

Clinical Profile and Management Options in Patients with Undescended Testis

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I. Introduction

Cryptorchidism is one of the conditions that surgeons, anatomists and pathologists have studied for over a hundred years. In spite of this, it has not been possible to evolve an ideal mode of treatment for this condition. However, work by several authors in the very recent past has thrown new light on several aspects of this anomaly which were previously unknown.

The abnormality assumes particular importance in cases of bilateral undescended testes, where correct diagnosis and timely treatment can save patient from life long misery of sterility. In unilateral cases treatment is directed to prevent complications known to be associated with undescended testis.

It is now known that even if timely hormonal or surgical treatment is instituted in patient with unilateral or bilateral cryptorchidism, it does not guarantee fertility. (Charney and Wolgin 1956, Campbell 1982). This is further complicated by the fact that variety of associated vasal and epididymal or even histological changes may be present on the ipsilateral or contralateral side. (Kogan 1982, Dean 1952)

For prognosis regarding fertility one should consider epididymal anomalies detected at orchiopexy. Such anomalies may coexist with excellent testicular histology, so that, fertility impairment may occur due to failure of sperm transport, despite the preservation of germ cells by early orchiopexy.

Even if orchiopexy is done the chances of malignancy are the same as in untreated, undescended testes. Diagnosis becomes easier if an orchiopexy is carried out.

Cancer of the undescended testis or maldescended testis is known to occur, if not timely treated."

In our series, we have studied cases of undescended testis. One of the basic clinical problems in undescended testis in, its correct diagnosis, as a highly retractile testis can often be mistaken for cryptorchidism. An ectopic testis may also be mistaken for an undescended testis. (Ajmer Singh, 1982)³ A true undescended testis is one, which is not in the scrotum, but some where along the normal route of embryological descent and which cannot be coaxed to touch the bottom of the scrotum.'

In our series we have compared the different surgical methods of orchiopexy, their results and their complications. We have studied incidence and different types of vaso-epididymal anomalies. Diagnosis of the exact site of an impalpable undescended testis may be confirmed by investigation such as Ultrasound, Peritoneoscopy, Venography, CT Scan or MRI. Since in our institution ultrasonography is easily accessible, we have studied its role in locating the impalpable testis.

This series of patients included only cases of true undescended testis and as such no selection process has been used in their management with different surgical procedure.

II. AIMS AND OBJECTIVES

- 1) Recognition of the condition.
- 2) To study proper diagnostic evaluation and timely intervention
- 3) To study frequency of arrest of descent of testis at various sites in normal course of descent.
- 4) To study surgical management in cases of undescended testis.
- 5) To Study the size of undescended testis compared to contralateral side.
- 6) To study association of vaso-epididymal anomalies and often congenital anomalies in cases of undescended testis.

III. Materials And Methods

Total number of cases 25

- 1) All the cases of undescended testis admitted and treated in Bharati Hospital Pune over the period of 2 years from august 2009 to august 2011 were studied.
- 2) All patients were admitted to the surgery ward and paediatric ward of Bharati hospital detailed clinical examination and necessary investigations including USG, Karyotyping as and when required and measurement of testis size were carried out and treated accordingly.

- 3) Intra operative measurement of size of undescended testis and normal testis. Post operative patients were followed up at 6 months, 1 year and 2 years respectively.

IV. Observations & Results

Table I Age Of Presentation

S.NO	Age of Presentation	No. of Patients
1	0-6months	3
2	6months - 2years	3
3	2years-5years	10
4	5years – 15years	7
5	>15years	2
	Total	25

Table II Mode of presentation

S.NO	Mode of Presentation	No. of Patients
1	Undescended Testis	23
2	Adult with Infertility	0
3	Obstructed hernia	1
4	With other congenital anomalies	1
	Total	25

Table III Presentation on Local Examination

S.NO	Presentation on Local Examination	No. of Patients
1	Palpable Testis	18
2	Impalpable Testis	07
	Total	25

Table IV Presentation site on local examination in case of palpable testis

S.NO		No. of Patients
1	High Scrotal	0
2	Inguinal	18
3	Emergent	0
4	Ectopic	0
	Total	18

