 months is critical to reduce germ cell loss and safeguard fertility potential. Delayed descent is associated with poor semen quality and a higher likelihood of germ cell tumors.[9] This risk increases particularly when gonocytes mature into Ad spermatogonia.[10–11] Despite recognition of infertility risks for decades, late presentation continues.[12–13] Although referral by 6 months is strongly recommended, many children still present beyond this age.[14]

With male infertility becoming increasingly prevalent in South Asia, cryptorchidism remains an under-reported contributor.[15] International studies echo this same exact concern; for example, Ekwunife et al. reported delayed presentation in 28% of patients.[16] UDT, one of the most common congenital anomalies in male infants, carries significant implications for reproductive and oncological health. Early recognition and timely orchiopexy remain central to optimizing long-term outcomes. However, persisting misconceptions, cultural beliefs, and healthcare system gaps continue to contribute to delayed referral and management, underscoring the need for better awareness and guideline adherence.

MATERIAL & METHODS:

This cross-sectional study was conducted in the Department of Paediatric Surgery, National Institute of Child Health (NICH), Karachi, from January to June 2025, following approval from the Institutional Ethical Review Board (IERB No.: 40/2025). Children presenting with undescended testis (UDT) during the study period were consecutively enrolled. All male children aged 1–14 years presenting to the outpatient department with clinically and ultrasonographically confirmed undescended testis were included in the study. Both unilateral and bilateral cases were enrolled. Cases associated with major congenital anomalies, syndromic disorders, hematological or neoplastic diseases, or those who had undergone prior surgical intervention for UDT were excluded. The sample size was calculated using WHO sample size determination software, taking the prevalence of delayed presentation of undescended testis as 28%, with a 95% confidence level and a margin of error (d) of 8%. The required sample size was thus determined to be 122 patients.

Patients meeting the inclusion criteria and presenting at the National Institute of Child Health, Karachi, were recruited. A brief history, including demographic details such as age, gender, and place of residence (Rural/urban), were recorded. Written informed consent in the local language was obtained from each participant's guardian. Information regarding the diagnosis of undescended testis, including whether presentation was delayed based on the operational definition, was documented. Factors contributing to delayed presentation were assessed according to predefined criteria. All relevant findings related to study variables were recorded using a predesigned, structured proforma, which included demographic characteristics (age at presentation, residence—urban or rural, family monthly income, and maternal educational level), clinical details (laterality, side, and testicular position on ultrasound, and whether the condition was first identified by a family member or doctor), and parental or physician-related causes of delay (belief in spontaneous descent, advice to wait, lack of awareness, or noncompliance with medical advice). Parental delay was defined as presentation or referral beyond twelve months of age, in accordance with current international guidelines. Family income was categorized as <50,000 PKR or ≥50,000 PKR per month, while maternal education was classified as illiterate, primary, secondary, or higher.

Data were analyzed using SPSS (Version 22). Quantitative variables such as age were expressed as mean ± standard deviation (SD) if normally distributed, tested by the Kolmogorov–Smirnov test, and as median with interquartile range (IQR) if not normally distributed. Qualitative variables, such as gender, place of residence, family monthly income, educational status, and delayed presentation (Yes/No), were summarized as frequencies and

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percentages. To evaluate the influence of potential effect modifiers, stratification was performed based on age, gender, residence, family income, and maternal education. Post-stratification analysis was conducted using the Chi-square test and/or Fisher's Exact test where appropriate, with a p-value ≤ 0.05 considered statistically significant.

RESULTS:

A total of 122 children with undescended testis were enrolled, with a median age at presentation of 36 months (IQR: 23–57). The majority resided in urban areas (n=78, 63.9%), and most families reported a monthly income below 50,000 PKR (n=100, 82%). One-third of mothers were illiterate, while only 6.6% had higher education. In most cases, the condition was first noticed by the mother (n=101, 82.8%). Unilateral involvement was predominant (n=112, 91.8%), with the right side more frequently affected (n=87, 71.3%). Parental factors contributing to delayed presentation included belief in spontaneous descent (n=21, 17.2%), being advised to wait without a timeline (n=12, 12.2%), lack of awareness until presentation (n=8, 6.6%), and noncompliance to medical advice (n=14, 11.5%). Delay attributable to previous healthcare providers was reported in 8.2% (n=10) of cases. On ultrasound, 82.8% (n=101) of testes were located in the inguinal region, while 17.2% (n=21) were intra-abdominal. As shown in the Table 1 below.

Table 1: Characteristics of Participants	
Age in Months	
Median (IQR)	36 (23-57)
Min-Max	12-120
Total	122 (100)
Place of Residence	
Urban	78 (63.9%)
Rural	44 (36.1%)
Monthly Income	**n** (%)
<50,000	100 (82%)
>50,000	22 (18%)
Mother Education Level	**n** (%)
Illiterate	39 (32%)
Primary (Class 1-5)	29 (23.8%)
Secondary School (Class 6 to Matric)	46 (37.7%)
Higher (Intermediate to Graduation)	8 (6.6%)
UDT Noticed BY	**n** (%)
Mother	101 (82.8%)
Father	5 (4.1%)
Grand Mother	9 (7.4%)
Doctor	7 (5.7%)
Laterality of Condition	**n** (%)
Unilateral	112 (91.8%)
Bilateral	10 (8.2%)
Side of Involvement	**n** (%)
Right	87 (71.3%)
Left	25 (20.5%)

