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RESEARCH ARTICLE

LAPAROSCOPIC VERSUS OPEN ORCHIDOPEXY IN MANAGEMENT OF NON PALPABLE UNDESCENDED TESTIS; OVER5 YEAR SINGLE CENTRE EXPERIENCE

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ABSTRACT

Introduction: About 1-2% of boys at age of 1 year have an undescended testis (UDT). Nonpalpable testis represents a diagnostic challenge and a therapeutic dilemma. Laparoscopy was first used in 1976 to locate undescended testes.

Methods: This prospective comparative study was carried out in the postgraduate Department of General Surgery, Government Medical College, Srinagar from May 2010 to October 2015. 100 undescended testes were managed operatively during this period, laparoscopic (n=50) (Group A) and open (n=50) (Group B).Various parameters like, Operative time, Intra and post operative complications, Conversion to open were recorded, Post operative assessment like hospital stay and analgesia required. Patients were followed for 6 months.

Results: The median age was 2.51and 2.86 years in laparoscopic and open group respectively. In the laparoscopic group 26 patients had right sided non-palpable testis, 14 had the left sided and 5 patients had bilateral abnormality. In the open group 28 had right sided undescended testis, 16 patients had left and 3 patients had bilateral abnormality. The sensitivity of ultrasonography in localizing the undescended testis was 74 % as against 100% in laparoscopy. There were two minor intraoperative complications in group A as compared to one in group B. There were nine postoperative complications in total. The complications were relatively more in the open group and added to hospital stay and morbidity significantly. Most of the patients were discharged on first postoperative day (mean hospital stay 1.3 vs. 1.8 days in group A and B respectively). Laparoscopic orchidopexy group had generally lesser use of analgesics. On long term follow up a total of 3 patients developed atrophy of operated testicle; of these 2 were from the laparoscopic group.

Conclusions: laparoscopy is an extremely useful and safe modality for both the diagnosis and management of impalpable testes. However, traditional open orchiopexy is also a feasible alternative.

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INTRODUCTION

About 1-2% of boys at age of 1 year have an undescended testis (UDT); this disorder is unilateral in about 90% of individuals and bilateral in about 10% (Sweeney *et al.,* 2007; Swerdlow *et al.,* 1997; Hadziselimovic *et al.,* 1997). A nonpalpable/peeping testis is a special cryptorchoid testis thatemerges from the internal ring and is fairly mobile between the inguinal region and abdominal cavity; hence, it is not consistently palpable/seen in the inguinal region. Nonpalpable testis represents a diagnostic challenge and a therapeutic dilemma (Cisek *et al.,* 1998; Kirsch *et al.,* 1998; Docimo *et al.,* 1995).

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Almost 20% of undescended testes are nonpalpable (Esposito and Garipoli, 1997). Undescended testes are usually evaluated and managed by imaging methods and surgery, respectively (El-Anany *et al.,* 2007). Laparoscopy was first used in 1976 to locate undescended testes (Cortesi *et al.,* 1976). The optimal initial surgical approach for the non palpable undescended testis (UDT) is still debated. Laparoscopic and open surgical exploration are the two options,each with its own advocates. The advocates of laparoscopic orchidopexy report several advantages, like accurate localization of testis, testicular mobilization, and removal of atrophic remanant (Chang and Palmer, 2001). In contrast several reports state that nonpalpable UDT can be adequately managed by standard inguinal exploration (Kirsch *et al.,* 1998). We describe here our single-institution experience with Laparoscopic and open management of impalpable testes in children over a period of more than 5 years.

MATERIALS AND METHODS

This prospective comparative study was carried out in the postgraduate Department of General Surgery, Government Medical College, Srinagar from May 2010 to October 2015. All patients who presented to the outpatient department with complaints of absent testes were examined and those with non-palpable testes were included in the study. They were randomly divided using a computer based randomization program in two groups, laparoscopic (Group A)& open group (Group B) respectively. 100 undescended testes were operated during this period, open (n=50) and laparoscopic (n=50), after evaluating them for inclusion and exclusion criteria. In our study, we included all children up to the age of 16 years with unilateral or bilateral nonpalpable testes and excluded all children having any contraindication to either of the approaches in order to remove the selection bias. Moreover all the procedures were done by a single surgical team. Preoperative assessment of patients was done. Intraoperatively following parameters were observed.

- Operative time.
- Intraoperative complications.
- Conversion to open.

Post operative assessment of patients included hospital stay and post operative requirements for analgesia. Patients undergoing surgery were followed for 6 months (weekly for first month, at 6 weeks, at 6 months) and return to routine work was also noted. If the testes was found to be non viable intraoperatively, decision of orchidectomy was taken up and executed in the same sitting.