Table V Associated with detectable hernia

S.NO	HERNIA- Clinically obvious	No. of Patients
1	Present	06
2	Absent	19
	Total	25

Table VI Side of Undescended Testis

S.NO	Side of UDT	No. of Patients
1	Right	11
2	Left	11
3	Bilateral	3
	Total	25

Table VII Scrotal Rugosity on Affected Side

S.NO	Rugosity	No. of Patients
1	Well Marked	03
2	Minimal	20
3	Not Developed	2
	Total	25

Table VIII Ultrasonography

S.NO	USG	No. of Patients
1	Intracanalicular	16
2	Intra Abdominal	04
3	In Conclusive	05
	Total	25

Table IX : Position of Testis in Diagnostic Laparoscopy

S.NO	Site of arrest	No. of Patients
1	At Internal Inguinal Ring	0
2	<1 Inch above Internal Ring	01
3	>1 Inch above Internal Ring	01
	Total	02

Table X: Ultrasonography Inconclusive in 5 Patients

S.NO	USG Report	No. of Patients
1	Wrong Location	01
2	Not Located	04
	Total	05

Table XI Operative Findings in Patients with Inconclusive USG Report

S.NO	Location of Testis	No. of Patients
1	Intra Abdominal	03
2	At Internal Inguinal Ring	0
3	Intra Canalicular	02
	Total	05

Table XII Position Of Testis at Surgery

S.NO	Position	No. of Patients
1	Intra-Canaliclar	16
2	At Internal Ring	01
3	Above Internal Ring	07
4	At External Ring	01
	Total	25

Table XIII: Patent Processus Vaginalis in Operated Patients

S.NO	Process Vaginalis	No. of Patients
1	Present	25
2	Absent	0
	Total	25

Table XIV: Detected Associated Congenital Anomalies

S.NO	Anomaly	No. of Patients
1	Hypospadias	01
2	Congenital diaphragmatic Hernia	0
3	B/L hydronephrosis and Hydroreter	0
	Total	01

Table XV: Operative Procedures

S.NO	Procedre	No. of Patients
1	Dartos pouch orchiopexy	19
2	Open Orchiectomy	04
3	Fowler Stephens procedure	0
4	External anchorage	0
5	Laparoscopic Orchiectomy	2
	Total	25

Table XVI: Vaso Epididymal Anomalies in Operated Cases

S.NO	Cases	No. of Patients
1	Long Looping of Vas & Elongated epididymis with flimsy attachment to Testis	02
2	Vas & vessel end Blindly	0
3	Vas & epididymis apparently normal	23
4	Testis separated from vas & epididymis by wide mesentery	0
	Total	25

Table XVII: Postoperative Complication

S.NO	Complication	No. of Patients
1	Wound Infection	0
2	Hematoma	01
3	Torsion	0
4	Retraction of Testis	0
5	Atrophy	0
	Total	01

Table XVIII: Follow up after 6 Months

S.NO	Follow up	No. of Patients
1	Remarkable increase in size	0
2	No Remarkable increase in size/same size	11
3	Remarkable decrease in size	0
	Total	11

Table XIX: Follow up after 1 Year

S.NO	Follow up	No. of Patients
1	Remarkable increase in size	0
2	No Remarkable increase in size/same size	09
3	Remarkable decrease in size	0
	Total	09

Table XX: Follow up after 2 Years

S.NO	Follow up	No. of Patients
1	Remarkable increase in size	0
2	No Remarkable increase in size/same size	05
3	Remarkable decrease in size	0
	Total	05

V. Discussion

Undescended testis is one of the anomalies, which has been studied since over hundreds of years. Many authors have worked over it and many studies have been conducted. In our prospective study of 25 cases of undescended testis, we tried to enlighten few aspects of undescended testis.

1) Age of presentation;

A wide range was seen our study of 25 cases. We found 3 cases between 0 to 6 months of age (12%), 3 cases between 6 months to 2 years of age (12%), 10 cases between 2 years to 5 years of age (40%), 7 cases between 2-5 years of age (28%), and 2 cases more than 15 years (8%). We did this breakup according to histological changes typified for these age groups. We consider these histological changes occurring with age as very important as they determine the prognosis regarding fertility after operation.

