

# Proportion of Testicular Absence and Position of Testis in Unilateral Nonpalpable Undescended Testis in a Tertiary Teaching Hospital in South India

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## ABSTRACT

**Introduction:** Undescended testis is a common surgical problem in children which needs to be treated by one and a half year of age. When testis is non palpable, it could be either absent, and when present intra-abdominal or inguinal.

**Methodology:** A hospital based retrospective study was conducted in department of paediatric surgery, Thiruvananthapuram. Study population consisted of children treated with nonpalpable undescended testis from January 2016 to June 2021.

**Results:** Mean age of intervention was 43.7 months (range 7 to 153 months). Incidence of absent testis was 30.97%. in 156 children who had ipsilateral undescended testis, 92 had intra-abdominal testis and 43 had inguinal testis. Presence of nubbin of testis in ipsilateral scrotum and contralateral testicular hypertrophy were suggestive of absent ipsilateral testis ( $p < 0.001$ ). Testis is absent in 11.3% only when ipsilateral hemi scrotum is under developed.

**Conclusion:** Proportion of absent testis is 30.97% in children with unilateral undescended testis. Presence of nubbin of testis in ipsilateral scrotum and contralateral testicular hypertrophy are predictive of ipsilateral testicular absence.

**Key Words:** Undescended testis, atrophic testis, Contralateral hypertrophy

## INTRODUCTION

Cryptorchidism or an undescended testis (UDT) is one of the common genital anomaly in boys. The definition of

cryptorchidism is that a testicle is not within the scrotum and cannot be manipulated into the scrotum. The incidence of cryptorchidism is approximately 2% (0.7–2.8%) in new-borns, and 1% in 1-year-olds; 80% of these undescended testes are clinically palpable and 20% of them are nonpalpable [1-3]

Children presenting with unilateral nonpalpable undescended testis may be having anorchia (absent testis)/atrophic testis or, intra-abdominal testis or inguinal testis. Standard treatment for non-palpable testis is laparoscopy which helps to identify the presence/ absence of testis and its position when present. The children with undescended testis - nonpalpable [UDT(NP)], 23% children have intraabdominal testis while in 60 – 64% testis is absent [2,3]. In rest of children testis is in inguinal canal. Nubbin in scrotum and contralateral testicular hypertrophy is said to be a marker of ipsilateral absence of testis. Operative findings suggestive of absent testis are blind ending vessels and a closed deep ring or nubbin of tissue at the tip of vas & vessels (atrophic testis)

Timing of surgical correction in children with undescended testis is 6 months to 12 months of age [4-8]. Many of our children are presenting late and hence undergo treatment much later which may affect the outcome. In the present study an

attempt is made to find the proportion of ipsilateral testicular absence and position of testis in children presenting with unilateral nonpalpable undescended testis in a tertiary care teaching hospital in South India.

## MATERIALS AND METHODS

This is a retrospective observational study conducted in department of paediatric surgery, SAT Hospital, Government Medical college, Thiruvananthapuram. Records of children who underwent treatment for nonpalpable unilateral undescended testis from January 2016 to June 2021 were retrieved and data collected. Those with bilateral undescended testis were excluded from the study.

All children with nonpalpable testis underwent laparoscopy as standard treatment. Laparoscopy was used to ascertain position of testis and to treat intra-abdominal testis. Absent testis/ vanishing testis was diagnosed by blind ending vas and vessels at or proximal to deep ring. Presence of hernia along with vas and vessel entering inguinal canal suggest inguinal testis and inguinal exploration was done. Closed ring with vas and vessels entering the deep ring suggest testicular atrophy/ vanishing testis and was confirmed by inguinal exploration. The testis identified in intra-abdominal position was treated with single stage or two stage orchiopexy depending on length of vessel as suggested by mobility and position of testis. The position testis was classified as intra-abdominal, at deep inguinal ring, peeping testis (testis inside inguinal canal which enter abdominal cavity intermittently) and inguinal testis

The following data were retrieved from the records – age of presentation, clinical findings (presence of nubbin, development of scrotum), findings in laparoscopy (presence/ absence of testis, position of testis if present and any associated anomalies. These data were entered in Microsoft excel sheet. Analysis was done using open-source statistical software ‘jamovi 2’ [9,10].

## RESULTS

During the study period from January 2016 to June 2021, 267 children underwent treatment for nonpalpable undescended testis, 41 were bilateral and were excluded from the study. Data of 226 children were collected and analysed.

