

A clinical study on undescended testis

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Citation this Article: C. Ravi Teja Jampani, Dr. S. V. Panchabhai, Dr. Aishwarya Purohit, Dr. Prabhat Nichkaode, “A clinical study on undescended testis”, IJMSIR- April - 2022, Vol – 7, Issue - 2, P. No. 190 – 203.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Background: This study is conducted to know proper diagnostic evaluation and surgical intervention in undescended Testis by studying various anatomical sites of arrest in Undescended Testis, in the patients in the patients of age group 1 to 20 years with or without associated congenital anomalies.

Materials and methods: Prospective Observational study was conducted in our institute from August 2019 to October 2021 following approval from Ethical committee of hospital.

Result: Mean age of 30 study sample was 6.4 years (SD +/- 5.07 years. There were 16 (53%) Right sided Undescended Testis & 10 (33%) Left sided Undescended Testis patients, of which 12(40%) subjects have Undescended Testis at Inguinal canal, 9(30%) have undescended Testis at superficial ring, located with the help of USG and the 4(13%) Intra-abdominal

Undescended testes location was confirmed by MRI. 23(77%) underwent Unilateral Orchidopexy, 10% underwent Bilateral Orchidopexy, while Unilateral Orchiectomy was done in (3)10% and Bilateral Orchiectomy was done in 3%. 18(60%) had associated Congenital Hernias, 6(20%) had associated Hydrocele, while only 1(3%) had associated phimosis, 1(3%) had associated Umbilical hernia & 1(3%) had AnoRectal Malformation (ARM) as Congenital Anomalies, which were also treated. All the subjects that underwent Orchidopexy were followed up till 6 months after surgery and had No atrophy of Testis on operated side.

Conclusion: As per our study, USG was found to be reliable investigation in Localization of the site of Undescended Testis and was a better investigation for diagnostic evaluation and ORCHIDOPEXY can be established as definitive surgery with no significant complications.

Keywords: Undescended Testis, Orchidopexy, Orchidectomy, Congenital Anomalies

Introduction

UNDESCENDED TESTIS is a condition in which the testis does not reach the scrotum but is present somewhere along the usual embryological descent route and cannot be moved to touch the scrotum's base [1]. The most frequent urogenital congenital defect is an undescended testis, which affects up to 30% of preterm and 3% of full-term newborns [2,3]. One of the most essential aspects of undescended testis is clinical diagnosis, since the retractile testis is easily mistaken for cryptorchidism [4]. An undescended testis might also be confused with an ectopic testis. Examinations such as Ultrasound, Venography, CT scan, MRI, or Peritoneoscopy [5] may be used to confirm the location of an undescended testis. In most cases of undescended testis, spontaneous testis descent occurs within the first three months following birth. If there is no sign of testis descent, orchidopexy can be performed as early as 6 months of age [6]. Because of poor semen quality in adulthood, cryptorchidism is linked to male infertility. Sertoli cell function is hampered, as is the function of Leydig cells [7].

Testicular dysgenesis is characterised by cryptorchidism, hypospadias, testicular malignant development, and low semen quality (TDS). This disease is thought to be caused by unknown factors that disrupt embryonal development. Testicular dysgenesis is characterised by cryptorchidism, hypospadias, testicular malignant development, and low semen quality (TDS). Unknown reasons that impair embryonal programming and gonadal progression throughout foetal life are thought to be the cause of this disorder. Our research focuses on the critical clinical characteristics of undescended testis that

aid in the selection of the most appropriate surgical solution.

Materials and methodology

This is a Prospective observational case study, that was conducted on the patients in the Department of General Surgery at Dr. D. Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune from August 2019 to October 2021. Institute Ethics Committee clearance was obtained before the start of the study. Written and informed consent of all patients were taken prior to their enrolment in the study for research publication (Appendix A). The Sample size in our institute was 30 patients.

Inclusion criteria

All the patients of age group 1-20 years investigated and diagnosed as undescended testis with or without associated congenital anomalies.

Exclusion criteria

Ectopic testis,

Based on the selection criteria patient admitted with Impalpable testis, examined clinically, and the clinical location of the Undescended Testis is confirmed by USG and MRI and all those who fulfilled the inclusion criteria were eligible to participate in the study. Preoperatively all patients were subjected to all routine investigations for anaesthesia and surgical fitness. Post-operatively, the patients were followed up for six months.

Orchidopexy

The surgical therapy for the palpable Undescended testis is orchidopexy with creation of a sub-dartos pouch. Fixation is achieved by the scarring of the everted tunica vaginalis to the surrounding tissues. The Bianchi single high scrotal incision is an optional technique for orchiopey in boys with Undescended testis situated distal to the external inguinal ring. The retroperitoneal dissection is however crucial for the success of any

surgical procedure. For laparoscopic orchidopexies of intra-abdominal testicles, the success rates are above 90%.



Fig. 1: Intra op pic of Orchidopexy.



Fig. 2: Intra op pic of Orchidectomy in an adolescent male showing Atrophic testis

Orchidectomy

For post-pubertal adolescents and healthy men younger than 50 years of age with unilateral UDT and normal contralateral testis, an orchidectomy should be offered, as the apparent loss of function and malignant potential of the Undescended Testis have swayed many authors towards doing orchidectomy for the adult patient, rather than orchidopexy.

