

## Original Research Article

# Comparison of various diagnostic and therapeutic modalities of undescended testis

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### ABSTRACT

**Background:** Undescended testes (UDT), which are defined as the failure of testes to descend in scrotum. It is the most common developmental defect in male infants. It is recorded in 30% of preterm infants compared with 3% of term infants.

**Methods:** Convenient sampling method for data collection, clinical palpation, ultrasound, magnetic resonance imaging (MRI), endoscopic ultrasound, laparoscopic methods for detection and therapeutic management.

**Results:** Laparoscopy has proven to be the only diagnostic modality where the findings provide a clear dependable direction for the definitive management of impalpable testes, so it allows an accurate diagnosis and definitive treatment in the same sitting.

**Conclusions:** Diagnostic imaging has no role in the routine evaluation of boys with undescended testes. Laparoscopy in impalpable testes is the procedure of choice and allows definitive management, even when conversion to open procedure is necessary.

**Keywords:** Undescended testis, USG, Laparoscopy

### INTRODUCTION

Undescended testis is the failure of testis to descent in scrotum.<sup>1</sup> The failure of the testicular descent can occur anywhere along the pathway. Previous studies have shown that ultrasound (USG) is the best imaging method to localize non palpable testes and it has advantages of being non - invasive and no radiation exposure.<sup>2-4</sup> Most UDT will descend spontaneously with age, but surgery is the most accepted treatment for those testes that remain undescended after 9 months of age.<sup>5-6</sup> Histological changes in UDT may not be reversed by orchidopexy and result in infertility or cancer.<sup>7-8</sup> Therefore, UDT requires early recognition due to the associated reduction in fertility and increased risk of malignancy.<sup>9</sup>

Current urology guidelines state that USG, computerized tomography (CT), and magnetic resonance imaging (MRI) do not provide any additional information to the physical examination of palpable testes.<sup>10</sup> However, USG is the most widely used imaging modality to evaluate UDT because of its easy availability and it is non-invasive. Over the past few decades, USG technology has advanced with newer transducers having a greater resolution power to distinguish testes from adjacent tissues.<sup>11</sup>

The endoscopic ultrasound (EUS) allows the assessment of tissue elastic properties, by using different techniques including strain EUS, shear wave EUS, and acoustic radiation force EUS.<sup>12</sup>

The aim of this study was to compare the various diagnostic and therapeutic modalities of undescended testis.

## METHODS

Study design is an evaluation of diagnostic test. Study setting include surgery ward tertiary care centre. Study duration is 2 years (from October 2018 to March 2020). Study population is the study population included all the cases with impalpable or intra-abdominal testis admitted at a tertiary care centre. Inclusion Criteria include all patients with impalpable or intra-abdominal testis.

Exclusion criteria include patients who are high risk for laparoscopy testicular repair, not willing to participate and fail to follow up sampling method and sample size is 40 by convenient sampling method is 40 convenient sampling technique used for data collection. Sampling technique is convenient sampling technique used for data collection. All patients admitted in surgery department tertiary care centre from Jan 2019 to Dec 2019. Methods of data collection and questionnaire are predesigned and pretested questionnaire was used to record the necessary information. Questionnaires included general information, such as age, sex, religion, occupation of parents, residential address, and date of admission. Medical history- chief complain, past history, general examination, systemic examination. Data on demographic profile USG, CT SCAN, MRI and laparoscopy findings, treatment modalities, and clinical outcome collected from surgery and radiology department and from patient files at the medical records department. Information on demographic characteristics, investigation findings, medical and/or surgical management and clinical outcome (transfusion requirements, length of hospital stay, complications) of all patients were recorded in a specially designed case recording proforma. USG, CT SCAN, MRI and laparoscopy was done in all cases of impalpable or intra-abdominal testes. Examination in infants and young children using a two-handed technique. Palpation took place in anxiety-free and warm surroundings, since cold or anxiety can cause the cremasteric reflex to retract the testicle. One hand stroke from the upper iliac spine along the inguinal canal towards the pubic bone, while the other hand attempts to palpate the testicle. With this manoeuvre it is frequently also possible to push the testicle towards the scrotum, causing it to become positioned at the outer inguinal ring. When the testicle is released, it immediately jumps from the upper scrotal compartment towards the inguinal canal (gliding testicle). In contrast, the retractile (hypermobile) testicle remains in the scrotum until the cremasteric reflex is triggered and only then does the testicle disappear in cranial direction. As an imaging technique, sonography with a high-resolution transducer (>7.5 MHz) provides a correct classification rate (accuracy) There was generally no need for diagnostic laboratory tests. For bilateral non-palpable testicles, a pediatric endocrinological assessment is indicated, among other things in order to rule out other syndromes. Detection

