

## AGE AT ORCHIDOPEXY FOR UNDESCENDED TESTES: HOW FAR BEYOND ARE WE FROM GUIDELINES?

Tanvir Kabir Chowdhury<sup>1\*</sup> Md Khurshid Alam Sarwar<sup>2</sup> Rajib Khastagir<sup>2</sup> Md Minhajuddin Sajid<sup>2</sup>  
Tanzil Farhad<sup>3</sup> Ayesha Sadia<sup>3</sup> Md Abdullah Al Farooq<sup>2</sup>

### Abstract

**Background :** Recommendations for age at orchidopexy for Undescended Testis (UDT) have changed from time to time in accordance with change of knowledge regarding its pathology and prognostic features. In most developed countries, recommendation for ideal time of orchidopexy is between six months to one year. This study investigates the age of patients who underwent orchidopexy for undescended testis in this institute to assess the current trend of age at orchidopexy in this region.

**Materials and methods :** This is a retrospective study carried out in the Department of Pediatric Surgery, Chittagong Medical College Hospital from January 2017 to December 2019. Patients of UDT who visited the outpatient department, admitted in this ward or underwent orchidopexy in this department were retrospectively evaluated from hospital records, operating theatre register, patient files and admission profile and departmental audits. Number of patients, side of involvement and age distribution were calculated.

**Results:** A total of 218 patients of UDT attended OPD (1.91% of total OPD) 96 patients were admitted (1.33 % of all admissions) and 82 patients underwent orchidopexy (1.48 % of total surgeries) during the study period. Age at orchidopexy ranged from 8 months to 12 years with a median age of 5 year 11 months. Only 5 patients (6.10 %) underwent orchidopexy at the recommended time of between 6 months to one year.

**Conclusion:** Many patients attended OPD after the recommended age and many underwent surgery at a later age which increases their risk of malignancy and testicular atrophy.

1. Assistant Professor of Pediatric Surgery  
Chittagong Medical College, Chattogram.
2. Associate Professor of Pediatric Surgery  
Chittagong Medical College, Chattogram.
3. Student of MS  
Department of Pediatric Surgery  
Chittagong Medical College, Chattogram.

**\*Correspondence:** Dr. Tanvir Kabir Chowdhury  
E-mail: [ivan\\_tanvir@yahoo.com](mailto:ivan_tanvir@yahoo.com)  
Cell : 01771 47 77 66

Submitted on : 14.01.2020

Accepted on : 27.01.2020

### Key words

Undescended testis; Orchidopexy; Age; Infertility; Malignancy.

### Introduction

Undescended Testis (UDT) or Cryptorchidism is the most common congenital anomaly of the urogenital system and it affects 1-6% of males at birth<sup>1</sup>. The incidence in premature babies is 33%, in full term babies 3-5% and at one year it becomes near 1% due to spontaneous descend of some undescended testis<sup>2</sup>. Orchidopexy is the recommended treatment for UDT. However, the recommendations for the ideal age at surgery for UDT has changed time to time with the advancement of knowledge about its pathophysiology and potential harmful effects on the body. If left untreated it may lead to infertility and malignancy. Most consensus guidelines now recommend doing orchidopexy between 6 to 9 months or before one year of age<sup>3,4</sup>. In 1996, American Academy of Pediatrics recommended surgery at an age of 12 months, the "British Association of Paediatric Urologists" consensus meeting in 2011 and the Nordic consensus statement recommended the age of surgery between 6-12 months<sup>1,4,5</sup>. A systematic review concluded that highest quality of evidence recommends orchidopexy between 6 and 12 months<sup>6</sup>. Recently there has been further suggestion that orchidopexy at an age of 3 months has further benefits<sup>7</sup>. However, several hospital based studies have shown that a considerable number of orchidopexies are being done beyond the recommended age<sup>8</sup>. The aim of the study was to assess the current trends of age at doing surgery for UDT in our institute and to assess how far beyond we are from guidelines.