Result & Analysis

Table 1: Distribution of Age in Group

Age in Group	Frequency	Percentage
1-10	24	80.0%
11-20	6	20.0%
Total	30	100.0%

In our study, 24 (80.0%) patients were 1-10 years of age and 6 (20.0%) patients were 11-20 years of age.

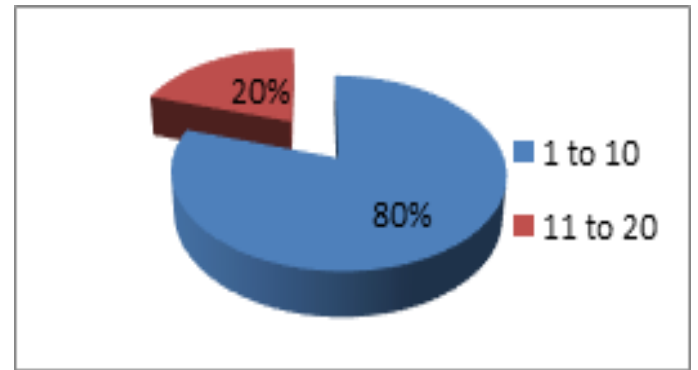


Fig. 3: Pie Diagram: Age distribution in groups.

Table 2: Distribution of Chief complaints

Chief Complaints	Frequency	Percentage
Bilateral Impalpable testis	4	13%
Left Impalpable testis	10	34%
Right Impalpable testis	16	53%
Total	30	100.0%

In our study, 4 (13%) patients had Bilateral Impalpable testis, 10 (34%) patients had Left Impalpable testis and 16 (53%) patients had Right Impalpable testis in Chief Complaints.

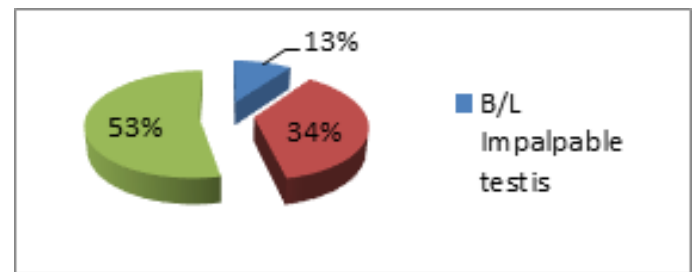


Fig. 4: Pie Diagram: Distribution of Chief Complaints

Table 3: Distribution of Clinically Palpable/Impalpable Testis in Scrotum.

Palpable/Impalpable in Scrotum	Frequency	Percentage
Bilateral Impalpable Testis	4	13%
Left Impalpable Testis	10	34%
Right Impalpable Testis	16	53%
Total	30	100.0%

In our study, 4 (13%) patients had Bilateral Impalpable Testis, 10 (34%) patients had Left Impalpable Testis and 16 (53%) patients had Right Impalpable Testis in Scrotum.

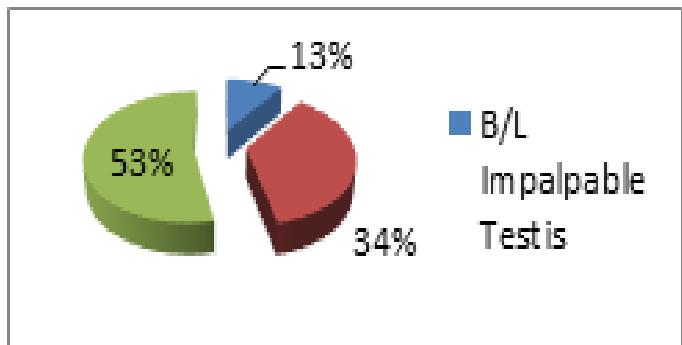


Fig.5: Pie Diagram: Distribution of Palpable/Impalpable Testis in Scrotum

Table 4: Distribution of location of Undescended Testis.

Clinical Location of UDT	Frequency	Percentage
Superficial Ring	9	30%
Inguinal Canal	12	40%
Deep Ring	5	17%
Intra-Abdominal(probable)	4	13%
Total	30	100.0%

In our study, 9 (30.0%) patients had Testis at Superficial Ring, 12 (40.0%) patients had Testis at Inguinal Canal, 5 (16.7%) patients had Testis at Deep Ring and 4 (13.3%) patients had Intra-Abdominal Testis. The value of z is

0.812. The value of p is .041794. The result is not significant at $p < 0.05$.

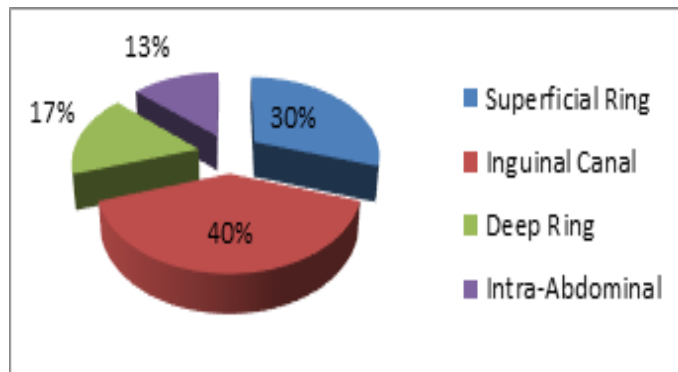


Fig. 6: Pie Diagram: Distribution of Location of Undescended Testis

Table 5: Distribution of Unilateral or Bilateral Undescended Testis

Unilateral or Bilateral	Frequency	Percentage
Bilateral	4	13%
Unilateral	26	87%
Total	30	100.0%

In our study, 4 (13.3%) patients were having Bilateral and 26 (86.7%) patients were having Unilateral Undescended Testis.