of testosterone-producing testicular tissue should precede surgical exploration and can be accomplished with the conventional human chorionic gonadotropin (hCG) stimulation test increases in luteinizing hormone (LH), follicle stimulating hormone (FSH) and the non-measurability of mullerian inhibiting substance (MIS) are suggestive of anorchia. Elevated gonadotropins and a negative intramuscular human chorionic gonadotropin (hCG) stimulation test without evidence of testosterone production reinforce this assumption. Final proof of anorchia, however, was provided by surgical exploration. Abdominal testis diagnosed by laparoscopy. A proforma drafted for the study of all patients with undescended testis used for data entry. Diagnosis was done by history and clinical features and in few cases of impalpable testis, ultrasound examination and diagnostic laparoscopy. The data were entered in microsoft excel and data analysis was done by using SPSS demo version no 21 for windows. The analysis was performed by using percentages in frequency tables and association of impalpable or Intra - abdominal testes with various factors and sensitivity and specificity of diagnostic tests.  $p < 0.05$  was considered as level of significance using the chi-square test.

## RESULTS

The Table 1 shows majority of cases found in the age group of above 60 months eg. 11 (27.5%). Followed by 37-48 months age group eg. 8 (20%), 25-36 months age group 7 (17.5), 3 and 5 cases found in less than 12 months and 49-60 months age group respectively.

**Table 1: Distribution of undescended testes cases according to age.**

S. no.	Age in months	Undescended testes	Percentage
1	Less than 12	3	7.5
2	12-24	6	15
3	25-36	7	17.5
4	37-48	8	20
5	49-60	5	12.5
6	Above 60	11	27.5

Table 2 shows distribution of undescended testes according to palpable or non-palpable testes. Majority of cases presented with palpable testes eg. 30 (75%) and 10 (25%) non-palpable testes.

**Table 2: Distribution of undescended testes cases according to palpable or non-palpable.**

S. no.	Undescended testes	Frequency	Percentage
1	Palpable	30	75
2	Non-palpable	10	25
3	Total	40	100

Table 3 shows majority of cases presented with unilateral undescended testes eg. 35(87.5%) and bilateral undescended testes were 5(12.5%).

**Table 3: Distribution of undescended testes cases according to bilateral or unilateral.**

S. no.	Undescended testes	Frequency	Percentage
1	Unilateral	35	87.5
2	Bilateral	05	12.5
3	Total	40	100

Table 4 shows majority of testes location was inguinal canal eg. 17(42.5%) followed by supra scrotal region 11(27.5%) Abdominal location were 9(22.5%) and 3 cases with testes location was perineal region (7.5%).

**Table 4: Distribution of undescended testes cases according to location.**

S. no.	Testes location	Frequency	Percentage
1	Abdominal	9	22.5
2	Inguinal canal	17	42.5
3	Supra scrotal region	11	27.5
4	Perineal region	03	7.5
5	Total	40	100

Table 5 shows majority of cases presented with right site undescended testes eg. 23 (57.5%) and left site was found in 17 cases (42.5%).

**Table 5: Distribution of cases according to site of undescended testes.**

S. no.	Undescended testes	Frequency	Percentage
1	Right site	23	57.5
2	Left site	17	42.5
3	Total	40	100

**Table 6: Distribution of cases according to complications of orchidopexy.**

S. no.	Complications of orchidopexy	Frequency	Percentage
1	Excessive bleeding	5	12.5
2	Severe pain	7	17.5
3	Infection at the surgical incision site	3	7.5
4	Adverse reaction to anaesthesia	2	5
5	Total	17	100

Table 6 shows most common complication of orchidopexy was severe pain eg. 7 (17.5) followed by excessive bleeding eg. 5 (12.5%), 3 (7.5%) cases presented with infection at the surgical incision site and 2 (5%) cases found adverse reaction to anaesthesia.

