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Case series: Epidemiology of cryptorchidism at our rural setup

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Abstract

Objective: Cryptorchidism or undescended testes is a common birth condition in children and infants. Numerous complications can arise if untreated, but can be prevented by timely intervention. This prospective study is done to determine the epidemiological parameters of undescended testes in rural population of North Maharashtra.

Methodology: This case series included 89 patients presenting to our OPD at ACPM Medical College, Dhule, From June 2014 to March 2016. Variables studied were the age of presentation, the population distribution, position of testes, size of testes and surgical outcomes.

Results: Among 89 patients, over all incidence of cryptorchidism in boys in our study was found to be around 0.7% (total pediatric OPD cases were 12,714). This rate was slightly lower to similar studies conducted elsewhere. No definite etiology could be found but there are some persistent factors like socio economic status. Higher rate of cyptorchidism was noted in lower socioeconomic class. About 20.22% patients were preterm suggesting higher preponderance with prematurity. 10.1% patients had a positive family history indicating a possible role in etiology. Maximum frequency of presentation was in 0 to 2 years age group followed by 3 to 5 years age group. But about 13.48% patients presented as late as 11 to 13 years thereby having a higher risk of testicular atrophy. Diagnostic investigation in all patients was abdominal ultrasound. All the testes impalpable on examination could be located with ultrasound in various regions of abdomen and pelvis, thereby aiding advanced planning of intervention required. Two staged orchidopexy can give good results but should be reserved for high lying testies, especially abdominal, for rest, a single stage orchidopexy can give satisfactory results.

Conclusion: Undescended testes is a common birth problem among paediatric population and surgical approach has shown to have good results.

Keywords: Epidemiology, cryptorchidism, rural setup

Introduction

The word cryptorchidism is derived from Greek word 'cryptos' meaning hidden and orchis meaning testes i.e. absence of one or both testes from the scrotum. Cryptorchid testes is defined as failure of descent of one or both testes amidst the normal pathway^[1]. Failure of descent can occur at any level in the normal pathway.

Cryptorchidism is most common birth defect of genitalia in boys^[2]. Despite its frequency there are many controversies regarding many aspects including its etiology, natural history, mode and timing of treatment as well as complications. Failure of testes to descent can be a result of multifactorial causes like: hormonal, genetical congenital syndromes, permanently, low birth weight, environmental and maternal factors, familiar (siblings).

Numerous complications can result when testes don't lie in the scrotum. These complications can be prevented by timely intervention^[1]. The proper timing of surgery has long been debated. In the seventies the American Academy of Pediatrics recommended that genital surgery should be done at the age of four for psychological reasons. During the last decades, based on indirect proof, there has been a shift towards earlier treatment leading to a general consensus that treatment should be given before the age of one year.

Hence our study aims at delineating various factors that can be taken care of in gestational and neonatal period that may aid timely diagnosis in suspect population, if not absolute prevention.

Aims and Objectives

1. To find out the incidence of cryptorchidism in rural population
2. To find the etiology of cryptorchidism.
3. To interpret the age at presentation.
4. Investigation and management of cryptorchidism.

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Material and methods

Study was conducted over 89 patients of cryptorchidism at rural setup in our institute from June 2014 to March 2016. It is a prospective study. All patients in our OPD with genitourinary complaints were examined and cases with cryptorchidism were included in our study. All cases of cryptorchidism were subjected to diagnostic investigations and surgery, and followed up accordingly.

Inclusion Criteria

1. All cases of cryptorchidism at 0-20 yrs of age at presentation.
2. Associated urogenital anomalies.

Exclusion Criteria

1. No other associated congenital anomalies.
2. Patients with intersex conditions

The study protocol was reviewed by institutional ethical committee and permitted by it. The relevant data was obtained from patients and their parents accordingly, by using pretested proforma. All patients included in the study were evaluated on the basis of history, clinical examination, routine investigations, ultrasound of abdomen and pelvis for detection of: 1) Position of undescended testes, 2) Parenchymal changes, 3) Vascularity of gonadal vessels. Patients diagnosed with undescended testes underwent appropriate operative procedure (staged/ unstaged orchidopexy) and were followed up.

Observation and results

A total of 89 patients were admitted and treated at our institute. Hospital with the diagnosis of undescended testes.

- The incidence of cryptorchidism in boys coming to our OPD was 0.7% (total male patients in paediatric OPD were 12,714).
- All patients were residents of different regions in North Maharashtra [Table1].