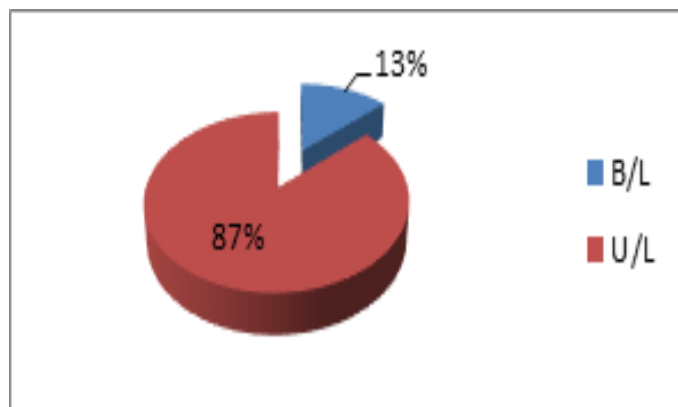


Fig. 7: Pie Diagram: Distribution of Unilateral & Bilateral Undescended Testis

Table 6: Distribution of Side in Unilateral Undescended Testis

SIDE	Frequency	Percentage
Left	10	38%
Right	16	62%
Total	26	100.0%

In our study, 10 (38.5%) patients had Left Undescended Testis and 16 (61.5%) patients had Right Undescended Testis.

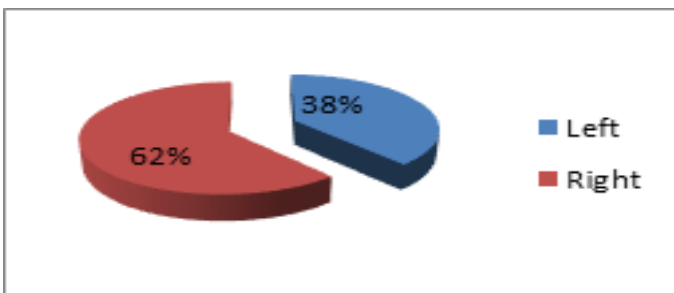


Fig. 8: Pie Diagram: Distribution of Side of Unilateral Undescended Testis

Table 7: Distribution of USG Location of Undescended Testis

USG Location	Frequency	Percentage
Deep ring	6	20.0%
Inguinal canal	11	36.7%
Intra-abdominal	4	13.3%
Superficial ring	9	30.0%
Total	30	100.0%

In our study, Ultrasonography revealed that 6 (20.0%) patients had Testis at Deep ring, 11 (36.7%) patients had Testis at inguinal canal, 4 (13.3%) patients had Intra-abdominal Testis and 9 (30.0%) patients had Testis at Superficial ring in USG Location. The value of z is 0.5477. The value of p is .058232. The result is not significant at $p < .05$.

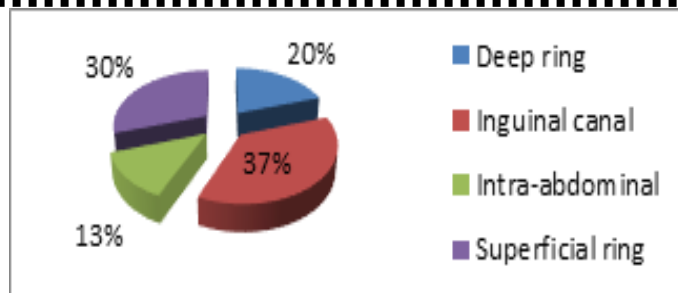


Fig. 9: Pie Diagram: Distribution of USG location of Undescended Testis

Table 8: Distribution of Confirmation of Intra-abdominal Testis

Imaging study	Frequency	%	Diagnosing the location of Undescended Testis	Confirmation of the location of Intra-abdominal Undescended Testis
USG	26	100%	Yes	No
MRI	4	13%	Yes	Yes

In our study, Ultrasonography helped in diagnosing the localization of Inuinal Undescended Testis (87%) and the intra-abdominal testis (13%) was diagnosed with USG, but exact localization was done with the help of MRI

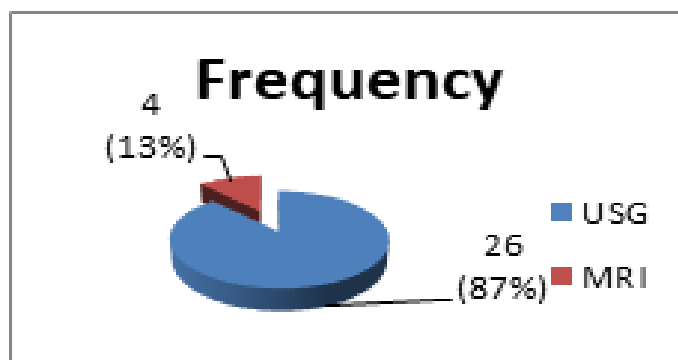


Fig. 10: Pie Diagram: Distribution of MRI localization of Intra-abdominal Undescended Testis

Table 9: Distribution of Associated Anomalies

Ass Neonatal Anomalies	Frequency	Percentage
Anorectal Anomalies	1	3.3%
Left Hydrocele	2	6.7%

Left Congeital Hernia	7	23.3%
Left Retractable Testis	1	3.3%
Right Congenital Hernia	9	30.0%
Right Congenital Hernia & Umbilical Hernia	1	3.3%
Right Congenital Hernia with Phimosis	1	3.3%
Right Hydrocele	5	16.7%
No	3	10%
Total	30	100.0%

In our study, 7(23.3%) patients had Left Congenital Hernia, 9(30.0%) patients had Right Congenital Hernia and 5 (16.7%) patients had Right Hydrocele in Associated Neonatal Anomalies. Additionally, it is found that 1(3.3%) patient presented with the complication of torsion of Undescended testis. The value of z is 0.6105. The value of p is .054186. The result is not significant at $p < .05$.

