

The Impalpable Testicle—Peeping Through the Key Hole

A SHAH¹ AV SHAH²

Of the various modalities for management of impalpable undescended testis, the use of laparoscopy or keyhole surgery is being widely accepted. We report our study of laparoscopy in the management of 24 impalpable undescended testes in 20 children over the past one and half years. The age ranged from 1 to 12 years. The right testis was affected in 45% of cases; left in 35% and 20% had bilateral impalpable undescended testes. Seven children underwent a single stage laparoscopic orchidopexy whereas one child needed a staged procedure. All children recovered well, the mean period of follow up was 6 months. Laparoscopy is a very valuable and probably the best method of management of impalpable undescended testicles.

Key words : Laparoscopy, impalpable testes, orchidopexy

Cryptorchidism is the most frequently seen, anomaly of the male genital system. Impalpable testis comprises approximately 20% of all cases of cryptorchidism. None of the currently available imaging studies are completely reliable to determine the presence or the exact site of the testis. Over the past few years, laparoscopy has proved to be a very important diagnostic and therapeutic tool for these children. We present our study of 20 children with 24 undescended testes managed with laparoscopy.

Materials and Methods

Over a period of 18 months, we studied 20 children with clinically nonpalpable testis. An ultrasound examination was carried out, in all patients, to determine the position of the testis, before surgery. All patients underwent a diagnostic laparoscopy.

A veres needle was introduced into the abdominal cavity through an infraumbilical stab incision under general anesthesia. Pneumoperitoneum with a pressure of 8 - 10 mm Hg was created by CO₂ insufflation. A 3 mm trocar was introduced into the

¹ Neonatal & Pediatric Surgeon

² Consultant Neonatal & Pediatric Surgeon
Prof & Head, Dept of Pediatric Surgery
NHL Municipal Medical College,
KM School of Postgraduate Medicine
& Research, VS Hospital, Ahmedabad

Dr Anirudh Shah

“Anicare”, 13, Shantisadan Society Nr. Parimal
Garden, Nr. Doctor House,
Ellisbridge, Ahmedabad - 380006
Email: anirudhshah@icenet.net

abdominal cavity through the infraumbilical incision. The abdomen was then inspected for localisation of the testis, presence of vas deference and testicular vessels and patency of the processus vaginalis using a 3 mm Storz camera, 0-degree lens and a xenon light source. Depending upon the findings, two 3 mm ports were introduced in the midclavicular line in each iliac fosse. In infants, the port sites were slightly higher to facilitate intraperitoneal movement of the instruments.

The testes were classified according to the laparoscopic findings. A testis was considered intracanalicular if the vas and vessels were seen entering the internal ring, low intra-abdominal if it was below the pelvic inlet and less than 3 cms from the internal ring. A high intra-abdominal testis is one which was above the pelvic inlet and more than 3 cms from the internal ring. Blind ending vas and vessels were suggestive of a vanishing testis, whereas a vas without any vessels was suggestive of testicular agenesis. All children subsequently underwent a definitive procedure in the form of laparoscopic or open orchidopexy, staged orchidopexy, orchidectomy or no further procedure, depending upon the findings at laparoscopy. The patients were monitored perioperatively with pulse oxymetry, apnography, non-invasive blood pressure measurement and continuous temperature monitoring. The oxygen saturation was maintained above 95%. The CO₂ levels were maintained between 25 and 30 mm of Hg.

Most of the procedures were performed as a day care case. The children were followed up in the outpatient clinic, once after six weeks and then six month after. They are evaluated

for position and size of the testis. The details of the procedure were recorded and the results were evaluated.

Results : (Table-I)

A total of 20 children with 24 clinically nonpalpable undescended testes were studied over a period of 18 months. The age ranged from 1 to 12 years. Nine (45%) had right and 7(35%) had left undescended testis. Four (20%) had bilateral undescended testes. Preoperative ultrasound could correctly locate testis in only 3 instances (12.5%). At laparoscopy, 7 (29%) testes were intracanalicular, 8(33%) were low intra-abdominal, 1(4%) was high intra-abdominal, 1 (4%) was vanishing and 7(29%) were atrophic. Five of the 7 children with intracanalicular testis underwent laparoscopic orchidopexy, whereas 2 had open orchidopexy. Of the 8 children with low intra-abdominal testes, 2 underwent laparoscopic and 6 open orchidopexy. Six of the 7 children with atrophic testis needed an exploration of the groin for excision of the testicular nubbin, whereas the child with high intra-abdominal testis underwent a staged orchidopexy by the Laparoscopic Fowler Stephen technique. There were no major complications in any of the procedures. Fifteen (75%) children were treated as a day case procedure. 4(20%) stayed overnight whereas 1(5%) child stayed for 2 days in hospital. At a mean follow up period of 6 months (range 2-18 months) all the testes were of good size and in an acceptable scrotal position.