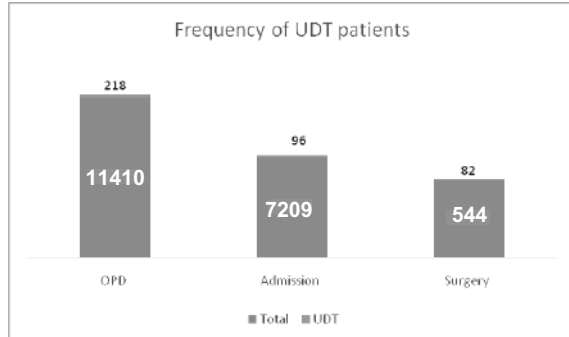
### Material and methods

A retrospective study was carried out in the Department of Pediatric Surgery, Chittagong Medical College Hospital (CMCH) over a period January 2017 to December 2019 (Total 3 years). 88 Patients of UDT who visited the outpatient Department, admitted in this ward or underwent orchidopexy in the Department of Pediatric Surgery,

CMCH were evaluated. Within the study period in a total of 218 patients of UDT attended the OPD, 96 got admitted and 82 underwent orchidopexy. Hospital records of patients who underwent orchidopexy for UDT were evaluated retrospectively. Yearly departmental audits, admission registry and operating theatre registry from 2017 to 2019 were checked for diagnosis of UDT, side of involvement and age at repair. Data were evaluated to see the yearly percentage of patient bulk, age at repair, laterality and type of surgical intervention. Data were analyzed in Microsoft excel 2019 and SPSS version 23. Frequency, age, side of involvement was analyzed using student t test.

**Results**

During the study period a total of 96 boys were admitted with the diagnosis of UDT which is 1.33% of total patients admitted in this department and 2% of male admissions. In outpatient department, 218 patients attended for consultation which is 1.91% of all OPD and 2.81% of male OPD consultations. A total of 82 boys underwent surgery for UDT which was 1.48% of all surgeries performed during that period. Figure 1 shows the relative frequency and Table-I shows laterality of UDT among OPD, admissions and surgeries.

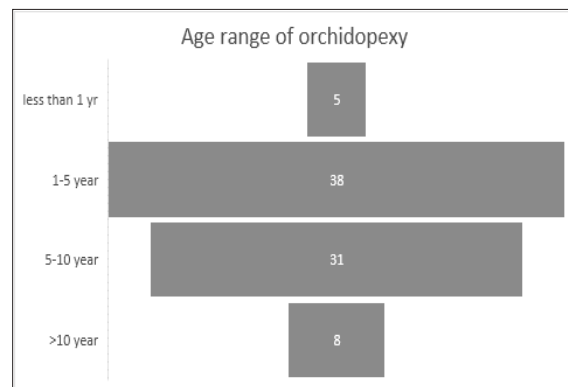


**Fig 1 :** Frequency of UDT patients among OPD, admissions and surgeries.

**Table I :** Laterality of UDT among OPD, admissions and surgeries.

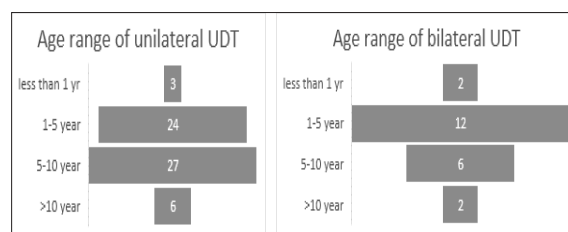
Laterality	Total	Percentage
<b>UDT OPD</b>		
Left	91	41.74%
Right	91	41.74%
Bilateral	36	16.51%
<b>UDT admission</b>		
Left	35	36.46%
Right	36	37.50%
Bilateral	25	26.04%
<b>Orchidopexy</b>		
Left	31	37.80%
Right	33	40.24%
Bilateral	18	21.95%

Mean age of orchidopexy was 5 year 11 months (Range 8 months to 12 years). Among patients with unilateral orchidopexy, mean age was 6 year 2 months (Range 8 months to 12 years) and it was 5 years 1 month (Range 8 months to 12 years) in patients with bilateral UDT. There was no statistically significant difference between mean age of unilateral and bilateral UDT (p value 0.21). Among all orchidopexies done, 38 (46.34%) patients were between 1-5 year age range. Only 5 (6.1%) patients underwent orchidopexy within the recommended age for surgery (Before 1 year). However, only 8 (9.76%) patients underwent orchidopexy after 10 years which age group has the highest malignant potential. Figure 2 shows age range of patients who underwent orchidopexy.