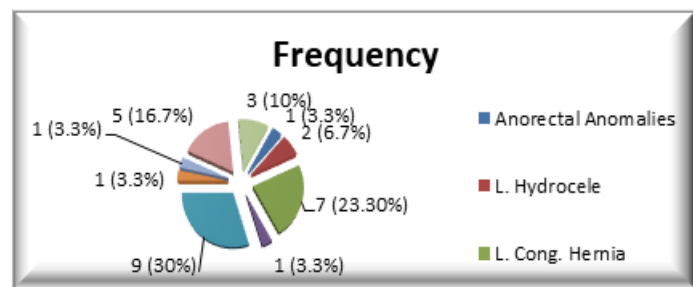


Fig. 11: Pie Diagram: Distribution of Associated Anomalies

Table 10: Distribution of Different types of Surgeries done

Surgery Done	Frequency	Percentage
Bilateral Orchiectomy	1	3.3%
Bilateral Orchiopexy	3	10.0%
Left Orchiectomy	1	3.3%

Left Orchiopexy	9	30.0%
Right Orchiectomy	2	6.7%
Right Orchiopexy	14	46.7%
Total	30	100.0%

In our study, 1 (3.3%) patient had under went Bilateral Orchiectomy, 3 (10.0%) patients had undergone Bilateral Orchiopexy, 1 (3.3%) patient had under went. Left Orchiectomy, 9 (30.0%) patients had undergone Left Orchiopexy, 2 (6.7%) patients had under went Right Orchiectomy and 14 (46.7%) patients had under went Right Orchiopexy. The value of z is 1.3276. The value of p is .018352. The result is not significant at $p < .05$.

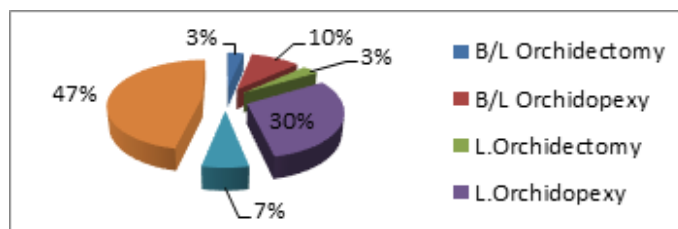


Fig. 12: Pie Diagram: Distribution of Different Surgeries done

Table 11: Distribution of Surgeries done to correct associated Congenital Anomalies

Associated Neonatal Anomalies	Frequency	%	Surgery done in addition to Orchiopexy
Ano-Rectal Malformation	1	4%	PSARP
Left Congenital Hernia	7	27%	Left Herniotomy
Right Congenital Hernia	9	34%	Right Herniotomy
Left Congenital Hydrocele	2	8%	Left Herniotomy

Right Congenital Hydrocele	5	19%	Right Herniotomy
Right Congenital Hernia with Umbilical hernia	1	4%	Right Herniotomy with Anatomical Repair
Right Congenital Hernia with Phimosis	1	4%	Right Herniotomy with Circumcision

In our study, it was found that 26 out of 30, had associated Congenital Anomalies, among them Right Herniotomy (34%) for Right congenital hernia followed by Left Herniotomy for (27%) Left congenital hernia, right (19%) and left (8%) Herniotomy were done for Right & Left Hydroceles. Associated Ano-Rectal malformation, phimosis, umbilical hernia are treated by PSARP (4%), Circumcision (4%), Anatomical Repair (4%).

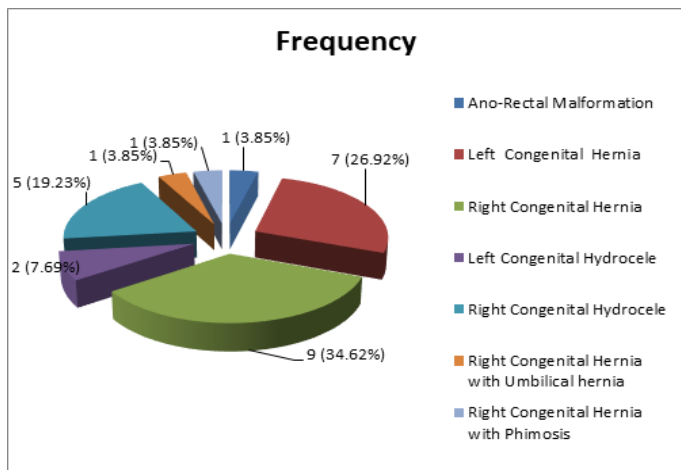


Fig.13: Pie Diagram: Distribution of Additional Surgeries done to correct associated Congenital anomalies.