Histological analysis of cryptorchid testes before puberty in particular, has resulted in a dramatic alteration in the recommended age of orchiopexy. Within the first months of life, the number of germ cells in cryptorchid and descended testes is equal; by the end of first year, however, differences already exist although the mean number of germ cells in both equal, a wide standard deviation exists among cryptorchid testes, implying that some already have diminished germs cells(Mengal et al).By the second year, germ cells counts within the cryptorchid testes are markedly diminished, with approximately one fifth of the patients already demonstrating complete absence¹⁵ (Hadziselimovic, 1981)

By 3 years of age, about one third have normal germ cells counts, one third have markedly diminished counts. The potential for fertility may be maximized, if an orchiopexy is done by the age of 6 months. It is also stated that the pathological alteration of germinative epithelium increase in undescended testis beyond 2 years of age. Pathological alterations occur in germinative epithelium and are caused by dystrophy of testes, so medical treatment should be carried out before 6 months of age. It is now current practice to recommend orchiopexy at 6 months. This is because; signs of damage to the testis are identified at about 6 months of age.¹⁵ (HuffD.) S. 1993)

In our study, 22 patients presented after 6 months, and only 3 Cases presented less than 6months of age. This might be due to poor awareness among the patients or misdiagnosis on the part of family physician.

Mode Of Presentation

In our study of 25 cases, the mode of presentation varied, 23 cases presented as undescended testis (92%), one cases as an obstructed inguinal Hernia with torsion 4%, one case presented with other anomalies, when undescended testis was discovered incidentally. The incidence of torsion is known to be higher in undescended testes than in normal testes. It may reach up to 20% of all undescended testis⁴². This is because the testicle is not in its normal anatomic place, which will amplify any force orstrain to an undesirable stress for the testicle.

Side Of Undescended Testis

We studied, the side on which undescended testis get arrested during its descent, more frequently. The incidence of bilateral Cryptorchidism is 10%²⁵ (Sydenerand chaffin 1955).

According Bailey and Love²⁰ (2008), the right testis is affected in 50% of cases, the left testis is affected in 30% of cases, and double arrest occurs in 20% of cases. In our study we had 11 cases of right sided undescended testis (44%), 11 cases of left sided undescended testis (44%) and 3 cases of bilateral Cryptorchidism 12%.

Bailey and Love feel that 80% undescended testis in infants are highly retractile type and need no therapy. Bill and Shanhan²⁶ (1970) studied 100 patients of undescended testis. They had 76 patient of unilateral Cryptorchidism and 24 patients with bilateral Cryptorchidism. In our series we noticed 22 cases of unilateral Cryptorchidism (88%) and 3 cases of bilateral Cryptorchidism (12%).

4. The frequency of arrest of undescended testis at various sites Scorer and Farrington⁸ (1972) have recommended the following criteria in order to reduce the number of false positive cases.

- A) Undeveloped or relatively less developed scrotum on the affected side.
- B) A careful examination on two separate occasions in supine, erect and cross leg position.

- C) The testis should be considered present, if there is a reliable history of it being previously palpable.
- D) The testis if palpable is coaxed down into the scrotum to touch its bottom, between the pulps of index finger and thumb.
- E) In 90% cases there is an associated hernia on the affected side or associated patent processus.

Lous Orr has described a test for diagnosing highly retractile testis. In difficult cases the young patient is asked to sit on chair and hug his knees to his chest. Pressure thus directed on to inguinal canal causes a retractile testis to descend into the scrotum. In a study conducted by Kleinteich et al, 12.21% of cryptorchid testis were intraabdominal, 67.54% were inguinal in position, 23.89% were pre-scrotal and 11.52% were ectopic. In our series of 25 cases, 16 testes (64%) were intra Canalicular, 1 at internal ring, 7 were above internal ring (28%) and one testis (4%) at external ring in our study we had not included any case of ectopic testis.

5) Associated inguinal hernia as processus vaginalis does not close at birth, in cases of undescended testis, processus vaginalis does not obliterate unless the testis reaches the scrotum. This will predispose to indirect inguinal hernia with possible subsequent incarceration and strangulation^(43,44).

Detecting an inguinal hernia is an indication for immediate surgical intervention to perform both herniorrhaphy and orchiopexy^(42,43,44,45). Patients may present with an inguinal hernia on affected side.