Table 1: Distribution of study group according to residence

| Region | Frequency | Percentage |
|-----------|-----------|------------|
| Dhule | 52 | 58.4% |
| Jalgaon | 23 | 25.8% |
| Malegaon | 06 | 6.7% |
| Nandurbar | 02 | 2.24% |
| Sakri | 06 | 6.7% |
| Total | 89 | 100% |

- The age of patients at presentation range from 3 month - 12 years. 48.31% patients presented below the age of 2 years, 23.59% patients presented between 3 - 5 years of age and 14.6% patients presented beyond 6 - 10 years. 13.48% of patients presented between 11 - 13 years [Table 2].

Table 2: Distribution of study group according to age

| Age (in years) | Frequency | Percentage |
|----------------|-----------|------------|
| 0 - 2 | 43 | 48.31% |
| 3 - 5 | 21 | 23.59% |
| 6 - 10 | 13 | 14.6% |
| 11 - 13 | 12 | 13.48% |

- Positive family history of undescended testes was present in 10.1% patients.
- 80.88% patients were full term at delivery whereas 20.22% were preterm.
- In 91% of UDT were discovered by parents (mother).

- 69.7% of parents were educated, 30.3% non-educated in health education and child care.
- As far as socioeconomic status of the patients was concerned 66.29% of patients were from lower class and 33.71% were from middle class. We had no patients from higher class [Table 3].

Table 3: Distribution of study group according to socioeconomic status

| Socioeconomic status | Number of patients | Percentage |
|----------------------|--------------------|------------|
| Lower Class | 60 | 66.29% |
| Middle Class | 29 | 33.71% |
| High Class | 0 | 0% |

Presenting findings: All patients presented with empty scrotum. 83.1% presented with developed scrotum and 16.9% patients with underdeveloped scrotum [Table 4].

Table 4: Status of development of scrotum

| Status | Frequency | Percentage |
|----------------------|-----------|------------|
| Developed (D) | 74 | 83.1% |
| Under developed (UD) | 15 | 16.9% |
| Total | 89 | 100% |

In 77.5% patients the testes were palpable on examination in inguinal region, 22.5% patients the testes were impalpable. Out of the patients who had palpable testes 46.06% had testes in inguinal canal, 22.5% at root of scrotum, 8.89% at the internal ring, 4.49% of testes were palpated in superficial inguinal pouch (ectopic) [Table 5]. 40.4% patients were left sided, 36% patients had right sided, while 23.6% patients had bilateral palpable testes.

Table 5: Position of Testis on Examination

| Position of palpable testes | Frequency | Percentage |
|-----------------------------|-----------|------------|
| Inguinal Canal | 41 | 46.06% |
| Root of Scrotum | 20 | 22.5% |
| Internal Ring | 8 | 8.98% |
| Superficial Inguinal Pouch | 4 | 4.49% |
| Nonpalpable | 16 | 17.97% |
| Total | 89 | 100% |

Normal size of testes in relation to age, compared with normally descended testes was noted in 71.9%. Small size, compared with normal descended testes in 8.98%, whereas moderate in 16.84% and 2.24% were found to be atrophied and removed [Table 6.1 and 6.2].

Table 6.1: Distribution of study group according to the size of testes (n=89)

| Age (in years) | Normal | Moderate | Small | Atrophy | Total |
|----------------|-------------|-------------|-----------|-----------|-------------|
| 0 - 2 | 42 (47.19%) | 0 (0.0%) | 1 (1.12%) | 0 (0.0%) | 43 (48.3%) |
| 3 - 5 | 17 (19.1%) | 3 (3.37%) | 1 (1.12%) | 0 (0.0%) | 21 (23.39%) |
| 6 - 10 | 3 (3.37%) | 7 (7.86%) | 3 (3.37%) | 0 (0.0%) | 13 (14.6%) |
| 11 - 13 | 2 (2.24%) | 5 (5.61%) | 3 (3.37%) | 2 (2.24%) | 12 (13.48%) |
| Total | 64 (71.9%) | 15 (16.84%) | 8 (8.98%) | 2 (2.24%) | 89 (100%) |

Table 6.2: Reference values of normal testicular volume according to age group

| Age (in years) | Testicular Volume (in ml) |
|----------------|---------------------------|
| 0-2 | 1-3 |
| 3-5 | 4-6 |
| 6-10 | 8-10 |
| 11-13 | 14-16 |
| >14 | 18-25 |

Discussion

Cryptorchism is most common birth defect of genitalia in boys [2]. The incidence of cryptorchidism in full-term newborns, according to a study by Kolon FT *et al* has been quoted as high as 30% in premature boys and 1 to 3% in term boys [3]. In yet another study by Scorer GC, though the figure for preterms is high upto 21%, and fullterms is 2.7%, this falls to 0.8% by 1 year of age. Also, after 3 months of age, descent was rarely noticed [4]. In our study, we all cases were in the age group 3 months to 12 years. Of them 20.22% were preterm. We found out the incidence to be 0.7% of the total male pediatric OPD cases of 12,714.