Table 12: Distribution of INTRA-OP Location of Testis

Intra Op Findings	Frequency	Percentage
Superficial Ring	9	16.7%
Inguinal canal	12	40.0%
Deep Ring	5	13.3%
Intra-Abdominal	4	30.0%
Total	30	100.0%

In our study, 9 (30.0%) patients had Testis at Superficial Ring, 5 (16.7%) patients had Testis at Deep Ring, 12 (40.0%) patients had Testis at inguinal canal, 4 (13.3%) patients had Intra-abdominal Testis Intra operatively. The value of z is 0.812. The value of p is .041794. The result is not significant at $p < .05$.

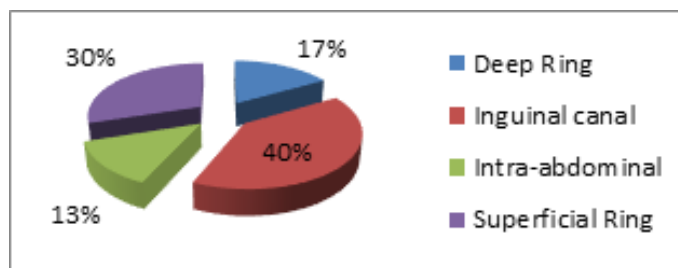


Fig. 14: Pie Diagram: Distribution of INTRA-OP Location of Testis

Table 13: Distribution of Immediate Post Op Complications.

Post Op Complications	Frequency	Percentage
No	27	90.0%
Haematoma	1	3.3%
Wound gaping	2	6.7%
Total	30	100%

In our study, only 3 (10.0%) patients developed early Post Op Complications, of which 1(3.3%) patient had seroma & 2(6.7%) had wound gaping as Post Op Complications.

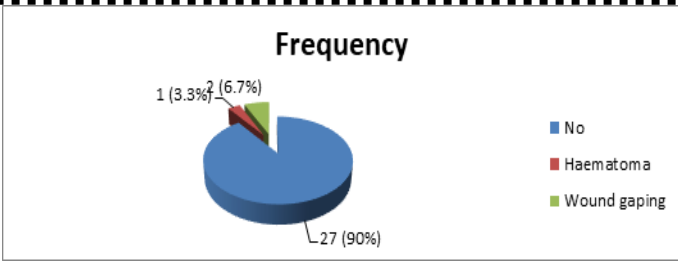


Fig.15: Pie Diagram: Distribution of POST OP COMPLICATIONS

Table 14: Distribution of HPE FINDING

HPE Finding	Frequency	Percentage
Left Atrophic Testis	1	3.3%
Not Applicable	26	86.7%
Right Atrophic Testis	2	6.7%
Bilateral Atrophic Testis	1	3.3%
Total	30	100.0%

In our study, 1 (3.3%) patients had Left Atrophic Testis, 2 (6.7%) patients had Right Atrophic Testis and 1 (3.3%) patient had Bilateral Atrophic Testes in Histo-Pathological Report. The value of z is 6.2106. The value of p is < .00001. The result is not significant at $p < .05$.

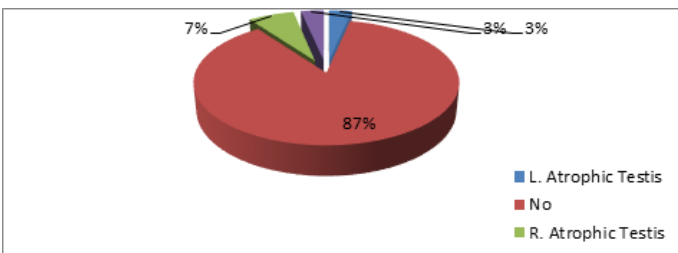


Fig.16: Pie Diagram: Distribution of HPE FINDING

Table 15: Distribution of Follow up after 3Weeks

F/U 3WEEKS	Frequency	Percentage
No Atrophy	26	100.0%
Total	26	100.0%

In the follow up USG after 3 weeks, there was no atrophy of the operated Testis by Orchidopexy in all the 26(100%)

patients



Fig.17: Pie Diagram: Distribution of F/U 3WEEKS

Table 16: Distribution of Follow-up after 3Months

F/U 3MONTHS	Frequency	Percentage
No Atrophy	26	100.0%
Total	26	100.0%

In the follow up USG after 3 months, there was no atrophy of the operated Testis by Orchidopexy in all the 26(100%) patients

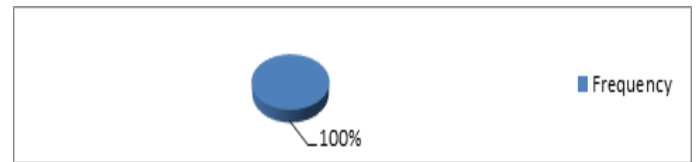


Fig.18: Pie Diagram: Distribution of F/U 3MONTHS

Table 17: Distribution of Follow up after 6Months

F/U 6MONTHS	Frequency	Percentage
No Atrophy	26	100.0%
Total	26	100.0%

In the follow up USG after 6 months, there was no atrophy of the operated Testis by Orchidopexy in all the 26(100%) patients.

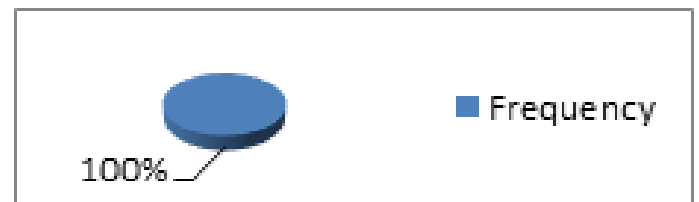


Fig. 19: Pie Diagram: Distribution of F/U 6MONTHS

Table 18: Distribution of mean AGE

	Num ber	Mea n	SD	Minim um	Maxim um	Medi an
Age	30	6.40	5.07	0.1000	20.000	5.500
	33		17		0	0

In above table showed that the mean Age (mean±s.d.) of patients was 6.4033± 5.0717.