In our study we noticed clinically detectable hernia in 6 patients (24%) and 19 patients (76%) did not have a clinically detectable hernia. Out of our 25 patients, all had a patent processus vaginalis.

6) Impalpable testes;

According to Stanley Kogan², impalpable testis occurs in approximately 20-30% of cryptorchid population. Of these, 45% are abdominal, 45% are retractile and up to are 25% canalicular⁴².

In our study of 25 patient 18 presented with palpable testis (72%) and 7 patients had impalpable testis (28%).

7 Ultra sonography

In our study Ultrasonography was performed in all of the patients who presented with undescended testis. We studied the role of Ultrasonography in localizing the testis we performed Ultrasonography in 25 patients out of 25.

According to a prospective study Ultrasonography was compared to palpation in 41 patients in which testis was not present in scrotum. A testis was palpable in 20 of these instances and nonpalpable in 21 patients. Of 20 of palpable testes 14(70%) were identified by Ultrasonography. In 21 patients of impalpable testes, 3 intra abdominal and 5 inguinal testes were identified at exploration. In this study Weiss R M and all concluded that Ultrasonography cannot stand alone as a screening modality in the management of undescended testes. In our study, amongst 25 patients, who underwent Ultrasonography USG located testis in 20 patients (80%) and in 5 patients (20%) Ultrasonography could not locate testis.

8) Associated congenital anomalies;

Undescended testis occasionally present with other congenital abnormalities. In our study only one case (4%) of undescended testes presented with Hypospadias, and none presented with other congenital abnormalities. According to Raff R, Shubert R²⁷, (1998), if hermaphrodite genitals are present in a patient or a higher degree of hypospadias is shown with maldescended testes, chromosomal disorder must be considered as one potential cause of the anomaly.

9) Vaso epididymal anomalies vaso epididymal anomalies are common and associated, with undescended testis. Vaso epididymal anomalies contribute in deciding prognosis of fertility after orchiopexy. According to a study by Lishult Zandetal (1976)²⁸, the data indicates that spermatogenesis may be abnormal after orchiopexy and suggest that men with unilateral undescended testis may have bilateral testicular abnormality.

A prospective study was conducted by Marshall F F, Shermata D W²⁹ (1979). In study of 42 patients undescended testis 15 (36%) had epididymal abnormalities.

In another study by Koff W J and Scaletschky R (1990)³⁰, they studied 66 patients. In their study abnormalities of vas and epididymis ranged from simple epididymal elongation to more complex forms like complete disruption between the testis and epididymis. Among 33 cryptorchid testis, 29(87%) patients have elongation and more complex forms of anomalies.

Mollacian M, Mehrabi V and Elahi B (1994)³¹ have conducted a study in 652 cases of undescended testes. They found vasal and epididymal anomalies with an overall frequency of 36% (235 cases out of 652 cases). They noticed elongated epididymis and flimsy attachment of head of epididymis to the testis constituted the most common anomaly.

In our study of 25 cases of undescended testis, we noticed vaso epididymal anomalies in 2 cases 8%. We noticed that in these 2 cases, long looping vas and elongated epididymis with flimsy attachment to testis was present. In the remaining 23 cases vas and epididymis were apparently normal.

10) Orchidectomy

In our series we performed orchidectomy in 6 patients. Out of Which all 6 were in the pediatric age group According to Martin D C and Menke HR³² (1975), the patient seen after puberty with an intra abdominal unilateral undescended testis should have orchidectomy. They also mention that the patient seen after puberty and before the age of 50 year with unilateral undescended testis in inguinal region should have orchidectomy because the risk of death from malignancy exceeds the risk of anesthesia and orchidectomy.

11) Orchiopexy

In our study of 25 cases of undescended testis, we performed sub-dartos pouch orchiopexy in 19 patients and 6 patients underwent orchidectomy. In a study, 167 patients underwent orchiopexy, by subdartos pouch technique and these patients were followed up for 1-3 years. At follow up, 6 testes were found to have retracted out of the scrotum. One testis was hypoplastic in the scrotal pouch and another infixed in the groin after 1st stage of planned orchiopexy. Remaining 159 testes were entirely satisfactory. The overall success rate was 95.2%³³ (Brown S, Mackinnan A E, 1979).