**Table 7: Sensitivity and specificity of ultrasonography result in undescended testes.**

Ultrasonography result	Undescended testes		Total
	Present	Absent	
Positive	20	5	Positive
Negative	5	10	Negative
Total	25	15	40

Sensitivity=  $20/25 \times 100 = 80\%$ .

Sensitivity of ultrasonography in undescended testes was 80%.

Specificity=  $10/15 \times 100 = 66.66$

Specificity of ultrasonography in undescended testes was 66.66.

**Table 8: Sensitivity of diagnostic laparoscopy in undescended testes.**

Diagnostic laparoscopy	Undescended testes		Total
	Present	Absent	
Positive	40	00	40
Negative	00	40	40
Total	40	40	40

Sensitivity=  $40/40 \times 100 = 100\%$ .

Sensitivity of diagnostic laparoscopy in undescended testes was 100%.

## DISCUSSION

In this study majority of cases found in the age group of above 60 months eg. 11(27.5%). Followed by 37-48 months age group eg. 8 (20%), 25-36 months age group 7 (17.5%), 3 and 5 cases found in less than 12 months and 49-60 months age group respectively (Table 1). Majority of cases presented with palpable testes eg. 30 (75%) and 10 (25%) non-palpable testes (Table 2). Majority of cases presented with unilateral undescended testes eg. 35 (87.5%) and bilateral undescended testes were 5 (12.5%) (Table 3). Majority of cases presented with right site undescended testes eg. 23 (57.5%) and left site was found in 17 cases (42.5%) (Table 5).

Similar result found in Mehmet Burak, Cildag found that the total of 32 patients with 34 testes (30 palpable, 4 non-palpable) were included in the study.<sup>13</sup> Two patients had bilateral and the others unilateral UDT. None of these testes were retractile. The mean age of the patients with UDT was 32.65 months (range 7-60 months). In unilateral

cases the right side [n=16 (53%)] was the most affected side compared with the left side [n=14 (47%)].

Bae et al found that the patient age ranged from 11 months to 144 months (mean age: 23 months).<sup>14</sup> Among the 21 unilateral cases, testicular absence or atrophy was confirmed in seven patients with a scrotal nubbin in six, and blind-ending vas and vessels at the external inguinal ring in one patient. Among the remaining 14 patients with sizeable testes, 12 testes were intra - abdominal. In this study majority of testes location was Inguinal canal eg. 17(42.5%) followed by supra scrotal region 11(27.5%) Abdominal location were 9(22.5%) and 3 cases with testes location was perineal region (7.5%) (Table 4).

Ismail et al revealed that the 20 low intra-abdominal testes (26.6%), 17 testes were high intra-abdominal (22.7%), and 18 testes (24%) entered the inguinal canal.<sup>15</sup>

In this study sensitivity of ultrasonography in undescended testes was 80% and specificity of ultrasonography in undescended testes was 66.66 (Table 7). Sensitivity of diagnostic laparoscopy in undescended testes was 100% (Table 8).

Similar study conducted by Tasian et al found that the ultrasound was the most heavily utilized imaging modality to evaluate undescended testes. Ultrasound has variable ability to detect palpable testes and has an estimated sensitivity and specificity of 45% and 78%, respectively, to accurately localize non-palpable testes.<sup>16</sup>

Limitation of the study was ultrasound is the most easily available diagnostic modality and is usually first choice of investigation. If there is bilateral undescended testis or abdominal testis, MRI is more useful than ultrasound. But study indicates that laparoscopy has proven to be only diagnostic modality and diagnostic imaging has no role in routine evaluation. Laparoscopy evaluation is not easily available in many centres.

## CONCLUSION

Diagnostic imaging has no role in the routine evaluation of boys with undescended testes.

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