



ORIGINAL RESEARCH PAPER

General Surgery

A STUDY ON THE PRESENTATION AND MANAGEMENT OF UNDESCENDED TESTIS AT A TERTIARY CENTRE IN MANIPUR

KEY WORDS:undescended Testis, Orchidopexy, Orchiectomy, Laparoscopy

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ABSTRACT	Background:Undescended testes is the most common congenital genitourinary anomaly found in children and is associated with complications such as infertility, malignancy, torsion if not treated early. Despite established guidelines recommending early intervention, delayed presentation remains common in many regionsAim: To evaluate the clinical presentation, management patterns and correlation between preoperative imaging and intraoperative findings in patients with undescended testes Method:A single centre cross sectional study was conducted in the Department of General Surgery, Jawaharlal Nehru Institute of Medical Sciences, Imphal, from March 2024 to February 2026. A total of 53 patients diagnosed with undescended testes were included in the study. Detailed history, clinical examination and relevant imaging studies were performed. Patients were categorised based on palpability and managed accordingly with either open or laparoscopic orchidopexy or orchiectomy.Results: Among 53 patients, 84.9% had palpable and 15.1% had non-palpable testes. The median age at presentation was 4 years, with the majority (32.1%) presenting between 1–3 years. Absence of testis in the scrotum (66%) was the most common presentation. Right-sided UDT was most frequent (49.1%), followed by left (35.8%) and bilateral (15.1%). Intraoperatively, the inguinal canal was the most common location (64.1%). Ultrasonography was the most commonly used imaging modality (88.7%), though discrepancies with operative findings were noted. Most palpable testes underwent single-stage orchidopexy, while non-palpable testes required laparoscopic evaluation and staged procedures. The association between age and palpability was statistically significant ($p < 0.001$). A highly significant association was also observed between imaging and operative findings.Conclusion: Delayed presentation of undescended testis remains a significant issue. Clinical examination remains the cornerstone of diagnosis, with limited additional value from imaging. Early diagnosis and timely surgical intervention are essential to prevent long-term complications. Strengthening awareness and referral systems is crucial to ensure adherence to recommended management timelines.
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INTRODUCTION Undescended testis (cryptorchidism) is defined as the failure of one or both testes to descend into the scrotum along the normal pathway of descent and represents the most common congenital genitourinary anomaly in male infants ¹. Testicular descent is a complex developmental process that is usually completed by the 35th week of gestation ². In most cases, spontaneous descent occurs within the first 3 months of life; however, descent after 6 months is uncommon and persistence beyond this period is unlikely to resolve spontaneously The incidence of undescended testes is approximately 1–4% in term infants and up to 45% in preterm neonates, with a higher predominance of unilateral involvement particularly on right side ^(3,4). The etiology is multifactorial, involving anatomical, hormonal, and genetic factors. Disruptions in the hypothalamic-pituitary-gonadal axis, abnormalities in the gubernaculum and genetic mutations affecting androgen signalling and INSL3 pathways have all implicated. ^(5,6,7). Clinically, undescended testes are classified based on palpability, anatomical location, laterality and etiology (congenital or acquired). Early diagnosis and timely management are crucial due to the	associated complications. Undescended testes are associated with impaired spermatogenesis, infertility, malignancy, torsion, and inguinal hernia ^(8,9). The risk of testicular cancer is significantly higher especially in bilateral and intra-abdominal testes and decreases with early surgical correction ¹⁰ Diagnosis is mainly clinical, and imaging is not routinely advised due to limited utility and as it rarely alters management ^(11,12,13) . Surgical intervention remains the definitive treatment with techniques tailored based on palpability. Despite guidelines, delayed presentation and variability in management practices continue to be observed. Also, there is a limited data from our institution regarding the presentation and management patterns. Hence, this study was undertaken to evaluate these aspects in patients presenting to our institute. MATERIAL AND METHODS Source of data A cross-sectional study was carried out on patients admitted to Jawaharlal Nehru Institute of Medical Sciences, Imphal Dept. of Surgery during the study duration Methods of data collection From the above sources, 53 cases who fulfilled the inclusion and exclusion criteria were included in the study
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Inclusion criteria

- Patients diagnosed with undescended testes
- Patients willing for surgery

Exclusion criteria

- Patients with retractile testes and ectopic testes
- Patients not willing or unfit for surgery

All informed consent was taken. Careful history was taken and examination of the patients were done under supine position. Findings regarding side, palpability, position and possible associated findings such as hydrocele, hypospadias, phimosis were documented

All patients underwent ultrasonography of inguinal and scrotal region to confirm the examination findings and also to see the size of the testes. Impalpable testes and those which cannot be visualized on ultrasound were subjected to MRI/NCCT pelvis.