In another study the subdartos pouch operation has been used in more than 200 consecutive orchiopexies with no scrotal hematomas, testicular atrophy or retraction of testis³⁴. (Redman J F 1990).

In our study, 19 patients have undergone subdartos pouch orchiopexy. Results are quite satisfactory. Only one had post operative complication.

12) Post operative complications in operated cases of orchiopexy;

In our study there was only one case of haematoma post operatively. No incidence of any scrotal skin infection, atrophy, retraction of testes after orchiopexy. As per Kogan et al 1986, the cited complication rate has been significantly gone down due to major refinements in the surgical treatment. With present technique one can achieve scrotal placement of virtually all testes, often with a single surgical procedure. The cited complication rate of 1-2% vas injury and 2% atrophy in palpable testis is realistic; the previous 20-50% complication rate in impalpable testis continues to be improved upon.

13) Size of undescended testis;

During surgery we also noticed that undescended testis had smaller size as compared to normally descended contra lateral testis.

According to Stanley Kogan, normally descended testis undergoes age dependent progressive development, but the developmental changes are consistently retarded in undescended testis.

According to Jack S Elder²³ unilateral undescended testis is always smaller than the normally descended testis. In our study we measured the size of undescended testis intra Operatively and preoperative with USG as compared to other normal side, we found all the undescended testes were of smaller size as compared to the normal side.

In our study of 25 patients 6 patients underwent orchidectomy, out of 19 patients we had done follow up of 11 patients after 6 months, 4 patients hadn't completed 6months after orchidopexy and 4 patients we lost follow up we found same size in all 11 patients and none with decrease in size or retraction of testis on the operated side. Same patients in one year follow up study; we again lost two more patients in follow up. Out of 9 we found same size in all 9 patients and no retraction of testis on operated side.

In the 2 years follow up , we had done follow up of only 5 patients as 4 patients who had not completed 2 years, were excluded from follow up study. Out of 5 patients, we found same size in all 5 patients and none were found to have decrease in size or retraction of testis on the operated side.

The testis remaining of same size postoperatively may be hypoplastic not responding to the reduction in temperature postoperatively. However the diagnosis of hypoplasia needs conformation by biopsy and histopathological examinations.

Decrease in size of testis postoperatively might be due to vascular compromise or inherent process of hypoplasia started preoperatively within it. In our present study we have not included the treatment of undescended testis with hormonal therapy.

Men with an undescended testis have been classically shown to have lower sperm counts, poorer quality sperms and lower fertility rates than men whose testicles descent normally⁴⁴. In a study of testicular biopsy done at the time of orchiopexy showed that germ cell density starts decreasing overtime beginning as early as one year of age. This has been classically related to the fact that the undescended testis is not lying in the 33 degree Celsius environment which is necessary for spermatogenesis⁴⁴. A recent study on patients with

history of cryptorchidism found that the sperm counts ranged from 22 to 61 million per millilitre, motility and morphology were more than 50% in all specimens and no significant pyospermia, agglutination or hyperviscosity.

However, studies of the nucleus showed that the nuclear annulus of the nuclear matrix was disrupted, thus preventing the ability to organize DNA into specific loop domains (organization of DNA in 3D domains is intimately associated with sperm function).

The study concludes that in these patients fertilization occurs, however, the disruption of the nuclear matrix will prevent further cleavage of the embryonal cells⁴⁶.

VI. Conclusion

1. In our study we noticed that the maximum number of cases were between 6 month to 5 years, may be due to the concern of the parents.
2. Subdartos pouch orchiopexy is simple technique for placement of undescended testis in the scrotum with low complication rate and high success rate. Now a day's laparoscopy is a popular aid in localization of impalpable testis and treatment of high undescended testis.
3. Hypospadias and bilateral hydronephrosis and hydroureter were common associated anomalies with undescended testis with incidence of 4-6% each.
4. It was observed that early surgical intervention prevents the complication of undescended testis like torsion and strangulation.
5. From our study we conclude that early orchidopexy increases the chances of attainment of normal testicular size as compare to late surgery.

To comment on fertility in patients of undescended testis long term follow-up is necessary.

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