**Fig 2 :** Age range of all patients who underwent orchidopexy.

More than half of the patients (12 of 22 patients, 54.55%) with bilateral UDT underwent orchidopexy between 1 to 5 years of age. On the other hand, majority (27 of 60 patients, 45%) of unilateral UDT underwent surgery between 5 to 10 years of age. Figure 3 shows distribution of age range between unilateral and bilateral UDT.



**Fig 3 :** Distribution of age range between unilateral and bilateral UDT.

## Discussion

The frequency of UDT in this region is consistent with frequencies described in the literature. Among patients underwent orchidopexy, right UDT was more common which is also consistent with other studies but the difference between right and left side (40.24% vs 32.39%) is less than that described in the literature (50% vs 30%)<sup>9,10</sup>. However, the frequency of right and left UDT were almost similar among patients consulting OPD (Both 41.74%) and got admitted (37.50% vs 36.46%). Among the patients of unilateral UDT who attended the OPD, only 39.01% patients got admitted and 32.97% underwent surgery. On the other hand, among patients with bilateral UDT who attended the OPD 69.44% got admitted and 61.11% underwent surgery. This may suggest that parents were more concerned when the defect was bilateral and more reluctant to do surgery if it was unilateral.

Orchidopexy should not be performed very early, as there is chance of spontaneous descend of testes during the first 3 months of life. However, if it does not descend by 6 months it is very unlikely that it will descend at all<sup>6</sup>. However, the age at orchidopexy remains at higher age than recommendation around the world. Median ages of orchidopexy were 16.6 months and 31.1 months respectively in studies from New South Wales (Australia) and New Zealand. In Victoria, Australia up to 55% of boys had their surgery after the age of five, well beyond the presumed optimal age<sup>1</sup>. Median age of orchidopexy in a study from USA was 28.9 months, Saudi Arabia, 46.7 months, Taiwan 44.7 months and in India 3.9 years<sup>8,11-13</sup>. In a study from Germany 78% of the orchidopexies were done beyond recommended age of surgery and only 28.5% of surgeries in UK were performed within 2 years<sup>14,15</sup>. Bajaj and Upadhyay compared mean age at orchidopexy between 1996-98 and 2014-2016 and found that there was a drop of median age both for referral (23 months vs 5.3 months) and orchidopexy (38.8 months vs 12.6 months) in the latter group<sup>1</sup>. In a study from BIRDEM, Dhaka, Bangladesh the median age of orchidopexy was 4 years<sup>16</sup>. In this study mean age of orchidopexy was 5.89 years which is well beyond the recommended age and only 5 (6%) patients underwent orchidopexy in recommended age range.

The causes of delay in orchidopexy are attributed to delayed referral, fear of surgery, absence of good anesthetic setup, lack of knowledge, social stigma, absence of updated knowledge, lack of genital examination during baby check-ups, failure of screening, lack of continuing medical education, prolonged waiting time for surgery<sup>1,17</sup>. A particular problem was multiple changes of guideline over a relatively short period of time. A nationwide population-based study in Taiwan investigated the factors related to the time of orchidopexy and found that about 79.2% of the 547 boys received surgery after the age of 12 months. Factors that were significantly associated with the time of surgery in a multivariate analysis were age of the physician making the diagnosis, age of the surgeon performing the surgery, age of the patient at the first diagnosis of UDT and number of previous clinic visits with the diagnosis of UDT and urbanization level of the patients' residence<sup>8</sup>. An earlier study using nation wise data base in the USA showed that 43% of patients had surgery by 2 years of age and factors associated with timing of surgery were patient race, insurance status and the related hospital<sup>17</sup>. An Indian Study by Sinha et al indicated that delayed diagnosis and delay in referral is a major problem<sup>2</sup>.