All patients with inguinal undescended testes underwent open orchidopexy. Patients with intra- abdominal testes underwent diagnostic laparoscopy and Fowler Stephens two stage orchidopexy were done. Atrophied testes or those presented late underwent orchidectomy with open or laparoscopic approach depending on the location. Intra operatively, the location of the testes were noted and comparison was done with pre- operative imaging

All data were entered on a personal computer in microscope excel and then were transferred in SPS version 22 software and then analysed.

RESULTS

In this study, a total of 53 patients with undescended testes were evaluated. The median age at presentation was 4 years.

84.9% had palpable and 15.1% had non-palpable testes All infants had palpable testes, whereas non palpable testes were predominantly seen in patients older than 10 years (75%).

Right sided undescended testes (49.1%) were more commonly seen followed by left sided (35.8%) and bilateral involvement (15.1%). The most common clinical presentation in this study was absence of testes in scrotum, observed in 66% of patients. This was followed by painless inguinal swelling (32.1%) while painful inguinal swelling was rare (1.9%). Ultrasonography was the most commonly used imaging modality performed in 88.7% of patients followed by MRI (9.4%) and CT (1.9%).

Intra-operatively, inguinal canal was the most common location of undescended testes (64.1%) followed by superficial inguinal ring (20.7%), deep inguinal ring (7.5%) and intra-abdominal position (7.5%). A highly significant association ($p<0.001$) was observed between imaging findings and operative findings. Majority of patients underwent open single stage orchidopexy (88.7%). Fowler-Stephen's two- stage orchidopexy was required in 3.8% of cases, primarily for high intra-abdominal testes.

Scrotal edema was the most common complications (15.1%) followed by hematoma (5.7%). No cases of surgical site infection were recorded.

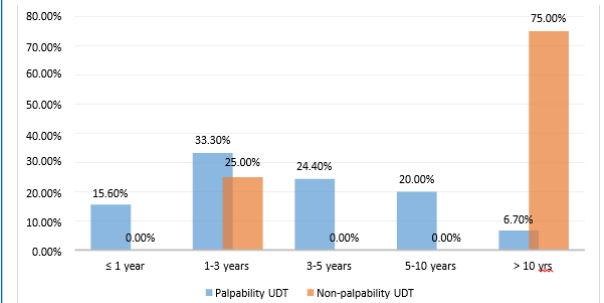


Fig 1: Multiple Bar diagram shows distribution of palpability & non-palpability UDT patients according to their age category.

Table 1: Distribution of clinical presentation of patients with undescended testes according to their ages

Criteria of Clinical Presentation		UDT		Total N(%)	P-VAL UE
		Palpable n (%)	Non-palpable n (%)		
Age	≤ 1 year	7(15.6)	0	07(13.2)	<.001**
	1-3 years	15(33.3)	02(25.0)	17(32.1)	
	3-5 years	11(24.4)	0	11(20.8)	
	5-10 years	9(20.0)	0	9(17.0)	
	>10 years	3(6.7)	06(75.0)	9(17.0)	
Total	45 (100)	08(100)	53(100)		

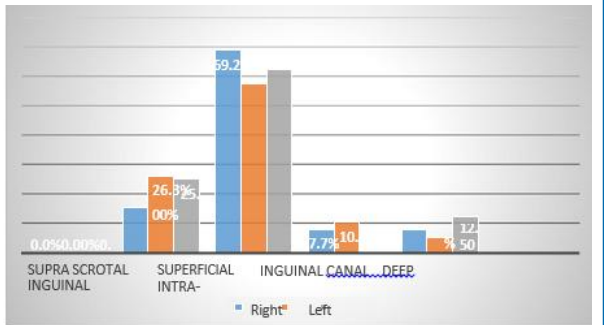


Fig. 2: Bar-chart shows the distribution of Intra-operative finding of undescended testis according to their side of undescended testis

Table 2: The association of pre-operative ultrasound imaging and intra operative findings of undescended testes

Pre- operative ultrasound imaging Finding	Intra operative finding N (%)					Total	P-VAL UE
	Supra scrotal	Superficial inguinal ring	Inguinal canal	Deep inguinal ring	Intra-abdominal		
Supra scrotal	0	2(100)	0	0	0	02	<.001**
Superficial inguinal ring	0	8(88.9)	1(11.1)	0	0	9	
Inguinal canal	0	0	30(100)	0	0	30	
Deep inguinal ring	0	0	2(33.3)	4(66.7)	0	06	
Intra- abdominal	0	0	0	0	0	00	
Not visualised	0	1(16.7)	1(6.7)	0	4(66.7)	06	
Total	0	11(20.8)	34(64.2)	4(7.5)	4(7.5)	53	



Image 1: Intra-op image of intra-abdominal undescended testes located near deep inguinal ring



Image 2: Laparoscopic port positions in orchidopexy and orchidectomy

DISCUSSION

Undescended testes remains one of the most common congenital anomaly encountered in paediatrics age group with important implications for fertility, malignancy risk and psychosocial development.