Discussion

Cryptorchidism is a very common finding in the pediatric population. The incidence

Table-I : The Impalpable Testicle—Peeping Through the Keyhole

Sr No	Age (Yrs)	Side	Laparoscopic Findings	Procedure	Hospital Stay
1	1	R	Blind ending vas & vs.	None	Day case
2	6	R	Intracanalicular, ring closed	Groin exploration + Orchidectomy	Day case
3	4	R	Intracanalicular, ring open	Lap. Orchidopexy	Day case
4	3	R	Intracanalicular, ring open	Lap. Orchidopexy	1
5	3	R	Intracanalicular, ring open	Lap. Orchidopexy	Day case
6	7	R	Intracanalicular, ring closed	Lap. Orchidopexy	1
7	8	R	Intracanalicular, ring open	Open Orchidopexy	Day case
8	8	R	Intracanalicular, ring open	Lap. Orchidopexy	Day case
9	11	L	Intracanalicular, ring closed	Groin exploration + Orchidectomy	Day case
10	1½	L	Intracanalicular, ring open	Lap. Orchidopexy	Day case
11	2	L	Intracanalicular, ring open	Open Orchidopexy	1
12	3	L	Intracanalicular, ring closed	Groin exploration + Orchidectomy	Day case
13	6	L	Intracanalicular, ring closed	Groin exploration + Orchidectomy	Day case
14	5	L	Intracanalicular, ring closed	Groin exploration + Orchidectomy	1
15	1½	L	High intraabdominal	Staged orchidopexy	Day case
16	10	L	Intracanalicular, ring closed	Groin exploration + Orchidectomy	Day case
17	1½	Bilat.	Low Intraabdominal	Open Orchidopexy	Day case
18	2	Bilat.	Low Intraabdominal	Open Orchidopexy	Day case
19	3	Bilat.	Low Intraabdominal	Open Orchidopexy	Day case
20	12	Bilat.	Low Intraabdominal	Bilateral Lap. Orchidopexy	2

varies from 21% in preterm to 4% in term boys. About 0.8% of children have undescended testis at the age of one year. Of these, the incidence of impalpable testis is almost 20%.^{1,2} Although introduced in 1976, laparoscopy has gained wide acceptance among pediatric surgeons only since the last decade. Before the advent of laparoscopy, a laparotomy or extra peritoneal exploration

had to be performed if a testicle could not be found on groin exploration. However, laparoscopy provides exact information about the presence, position and size of the impalpable testis, with little addition to the operating time. The procedure of laparoscopic orchidopexy is an efficient and logical extension of diagnostic laparoscopy for impalpable testis.

The key feature of laparoscopy for impalpable testis is the demonstration of testicular vessels and vas. The presence of testicular vessels implies the presence of the testis at some stage in the development. Absence of testicular vessels would suggest testicular agenesis. Any further exploration can be avoided at this stage.

The most common finding is both vas and vessels entering the internal ring as was seen in 14 (58%) cases in our study. However, patency of the ring at laparoscopy correlates strongly with the presence of a viable testis.³ Vas and vessels entering a closed ring are commonly associated with an intracanalicular atrophic or vanished testis. We encountered 7 such cases in our study. Although groin exploration in all these cases is not considered mandatory,⁴ we always carry out an open groin exploration in view of the potential risk of testicular malignancy in the residual testicular stoma.⁵

When a testis is seen in the abdomen, assessment made as to should be whether it is a high and a low intra-abdominal testis, depending upon its distance from the pelvic brim and internal ring. Another laparoscopic technique uses cord mobility as a guide to cord length. Here, the testis is displaced by stretching it to the opposite internal ring. A positive “stretching maneuver” would mandate an orchidopexy. If it fails, a staged approach should be considered.⁶

For a low intra-abdominal testis, either a conventional open groin approach or a laparoscopic orchidopexy can be considered. In the present study, we found 8(33%) intra-abdominal testes, of which 2 underwent laparoscopic and 6 had open orchidopexy. However for a high intra-abdominal testis

staged laparoscopic orchidopexy is required (Fowler Stephens technique). The limiting factors for a single stage procedure in these cases is the short length of the testicular vessels as we found in one of our patients.

The initial 4 patients in the study were kept for overnight observation. However, as our experience with the procedure grew, we started to carry out the procedure on a day care basis. One child needed hospital stay for two days following bilateral orchidopexy. We have not encountered any major complications in any cases in this study. The operative time is similar to open orchidopexy. However in case of a high intra-abdominal testis, a definite line of surgical management can be planned in advance. Also laparotomy can be avoided in cases with intra-abdominal vanishing testis and testicular agenesis. Taking into consideration the above factors, it has been estimated that 12.5-47% of patients with impalpable testis benefit from diagnostic laparoscopy.^{7,8}

None of the patients in our study were subjected to MRI scan. Ultrasound showed only 12.5% accuracy for identification of the testis. Studies conducted by Siemer,⁹ Elder¹⁰ Maghnie¹¹ and Hrebinko¹² have shown the inaccuracy of imaging studies like ultrasound and MRI as compared to laparoscopy for definite diagnosis of a nonpalpable undescended testicle. Good results reported in most series establish laparoscopic management of nonpalpable testis as “state of the art” with results superior to those obtained with open technique regarding morbidity, complication rate and length of hospital stay.¹³ Over the years, since its introduction, there have been many

institutions that have examined the role of laparoscopic orchidopexy quite critically. In some people's minds, laparoscopic orchidopexy is a clear competitor to open

orchidopexy for the impalpable undescended, abdominal testicle, whereas for some it has become the gold standard.

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