Patients came from various parts of North Maharashtra were included in our study. Out of the total 89 cases, maximum were from Dhule (58.4%), followed by Jalgaon (25.8%), while least were from Nandurbar area (2.24%) [Table 1]. No significant correlation could be found between these geographical areas.

Many studies have implicated high incidence of positive paternal history in cases of cryptorchism. In his study Alberto Ferlin *et al* found (4.9%) 15 out of 303 patients who had cryptorchism had positive family history of cryptorchidism [5].

Elert A *et al* in his study found that almost 23% of patients with undescended testes had a family history of cryptorchidism, as against to 7.5% in control group. [6] The familial cluster is 3.6 fold overall, 6.9 if sibling is affected and 4.6 if father. We found out that our 10.1% patients had a positive family history.

Moller, H. *et al* found that there was a 3 fold higher risk of cryptorchidism between unskilled workers and self employed educated individuals. [7] We in our study found that a third of patients' parents were uneducated.

Scrotal development is known to be affected by testicular descend. All of our patients presented to us with an empty scrotum. Out of them most (83.1%) had a well developed scrotum in accordance of their age. However, 16.9% had a underdeveloped scrotum. In a study by Cisek LJ *et al* approximately 80% of undescended testes were found to be palpable and 20% were nonpalpable [8]. Our study echoed these findings, 77.5% cases had palpable testes and 22.5% had impalpable testes.

Cendron and Duckett documented the position upon physical examination [9]. On physical examination, testicular positions were as follows [Table 7].

Table 7: Comparison according to location of testes

| Anatomical site | Study by Cendron and Duckett | Our study |
|-------------------|------------------------------|-----------|
| Nonpalpable | 32.8% | 17.97% |
| Internal ring | 11.8% | 8.98% |
| Inguinal canal | 34.7% | 46.06% |
| Root of scrotum | 15.3% | 22.5% |
| Suspected ectopia | 5.4% | 4.49% |
| Total | 100% | 100% |

Minimum incidence of palpable testes in both of the studies was at internal ring. Also the maximum incidence of palpable testes was in inguinal canal. Our study figures regarding ectopic testes

were also comparable to this study.

Sinha CK *et al* in their study noted that of the 250 cases under study, 202 (80.8%) were unilateral right 110 (44%) and left 92 (36.8%) and 48 (19.2%) were bilateral. In our study 40.4% patients were left sided, 36% patients had right sided, while 23.6% patients had bilateral palpable testes. [10] Both studies results are comparable with unilateral undescended testes comprising 80% while bilateral being only 20%. [Table 8].

Table 8: Comparison between studies on type of undescended testes.

| Type of undescended testes | Study by Sinha CK <i>et al</i> | Our Study |
|--------------------------------|--------------------------------|-----------|
| Unilateral testis | 80.8% | 76.4% |
| Left sided undescended testis | 36.8% | 40.4% |
| Right sided undescended testis | 44% | 36% |
| Bilateral undescended testes | 19.2% | 23.6% |

Sinha CK *et al* in their study also found that only 24% cases presented before the age of 2 years. 33.6% cases presented from 2 years to 6 years of age group, whereas highest of them (about 42.4% cases) presented after 6 years of age [10]. Contrary to this maximum of our patients (48.31%) presented to us before 2 years of age. 23.59% patients presented between 3 – 5 years of age, 14.6% presented 6 to 10 years of age and 13.48% of patients presented as late as 11 – 13 years.

Conclusion

Over all incidence of cryptorchidism in boys in our study was found to be around 0.7% (total pediatric OPD cases were 12,714). This rate was slightly lower to similar studies conducted elsewhere. No definite etiology could be found but there are some persistent factors like socio economic status. Higher rate of cyptorchidism was noted in lower socioeconomic class. About 20.22% patients were preterm suggesting higher preponderance with prematurity. 10.1% patients had a positive family history indicating a possible role in etiology. Maximum frequency of presentation was in 0 to 2 years age group followed by 3 to 5 years age group. But about 13.48% patients presented as late as 11 to 13 years thereby having a higher risk of testicular atrophy.

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