Recent advocacy for early orchidopexy has several reasons. A systematic review found that surgery between 6 to 12 months may optimize fertility potential and protect against testicular malignancy<sup>6</sup>. A RCT showed that boys who underwent orchidopexy at 9 months of age had significant catch-up growth of the repaired testis but those who underwent orchidopexy at 3 years had no testicular growth<sup>18</sup>. Germ cell count and mean tubular fertilization rate (Percentage of tubules containing at least one germ cell) were significantly higher in boys with UDT aging less than 1 year vs other age groups<sup>19</sup>. Studies in adult showed that sperm count and highly motile spermatozoa were significantly increased when orchidopexy was performed before 1 year compared to 1–2 years of age<sup>20</sup>. A Swedish study published in the New England Journal of Medicine showed that hazard ratio for testicular cancer increases with delay in age at orchidopexy<sup>21</sup>. A meta-analysis showed that patients who underwent orchidopexy after 10–11 years were 2.9–32.0 times more likely to develop testicular cancer than those who underwent earlier correction<sup>22</sup>. Furthermore, a very recent

study from France also showed that surgery before the age of one year does not lead to a superior risk of testicular atrophy compared with surgery at an older age and allows a good testicular development<sup>23</sup>.

A 22-year retrospective study from China found that the recommended orchidopexy age was not achieved and recognized national need to address this. Their suggested approach was to understanding of UDT among general population and earlier primary care referral from routine post-natal baby check to a specialist center that can perform surgery in this age group<sup>5</sup>.

#### Limitations

This study has its own limitation of being a retrospective one. Data from single government hospital might not reflect all portion of the society as because patients with relatively lower socioeconomic conditions represent more in the government hospital and the scenario from private hospitals might be different. Moreover, the cause of delay could not be evaluated from this study since it was not recorded.

#### Conclusion

Most orchidopexies are not done within the recommended age of 6 to 12 months. Patients with bilateral UDT are having orchidopexies at a relatively earlier age than with unilateral UDT but their difference is not statistically significant.

#### Recommendation

Further studies might be done to find out the causes of delay and steps should be taken for treatment of UDT at an appropriate age to reduce the risk of cancer and infertility.

#### Acknowledgement

We are grateful to all postgraduate students, ward and operating theatre staffs of Department of Pediatric Surgery to help us with finding and sorting of patient files and records.

#### Contribution of authors

TKC-Conception, data collection, manuscript writing & final approval.

MKAS- Manuscript writing, data analysis & final approval.

RK- Interpretation data, manuscript writing & final approval.

MMS-Data collection, manuscript writing & final approval.

TF- Data collection, manuscript writing & final approval.

AS- Data collection, manuscript writing & final approval.

MAAF-Interpretation of data, critical revision of content & final approval.

#### Disclosure

All authors declared no conflict of interest.