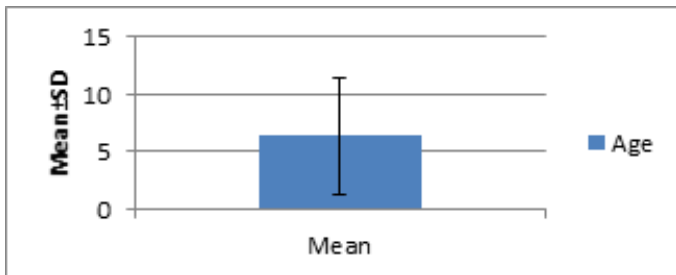


Fig. 20: Bar Diagram: Distribution of mean AGE

Table 19: Distribution of mean SIZE OF UDT and Contralateral NDT

Descriptive Statistics			
	Mean	Std. Deviation	N
Size of udt	1.80620cm ³	1.006818	30
C/l ndt	9.973 cm ³	9.6479	30

SIZE OF Undescended Testis In

Above table showed that the mean UNDESCENDED TESTIS c (mean±s.d.) of patients was 1.80620± 1.006818cm³

OPP.SIDE Testis SIZE

In above table showed that the mean CONTRALATERAL NORMAL DESCENDED TESTIS c (mean±s.d.) of patients was 9.973± 9.6479cm³

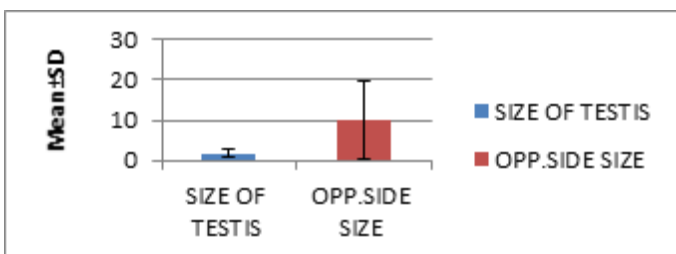


Fig. 21: Bar Diagram: Distribution of mean Size OF UDT and Contralateral NDT

Table 20: Correlation between SIZES OF Undescended Testis vs Contralateral Normal Descended Testis (NDT) SIZE

		Contralateral NDT SIZE c	Remarks
Size of Testis	Pearson Correlation Coefficient (r)	.313	Positive Correlation
	p-value	.093	Not significant
	Number	30	

The value of Pearson Correlation Coefficient (r) was .313. The positive correlation was found between SIZE OF UNDESCENDED TESTIS vs CONTRALATERAL NORMAL DESCENDED TESTIS SIZE. The P-Value was .093. The result was not statistically significant.

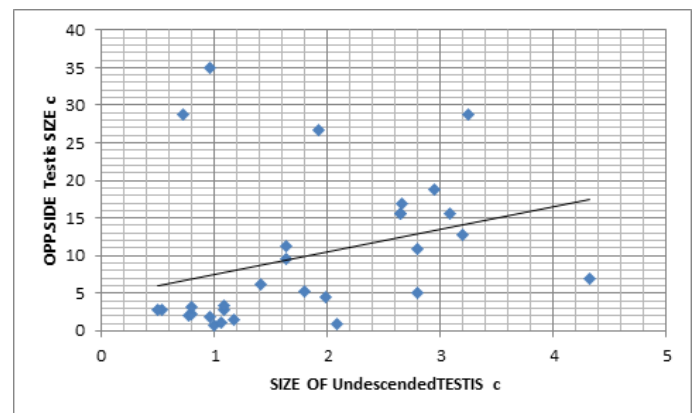


Fig. 22: Correlation between SIZE OF Undescended TESTIS vs OPP.SIDE Testis SIZE

Discussion

This Prospective observational study was conducted on the patients in the Department of General Surgery and Paediatric surgery at Dr. D. Y. Patil Medical College Hospital and Research Centre, Pimpri, Pune from August 2019 to October 2021. All patients those investigated and diagnosed as undescended testis were included in this study. Total 30 patients were included in this study.

AGE: In our study, 24 (80.0%) patients were 1-10years. of age and 6 (20.0%) patients were 11-20years of age. The mean Age of patients was 6.4033± 5.0717 years.

Table 21:

Study	Number of patients	Mean Age
Himanshu Aggarwal et al [8] (2012)	77	5.6
J. T Viljoen et al [9] (2020)	106	25.4
Kai O Hensel et al [10] (2015)	3587	7.2
Christian Radmayr et al [11] (2016)	2762	6.9
Abdelmohesn S M et al [12] (2021)	467	5.8
Present study	30	6.47

Himanshu Aggarwal et al in 2012 studied the mean age of undescended testis to be 5.6 which is near comparison to our present study of mean age of 6.47. Christian Radmayr et al in 2016 studied the mean age of patients with undescended testis in a group of 2762 patients to be 6.9 & our study shows mean age of 6.47. Also Abdel Mohsen S M et al in 2021 studied in 467 patients of undescended testis the mean age to be 5.8 which we compared to our study and was correlating.