Age of intervention varied from 7 months to 153 months (12yr 9 months) with a mean age of 43.7 months and median age of 29 months. Of 226, 136 (60.18%) had left sided undescended testis and 90 (39.82%) right sided.

The pattern of age at intervention/ presentation is given below

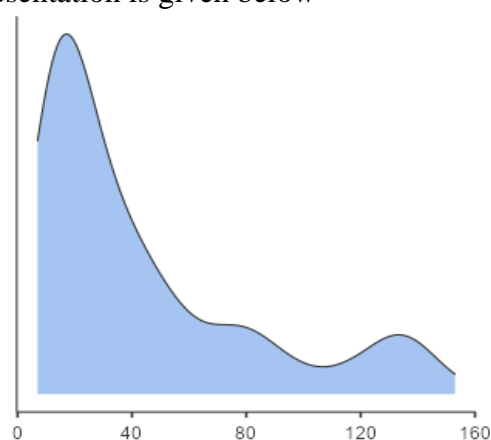


Figure 1. Age distribution, X axis age in months

Analysis of clinical findings showed underdeveloped scrotum in 91 (40.3%), nubbin of tissue present in 19 (8.4%) and 207 (91.6%) had empty scrotum. 53 (23.6%) children had hypertrophy of contralateral testis.

Following table show the associated anomalies seen in these children. 23 children had associated anomalies. Commonest anomaly identified was contralateral inguinal hernia in 13 (5.75%) children followed by hypospadias in 4 (1.77%).

Table 1 Associated anomalies in Unilateral nonpalpable undescended testis

|                                |    |       |
|--------------------------------|----|-------|
| Anorectal malformation         | 1  | 0.4%  |
| Hirschsprung's disease         | 1  | 0.44% |
| Hypospadias                    | 4  | 1.77% |
| Crossed fused ectopia - kidney | 1  | 0.44% |
| Renal Agenesis- Ipsilateral    | 1  | 0.44% |
| Inguinal Hernia- contralateral | 13 | 5.75% |
| Posterior urethral Valve       | 1  | 0.44% |
| Trisomy 21                     | 2  | 0.88% |
| Wilms Tumour                   | 2  | 0.88% |

Of the 226 children, 156 (69.03%) had testis in inguinal region or inside abdomen, in rest 70 (30.97%) children the ipsilateral testis was absent- either atrophic or vanishing testis. In 70 children with absent ipsilateral testis, 44 had vanishing testis (blind ending vas & vessels) and 26 had atrophic testis. In 44 children with vanishing testis, 16 had blind ending vas at or proximal to deep inguinal ring.

156 children who had the ipsilateral undescended testis present had distribution of testicular position as shown in the table 2.

**Table 2. Position of testis in those who had ipsilateral testis**

| Position of testis | Count | Proportion |
|--------------------|-------|------------|
| Ant ab wall        | 1     | 0.00641    |
| Deep Ring          | 13    | 0.08333    |
| Inguinal           | 43    | 0.27564    |
| Intra ab           | 92    | 0.58974    |
| Peeping            | 7     | 0.04487    |

The commonest position of testis was intra-abdominal, 92 (59.4%), of these 52 were within an inch from deep inguinal ring and 40 were more than 1 inch proximal to deep inguinal ring.

The relation between presence of nubbin of tissue in scrotum to absence of ipsilateral testis is shown in Table 3. In those having empty hemi scrotum 156 (75.36%) had ipsilateral testis, while none of those having nubbin of tissue in scrotum had testis on that side. The results were statistically significant ( $p < 0.001$ ).

**Table 3 Relation of ipsilateral testicular absence and presence of nubbin of tissue in scrotum**

|                    | Absent | Present | Total |
|--------------------|--------|---------|-------|
| Empty hemi-scrotum | 51     | 156     | 207   |
| Nubbin in scrotum  | 19     | 0       | 19    |
| Total              | 70     | 156     | 226   |

Similarly, the relation between presence of hypertrophy of contralateral testis to absence of ipsilateral testis shown in Table 4. All children with contralateral testicular hypertrophy had absent ipsilateral testis while 156 (90.17%) of those who didn't have contralateral testicular hypertrophy had ipsilateral testis in abdomen or inguinal canal. The results were statistically significant ( $p < 0.001$ )

**Table 4 Relation of contralateral testicular hypertrophy and ipsilateral testicular absence**

|                            | Contralateral testicular hypertrophy |         | Total |
|----------------------------|--------------------------------------|---------|-------|
|                            | Absent                               | Present |       |
| Absent ipsilateral testis  | 17                                   | 53      | 70    |
| Present ipsilateral testis | 156                                  | 0       | 156   |
| Total                      | 173                                  | 53      | 226   |