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Both	10 (8.2%)
Laterality of Condition	**n** (%)
Unilateral	112 (91.8%)
Bilateral	10 (8.2%)
Parental Belief About Spontaneous Testicular Descent	**n** (%)
No	101 (82.8%)
Yes	21 (17.2%)
Advised to Wait Without Timeline	**n** (%)
No	108 (87.8%)
Yes	15 (12.2%)
Parental Awareness Before Presentation	**n** (%)
No	114 (93.4%)
Yes	8 (6.6%)
Noncompliance to the advise	**n** (%)
No	108 (88.5%)
Yes	14 (11.5%)
Healthcare-Related Delay (Previous Provider)	**n** (%)
No	112 (91.8%)
Yes	10 (8.2%)
Testis Position in US	**n** (%)
Inguinal	101 (82.8%)
Intra-abdominal	21 (17.2%)

Among the 122 participants, 28 (23%) experienced parental delay in presentation. No significant association was found between place of residence and parental delay (urban: 67.9% vs. 62.8% in no-delay group, p=0.622). Similarly, monthly income did not significantly affect parental delay, with delay observed in 25% of families earning >50,000 PKR compared to 21% among those earning <50,000 PKR (p=0.275).

Maternal education level showed a trend but was not statistically significant. Delay was more frequent among children of illiterate mothers (42.9% vs. 28.7% without delay), while those with mothers educated up to secondary school or higher showed comparatively less delay (p=0.488).

Ultrasound findings also did not demonstrate a significant difference; intra-abdominal testes were present in 14.3% of the delay group and 18.1% of the no-delay group (p=0.64).

Overall, none of the examined sociodemographic or clinical factors were statistically associated with parental delay in presentation. As shown in the

Table2 : Table 2: Factors Associated with Parental Delay			
	No **n** (%)	**Yes** **n** (%)	**P value**
Place of Residence			
Urban	59 (62.8)	19 (67.9)	0.622, ∫
Rural	35 (37.2)	9 (32.1)	
Total	94 (100)	28 (100)	

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monthly Income			
<50000	79 (84)	21 (75)	0.275‡
>50000	15 (16)	7 (25)	
Total	100 (82)	22 (18)	
Mother education level			
Illiterate	**27 (28.7)**	**12 (42.9)**	0.488‡
Primary (Class 1-5)	**24 (25.5)**	**5 (17.9)**	
Secondary School (Class 6 to Matric)	36 (38.3)	10 (35.7)	
Higher (Intermediate to Graduation)	7 (7.4)	1 (3.6)	
Total	94 (100)	28 (100)	
Testicular Position on US			
Inguinal	77 (81.9)	24 (85.7)	0.64, ∫
Intra-abdominal	17 (18.1)	4 (14.3)	
Total	94 (100)	28 (100)	
‡ Fisher's Exact, ∫Pearson Chi-square. All the data were expressed in n (%)			

DISCUSSSION:

In the present study, the median age at presentation was 36 months, indicating a considerable delay compared to the recommended age for orchidopexy within the first 6 to 12 months of life. This finding aligns with other regional studies highlighting late diagnosis and intervention as persistent challenges in developing countries despite growing awareness of the long-term implications of delayed management, such as infertility and malignancy risks.[17,18]

The majority of participants were from urban areas; however, residence did not significantly influence delay in presentation. Similar observations have been made in local and regional literature, where even families in urban centers showed poor awareness regarding the appropriate timing of surgical correction.[19,20] This suggests that socio-cultural factors, rather than mere accessibility to healthcare, may play a more defining role.

Maternal education level demonstrated a trend toward association with delayed presentation, as children of illiterate mothers had higher rates of delay. Although the relationship was not statistically significant, this finding resonates with prior research emphasizing the impact of parental education on health-seeking behavior.[21,22] In most cases, the mother first identified the undescended testis, underscoring the importance of maternal awareness programs to promote early recognition and timely referral.

Parental misconceptions, particularly the belief in spontaneous testicular descent and the tendency to follow non-specialist advice to "wait," were major contributors to delay in this study. These patterns are consistent with previous studies from Pakistan and neighboring countries, where misinformed reassurance by general practitioners further compounded parental hesitation.[23,24] Enhancing pediatricians' and general practitioners' understanding of cryptorchidism management guidelines could mitigate such delays.

Interestingly, the position of the undescended testis on ultrasound (inguinal versus intra-abdominal) did not significantly correlate with presentation timing, consistent with findings reported by Barthold and Gonzalez.[25] This suggests that anatomical severity alone does not drive healthcare-seeking behavior; instead, sociocultural awareness and physician counseling appear to be more decisive.

Overall, the results emphasize that delayed presentation of UDT in our population remains largely a preventable issue. Public health interventions focusing on parental education, community awareness, and physician training are essential to improve early detection and reduce the long-term complications associated with this condition.[26]

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CONCLUSION:

Nearly one-fourth of children in the study presented late with undescended testis, reflecting persistent gaps in early detection and referral despite available healthcare access. The absence of significant associations with socioeconomic or clinical variables suggests that deficient awareness and inappropriate reassurance regarding spontaneous descent remain the predominant contributors to delay. Strengthening parental counseling, empowering primary care physicians through guideline-based training, and integrating routine genital examination into early childhood health visits are critical to ensuring timely orchidopexy and preventing avoidable long-term sequelae.

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