Side of undescended testis

Table 22:

Which is near comparison to our present study which shows 53% Right undescended testis? Schwentner C et al in 2005, studied that 50% of the cases showed Right Undescended testis in a group of 42 patients & our study shows 53% Right sided undescended testis. You J et al in 2020 studied 773 patients & found that 59% had Right undescended testis and when compared to our study, its correlating.

Size of undescended testis & contralateral normal testis.

Table 23:

Study	Number of cases	Mean size of Undescended Testis	Mean size of Contralateral Normal Descended Testis
Hester AG et al [18] (2016)	15	1.7cm ³	7.2cm ³
Martin Ritzen et al [19] (2007)	46	2cm ³	9.4cm ³
Present Study	30	1.8cm ³	9.9cm ³

Martin Ritzen et al studied 46 patients in 2007 and found the mean size of undescended testis as 2cm³ & the mean size of contralateral normal descended testis is 9.4cm³, which is near comparison to our study which showed the

Study	Number of cases	Left UDT %	Right UDT %	B/L UDT %
Schwentner C et al [13] (2005)	42	36%	50%	14%
Schleef J et al [14] (2002)	23	30%	57%	13%
Chang B et al [15] (2001)	80	35%	45%	20%
Mesrobian HG et al [16] (2002)	86	36%	48%	16%
You J et al [17] (2020)	773	28%	59%	12%
Present study	30	34%	53%	13%

mean size of undescended testis as 1.8cm³ in comparison with Contralateral normal descended testis with mean

size of 9.9cm³. Hester AG et al in 2016 studied the mean size of Unilateral undescended testis in a group of 15 patients and found the mean size of undescended testis as 1.7cm³ and the mean size of contralateral normal descended testis as 7.2cm³ and our study showed the mean size of undescended testis as 1.8cm³, whereas the mean size of Contralateral normal descended testis(NDT) is 9.9cm³

Different locations of undescended testes

Table 24:

Study	Number of cases	Inguinal %	Intraabdominal %
Schleef J et al [14] (2002)	23	87%	13%
Mesrobian HG et al [16] (2002)	86	68%	32%
Jha PK et al [20] (2016)	44	80%	20%
Present Study	30	87%	13%

Jha PK et al in 2016 studied the location of undescended testis in 44 patients in 2016 & found that 80% are located in Inguinal region, where as 20 % are intra-abdominal which is near comparison to our study that showed 87% of undescended testis are inguinal & 13% are intraabdominal. Schleef J et al studied 23 cases in 2002, which showed 87% of the undescended testis were inguinal and 13% are intraabdominal, which we compared to our study and is correlating.

Usg localization of undescended testis

Table 25:

Study	Number of cases	USG Reliability of UDT
Kim SO et al [21] (2015)	136	91.2%

Hester AG et al [18] (2016)	15	94%
Present Study	30	93%

Kim SO et al in 2015 studied the USG in localising the undescended testis and found out its reliability as 91%, which is near in comparison to our study, that showed USG reliability in localising Undescended testes as 93% Hester AG et al studied 15 cases of undescended testes in 2016 and found that USG reliability for localising Undescended testes was 94% and is very near when compared to our study which shows 93% of accuracy by USG for localising undescended testes.

Presence of associated congenital anomalies

Table 26:

Study	Number of cases	Associated Congenital anomalies%
Kim SO et al [21] (2015)	136	82%
Niedzielski et al [22] (2016)	42	80%
Present study	30	87%

Niedzielski et al in 2016 studied 42 cases of undescended testis in 2015 and found that 82% of the cases have associated congenital anomalies, which is near comparison to our study that shows 87% of cases with associated Congenital anomalies. Kim SO et al studied 136 patients for associated congenital Anomalies in Undescended Testis and found that 82% of the cases have associated congenital anomalies and when compared with our study, its correlating.

Age at which orchidopexy is performed

Table-27:

Study	Number of cases	1-2yrs %	2-5 yrs %	6-10yrs %	>10yrs %

Thorup et al [23] (2007)	104	32%	27%	20%	21%
Nieldzielski JK et al [22] (2016)	54	26%	32%	28%	14%
Present study	30	20%	30%	30%	20%

cases are in 1-2years of age group , 27% of the patients are in 2-5years of age group , 20% of the patients are in 6-10years of age group and 21% of the patients are having age greater than 10 years which is near comparison to our study that shows 20% of the cases belong to 1-2years of age, 30% belong to 2-5years of age, 30% belong to 6-10years of age and 20% belong to age more than 10years. In a study of 54 cases of undescended testis by Nieldzielski in 2016, it was found that 26% of the patients were 1-2years of age, 32% of the cases were 2-5years of age, 28% of the patients were 6-10years of age and only 14% of the patients were of age greater than 10years, which we compared to our study and was correlating.

Conclusion

The present study was conducted at a tertiary care hospital over a period of 2 years. The study included 30 cases of patients in the age group of 1 to 20 years presented with U/L or B/L impalpable Testes, with or without associated Congenital Anomalies. The maximum number of cases is recorded between 1 year to 5 years of age. The Study Confirmed that the size of Undescended Testis is smaller than the Contralateral Normal Descended Testis and Common site of arrest of Testis in its descent is [1] Inguinal canal followed by [2] Superficial ring. USG was found to be reliable investigation in Localization of the site of Undescended

Testis and was a better investigation for diagnostic evaluation according to our study. ORCHIDOPEXY can be established as definitive surgery with no significant complications according to our study.