Relation between development of ipsilateral hemi-scrotum to presence or absence of ipsilateral testis was also analysed and shown in table 5. In 135 with normally developed hemi-scrotum, 62(45.93%) had ipsilateral absent testis while 73 (54.07%) had presence of ipsilateral testis while 83 (91.21%) out of 91 with underdeveloped scrotum had testis in inguinal or intra-abdominal position. This finding was also statistically significant ( $p < 0.001$ )

**Table 5 Relation of ipsilateral hemi-scrotal development and presence of ipsilateral testis**

|                            | Development of Hemi-scrotum |                | Total |
|----------------------------|-----------------------------|----------------|-------|
|                            | Normal                      | Underdeveloped |       |
| Ipsilateral testis Absent  | 62                          | 8              | 70    |
| Ipsilateral testis Present | 73                          | 83             | 156   |
| Total                      | 135                         | 91             | 226   |

## DISCUSSION

Undescended testis is a common urological anomaly with an incidence of around 1- 2% of male babies at 6 months of age. [11,12] Completion of treatment of undescended testis (by orchiopexy) is recommended within 18 months of age and laparoscopy is recommended for nonpalpable undescended testis. [13,14]

Age of treatment in this study ranged from 7 months to 153 months with a mean age of 43.7 months and median age of 29 months. It was higher than the recommended age, it is because of delayed presentation/ reference to our institution. Snodgrass W et al [2] reports a similar mean age of presentation (43.3 months). Zlatan Zvizdic et al [11] and Hori S et al [15] reports a mean age of 24 months. Bergbrant S et al [12] reports decrease in median age of treatment from 6.2 yrs in 2001 to 3.4 yrs in 2014. In our study 136 (60.18%) had left sided undescended testis and 90 (39.82%) right sided. Hori S et al [15] also reports a similar predominance on left side.

In this study the commonest associated anomaly is contralateral inguinal hernia (5.75%) followed by hypospadias (1.77%). Study by Hori S et al shows the incidence of 5% for inguinal hernia and 7% hypospadias. Incidence of hypospadias was lower in our study.

This study has 30.97% incidence of unilateral absent testis either vanishing testis or atrophic testis. Others report higher incidence of absent testis as follows, 41% reported by Kirsch AJ et al [16], 62.14% by Guiney E.J et al [17] and 51.85% by Gulanikar A et al. Ipsilateral testis was present 156 children in this study, of these 92 (58.97%) was intra-abdominal and 43 (27.56%) were inguinal in position. Kirsch AJ et al [16] report that 91 out of 266 testis present in their study was intra-abdominal, which is less than the proportion in our study.

When there was nubbin (possible atrophic testicular remnant) in ipsilateral scrotum ipsilateral testis was absent (19/19) while 156 out of 207 children with empty scrotum had ipsilateral testis. It was statistically significant also ( $p < 0.001$ ). Belman et al [18] also reports similar finding and they suggest diagnostic laparoscopy is not required if nubbin is found in scrotum. Presence of nubbin suggest ipsilateral absent testis.

Similarly, presence of contralateral testicular hypertrophy also had statistically significant relation with ipsilateral absence of testis. When contralateral hypertrophy of testis was present in 53 children with nonpalpable UDT, none of them had ipsilateral testis ( $p < 0.001$ ). Hurwitz RS et al [19] found that contralateral testicular hypertrophy of 18mm is predictive of absent ipsilateral testis with accuracy of 90 and Braga L.H et al [20] found 95% CI: 91–100%.

Another finding in our study is the relation between development of ipsilateral hemi-scrotum and presence or absence of ipsilateral testis, which was statistically significant ( $p < 0.001$ ). When the ipsilateral hemi-scrotum is poorly developed the

chance of ipsilateral testis being absent is low (11.43%). But we couldn't find any article to compare our results.

## CONCLUSION

Late presentation/ referral of undescended testis is still high with mean age of 43.7 months, even though the treatment should be ideally completed by 18 months of age. Proportion of absent testis is 30.97% in children with unilateral nonpalpable undescended testis. Presence of nubbin of testis in ipsilateral scrotum and contralateral testicular hypertrophy are predictive of ipsilateral testicular absence.

156 children had ipsilateral testis, among them 92 (58.97%) was intra-abdominal, 43 (27.56%) were inguinal in position, 13 at deep ring, 7 were peeping testis and one was found in anterior abdominal wall.

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