This study evaluates the clinical profile, imaging findings, intra-operative localization and surgical outcomes of patients with undescended testes

In this study, a total of 53 patients with undescended testes were evaluated. The median age at presentation was 4 years, with a wide range extending from 2 months to 22 years, indicating delayed referral and diagnosis in a significant proportion of patients.

Although 13.2% of patients presented within the first year of life, majority were diagnosed beyond infancy, with 32.1% presenting between 1-3 years and 20.8% between 3-5 years.

A similar study by Mallikarjuna et al¹⁴ also shows that maximum cases were in age group 1-3 years which is consistent with our study.

A statistically significant association was observed between age and palpability of UDT. All infants had palpable testes, whereas non palpable testes were predominantly seen in patients older than 10 years (75%). This finding suggests that delayed presentation is associated with a higher likelihood of proximal testicular position or intra-abdominal location, possibly due to progressive testicular ascent or secondary atrophy over time.

Similar trends have been reported in previous studies, where delayed diagnosis was associated with increased rates of non-palpable and intra-abdominal testes. International guidelines recommend orchidopexy between 6 and 18 months of age, yet delayed intervention remains common in developing regions reflecting gaps in awareness, referral systems and access to paediatric surgical care

This study demonstrated a predominance of right sided undescended testes (49.1%), followed by left sided (35.8%) and bilateral involvement (15.1%). This right sided predominance is consistent with embryological explanations related to delayed right testicular descent.

Shariff N et al¹⁵ in their study also shows that most of the cases were of right sided (43.9%), 21.9% were bilateral.

The most common clinical presentation in this study was absence of testes in scrotum, observed in 66% of patients. This was followed by painless inguinal swelling (32.1%) while painful inguinal swelling was rare (1.9%). These findings align with existing literature, where painless scrotal emptiness remains the classical presentation of undescended testes and pain is typically associated with torsion or hernia. Study by Steven G et al¹⁶ also shows that most common clinical presentation was absence of testes in the scrotum

Intra-operatively, inguinal canal was the most common location of undescended testes (64.1%) followed by superficial inguinal ring (20.7%), deep inguinal ring (7.5%) and intra- abdominal position (7.5%). No cases of supra-scrotal testes were identified.

This distribution closely mirrors findings reported in large series, where majority of UDTs are located distal to the internal ring. Bilateral cases showed a slightly higher proportion of proximal locations, consistent with other studies suggesting a more severe embryological defect in bilateral UDT.

Steven Kadilo et al¹⁷ reported that 52.9% were inguinal and 7.8% intra-abdominal

Hadziselimovic¹⁸ also reported that intra-canalicular (63%) was the most common location of undescended testes and 8% were intra-abdominal

In this study, a highly significant association ($p < 0.001$) was observed between imaging findings and operative findings. Testes identified in the inguinal canal on imaging were confirmed intra-operatively in 100% of cases, demonstrating excellent accuracy for this location. Similarly, testes visualised at deep inguinal ring and superficial inguinal ring showed good concordance. However, in cases where testes was not visualised on ultrasound, intra-operative findings revealed deep inguinal or intra-abdominal locations, highlighting the limitations of ultrasonography for non-palpable testes.

Study by Sebastian Ekenze¹⁹ et al found out that 97.4% of undescended testes were accurately localized by ultrasound S Boopathy Vijayaraghavan²⁰ also shows that testes was localised by ultrasound in 94.9% cases

Majority of patients underwent open single stage orchidopexy (88.7%), reflecting the predominance of palpable and inguinal testes in this cohort. Fowler- Stephen's two- stage orchidopexy was required in 3.8% of cases, primarily for high intra-abdominal testes. Orchidectomy was performed in a small number of older patients with atrophic testes. Open surgery remains the predominant approach (92.5%) with laparoscopic surgery utilized selectively (5.7%), mainly for non-palpable or intra-abdominal testes. This approach is consistent with standard surgical practice, where laparoscopy is reserved for diagnostically challenging or high-lying testes.

In similar study by Mallikarjuna et al²¹, 93.4% underwent orchidopexy and 6.6% underwent orchidectomy Post-operative complications were minimal and predominantly minor.

CONCLUSION

Undescended testes is a common surgically correctable condition with delayed presentation still prevalent in clinical practice due to lack of awareness and delayed referral. Clinical examination with ultrasonography is effective in localization of palpable, inguinal testes, while MRI, diagnostic

laparoscopy remains essential for non- palpable cases.

Open single staged orchidopexy is a safe and effective procedure for palpable inguinal cases providing favourable outcomes with minimal complications.

Overall, this study reinforces the importance of early diagnosis, appropriate imaging and timely surgical intervention in the management of undescended testes. The findings support established surgical practices while highlighting the need for improved early referral and awareness to optimize long-term outcomes related to fertility and malignancy risk.

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