#### References

1. M. Bajaj and V. Upadhyay. "Age at referral for undescended testes: Has anything changed in a decade?," *N. Z. Med. J.* 2017;130(1457):45-49.
2. C. K. Sinha, S. Vinay, R. Kulkarni, and S. Nour, "Delayed diagnosis for undescended testes," *Indian Pediatr.* 2008;45(6):503-504.
3. W. Y. Huang et al. "Epidemiology of hypospadias and treatment trends in Taiwan: A nationwide study," *J. Urol.* 2011;185(4):1449-1454.
4. E. Martin Ritzén. "Undescended testes: A consensus on management," *Eur. J. Endocrinol.* 2008;159(supp(-1)):87-90.
5. Y. Wei et al. "A 22-year retrospective study: Educational update and new referral pattern of age at orchidopexy.," *BJU Int.* 2016;118(6):987-993.
6. E. Chan, C. Wayne and A. Nasr. "Ideal timing of orchiopexy: A systematic review.," *Pediatr. Surg. Int.* 2014;30(1):87-97.
7. J. M. Hutson, A. Balic, T. Nation, and B. Southwell, "Cryptorchidism." 2010;215-224.
8. Y.-F. Chen, W.-Y. Huang, K.-H. Huang, J.-T. Hsieh, C.-F. Lan and H.-C. Chang, "Factors related to the time to cryptorchidism surgery: A nationwide, population-based study in Taiwan.," *J. Formos. Med. Assoc.* 2014;113(12):915-920.
9. S. L. Lee JJ. "Undescended testes and testicular tumors," in *Ashcraft's Pediatric Surgery*, 6th ed., O. D. Holcomb GW, Murphy JP. Ed. . Saunders - Elsevier, Philadelphia. 2017;689.
10. P. R. Donahoe PK, Schnitzer JJ. "Ambiguous genitalia," in *Pediatric surgery*. F. E. W Grosfeld J L, O'neil J A. et al. Ed. Mosby-Elsevier, Philadelphia. 2006;1911-32.
11. A. P. Bayne, D. G. Alonzo, M. H. Hsieh, and D. R. Roth, "Impact of anatomical and socioeconomic factors on timing of urological consultation for boys with cryptorchidism.," *J. Urol.* 2011; 186(4):1601-1605.

12. H. Alhazmi et al. "Timing of orchidopexy at a tertiary center in Saudi Arabia: Reasons for late surgery.," *J. Urol.* 2018;38(4):284-287.
13. R. Kumar, K. C. Mandal, P. Halder, M. Hadiuzzaman, M. Mukhopadhyay and B. Mukhopadhyay. "Laparoscopy in the evaluation of impalpable testes and its short-term outcomes: A 7 years' experience," *J. Indian Assoc. Pediatr. Surg.* 2017;22(4):232-236.
14. K. O. Hensel, T. Caspers, A. C. Jenke, E. Schuler, and S. Wirth. "Operative management of cryptorchidism: Guidelines and reality : A 10-year observational analysis of 3587 cases.," *BMC Pediatr.* 2015;15:116.
15. J. E. McCabe and S. E. Kenny. "Orchidopexy for undescended testis in England: Is it evidence based?," *J. Pediatr. Surg.* 2008;43(2):353-357.
16. P. Mmm, E. Sms, T. Narmeen, M. Nooruzzman, M. Shahnaz and C. Atmm. "Original Article Short Term Outcome of Orchiopexy for Undescended Testis in Children." 2017;29(1):35-38.
17. P. J. Kokorowski, J. C. Routh, D. A. Graham and C. P. Nelson. "Variations in timing of surgery among boys who underwent orchidopexy for cryptorchidism," *Pediatrics.* 2010;126(3).
18. C. Kollin, B. Karpe, U. Hesser, T. Granholm and E. M. Ritzén. "Surgical Treatment of Unilaterally Undescended Testes: Testicular Growth After Randomization to Orchiopexy at Age 9 Months or 3 Years," *J. Urol.* 2007;178(4):1589-1593.
19. K. H. Park, J. H. Lee, J. J. Han, S. D. Lee, and S. Y. Song. "Histological evidences suggest recommending orchiopexy within the first year of life for children with unilateral inguinal cryptorchid testis." 2007;14(7):616-621.
20. F. Canavese et al. "Sperm count of young men surgically treated for cryptorchidism in the first and second year of life: Fertility is better in children treated at a younger age." *Eur. J. Pediatr. Surg.* 2009;19(6):388-391.
21. A. Pettersson, L. Richiardi, A. Nordenskjold, M. Kaijser and O. Akre. "Age at surgery for undescended testis and risk of testicular cancer." *J. Urol.* 2008;179(2):547.
22. T. J. Walsh, M. A. Dall'Era, M. S. Croughan, P. R. Carroll and P. J. Turek. "Prepubertal Orchiopexy for Cryptorchidism May be Associated With Lower Risk of Testicular Cancer." *J. Urol.* 2007;178(4):1440-1446.
23. J. B. Marret et al. "Surgery for no palpable testis before the age of one year: A risk for the testis?." *J. Pediatr. Urol.* 2019;377.e1-377.e6.