References

1. Kaplan, G. W. (2003). The undescended testis: changes over the past several decades. *BJU international*. Supplement (Print), 92(1), 12-14.
2. Schwentner, C., Oswald, J., Kreczy, A., Lunacek, A., Bartsch, G., Deibl, M., & Radmayr, C. (2005). Neoadjuvant gonadotropin-releasing hormone therapy before surgery may improve the fertility index in undescended testes: a prospective randomized trial. *The Journal of urology*, 173(3), 974-977.
3. Martin Ritzén, E., Bergh, A., Bjercknes, R., Christiansen, P., Cortes, D., Haugen, S. E., ... & Virtanen, H. (2007). Nordic consensus on treatment of undescended testes. *Acta paediatrica*, 96(5), 638-643.
4. Schleeff, J., Von Bismarck, S., Burmucic, K., Gutmann, A., & Mayr, J. (2002). Groin exploration for nonpalpable testes: laparoscopic approach. *Journal of pediatric surgery*, 37(11), 1552-1555.
5. Williams, E. V., Appanna, T., & Foster, M. E. (2001). Management of the impalpable testis: a six-year review together with a national experience. *Postgraduate medical journal*, 77(907), 320-322.
6. Hadziselimovic, F. (2017). On the descent of the epididymo-testicular unit, cryptorchidism, and prevention of infertility. *Basic and clinical andrology*, 27(1), 1-16.
7. Rodprasert, W., Virtanen, H. E., Mäkelä, J. A., & Toppari, J. (2019). Hypogonadism and

- cryptorchidism. *Front Endocrinol (Lausanne)* 10: 906.
8. Aggarwal, H., Kogan, B. A., & Feustel, P. J. (2012). One third of patients with a unilateral palpable undescended testis have a contralateral patent processus. *Journal of pediatric surgery*, 47(9), 1711-1715.
 9. Viljoen, J. T., Zarrabi, A., & Van der Merwe, A. (2020). Management of cryptorchidism in adolescent and adult males. *African Journal of Urology*, 26(1), 1-6.
 10. Hensel, K. O., Caspers, T., Jenke, A. C., Schuler, E., & Wirth, S. (2015). Operative management of cryptorchidism: guidelines and reality—a 10-year observational analysis of 3587 cases. *BMC pediatrics*, 15(1), 1-9.
 11. Elder, J. S. (2016). Surgical management of the undescended testis: recent advances and controversies. *European Journal of Pediatric Surgery*, 26(05), 418-426.
 12. Abdelmohsen, S. M., Osman, M. A., Takrouney, M. H., El Debeiky, M., Hassan, A. B. G., Shalaby, M. M. A. E. A., & Baky Fahmy, M. A. (2021). A spectrum of epididymis and vas deferens anomalies among children with cryptorchidism: a retrospective multi-center study. *Annals of Pediatric Surgery*, 17(1), 1-13.
 13. Schwentner, C., Oswald, J., Kreczy, A., Lunacek, A., Bartsch, G., Deibl, M., & Radmayr, C. (2005). Neoadjuvant gonadotropin-releasing hormone therapy before surgery may improve the fertility index in undescended testes: a prospective randomized trial. *The Journal of urology*, 173(3), 974-977.
 14. Schleef, J., Von Bismarck, S., Burmucic, K., Gutmann, A., & Mayr, J. (2002). Groin exploration for nonpalpable testes: laparoscopic approach. *Journal of pediatric surgery*, 37(11), 1552-1555.
 15. Chang, B., Palmer, L. S., & Franco, I. (2001). Laparoscopic orchidopexy: a review of a large clinical series. *BJU international*, 87(6), 490-493.
 16. Mesrobian, H. G., Chassignac, J. M., & Laud, P. W. (2002). The presence or absence of an impalpable testis can be predicted from clinical observations alone. *BJU international*, 90(1), 97-99.
 17. You J, Li G, Chen H, Wang J, Li S. Laparoscopic orchidopexy of palpable undescended testes_ experience of a single tertiary institution with over 773 cases. *BMC pediatrics*. 2020 Dec;20(1):1-5.
 18. Hester, A. G., & Kogan, S. J. (2016). Proximally directed double-looped epididymis and vas deferens simulating vas duplication: the importance of precise definition of abnormal ductal anatomy in cryptorchidism. *Urology*, 97, 184-187.
 19. Martin Ritzén, E., Bergh, A., Bjercknes, R., Christiansen, P., Cortes, D., Haugen, S. E., ... & Virtanen, H. (2007). Nordic consensus on treatment of undescended testes. *Acta paediatrica*, 96(5), 638-643.
 20. Jha, P. K., Kumari, A., & Patel, D. Clinical Profile and Management Options in Patients with Undescended Testis.
 21. Kim, S. O., Na, S. W., Yu, H. S., & Kwon, D. (2015). Epididymal anomalies in boys with undescended testis or hydrocele: Significance of testicular location. *BMC urology*, 15(1), 1-4.
 22. Niedzielski, J. K., Oszukowska, E., & Słowikowska-Hilczer, J. (2016). Undescended testis—current trends and guidelines: a review of the literature. *Archives of medical science: AMS*, 12(3), 667.

23. Nordenskjöld, A. (2007). Referee-granskade vetenskapliga artiklar 2007-Institutionen för molekylär medicin och kirurgi, Genetik. Hippocampus, 17(4), 292-304.