RESULTS AND ANALYSIS

The most common age group in both the laparoscopic as well as open orchidopexy cohorts was less than 5 years. The median age was 2.51 (range 1-14) and 2.86 years (range 1-15) in laparoscopic (GROUP-A) and open group(GROUP-B) respectively and the youngest patient was of nine month age in both the groups whereas the oldest was 14 and 15 years in the two groups respectively. In the laparoscopic cohort 26 patients had right sided non-palpable testis, 14 had the left sided non-palpable testis and the rest 5 patients had bilateral abnormality. In the open cohort 28 had right sided undescended testis, 16 patients had left undescended testis and the rest 3 patients had bilateral abnormality. Patients with bilateral undescended were operated in single setting. Out of 100 cases of undescended testes ultrasonography of the groin and abdomen could localize testis accurately in only 74 patients. Of the 26 missed testicles, 14 were found during initial diagnostic laparoscopy and the other 12 were found during open orchidopexy procedure. Thus the sensitivity of transcutaneous ultrasonography in localizing the undescended testis was 74 % as against 100% in laparoscopy. The location of the testicle, quality of testes, need for orchidectomy were recorded. These parameters are depicted in Table 1. Minor complications included port site bleed in one patient from the laparoscopic cohort which was managed conservatively by using laparoscopic monopolar diathermy; another patient from the same cohort had injury to the testicular artery which was then clipped using LT 300 titanium clips. All the laparoscopic procedures were completed successfully without the need for conversion. There was only one complication in the open cohort in the form of bleeding from pampini form plexus which was managed with monopolar electrocautery. There were nine postoperative complications in total; three in the laparoscopic group and six in the open group. The complications were relatively more in the open group and added to hospital stay and morbidity significantly. Four patients in the open group developed superficial wound infection which was managed by a short course of empirical antibiotics against Staphylococcus aureus. two patient developed hydrocele which regressed on conservative management. In the laparoscopic cohort, one patient developed surgical emphysema which was managed conservatively, two other patients developed port site infection which needed daily dressings. Thus the complications which occurred in the open group were relatively severe and added to morbidity and hospital stay. The difference in complications were statistically significant (p value <0.5). These complications are depicted in Table 2. Most of the patients were discharged on first postoperative day. The longest hospital stay in the open group was for 5 days in the patient who developed severe superficial wound infection. The difference was statistically insignificant between the lap and open groups (1.3 vs. 1.8 days; p >0.05). Postoperative pain was quantified using the total number of doses of analgesic, diclofenac sodium, (i/m Inj or suppository) used in the postoperative period. There was a statistically significant difference in the quantity of diclofenac used in the two groups ($p<0.05$). Laparoscopic orchidopexy group had generally lesser use of analgesics (Table 2). All patients in both groups were followed strictly after the surgery at regular intervals of 1 week for first month, at 6 weeks and at 6 months. On long term follow up a total of 3 patients developed atrophy of operated testicle; of these 2 were from the laparoscopic group. There was significant difference in the satisfaction scores in the two groups. Parents of patients undergoing laparoscopic surgery were overall better satisfied, with no incision and only three small dressings (band-aids) at the port sites. Moreover, laparoscopic orchidopexy was cosmetically better with an average scar size 1cm as against 3 cm of open orchidopexy.

Table 1. Patient parameters

Parameters	Group 1 (Laparoscopic)	Group 2 (Open)
Mean age (In Year)	2.51	2.86
Laterality (Right/Left)	26/14	28/16
Location		
Canalicular	30	32
Low abdomen	13	14
High abdomen	7	4
Quality		
Viable	44	45
Non Viable	6	5
Need for orchidectomy	6	5

Table 2. Intra and postoperative parameters

Parameters	Group A	Group B
Mean Operative time	46 min	34 min
Average blood loss	Minimal	Minimal
Intraop Complications	2	1
Postoperative complications	3	6
Orals started	Same Day	Same day
Hospital stay	1.3 days	1.8 days
Mean Analgesia required	18 mg	56 mg

DISCUSSION

Cryptorchidism is one of the most common genitourinary disorders in young boys. Although the management of boys

with palpable testes has been standardized, there are no formal guidelines for the management of boys with nonpalpable testes (Esposito *et al.,* 2008). Laparoscopy has been established as the most reliable diagnostic modality for the management of impalpable testis. Diagnostic Laparoscopy and Laparoscopic or chidopexy has begun to surpass surgical exploration as the primary treatment in boys with impalpable testes, gaining wide acceptance in the pediatric surgery community as the most effective means of relocating an intraabdominal testes to a dependent position (Schlett *et al.,* 2012; Argos *et al.,* 2003; Mehta *et al.,* 2003). Three mainlaparoscopic findings are possible: intraabdominal testis, observed in 40% of patients; intra-abdominal blind-ending cord structures, observed in 15%; cord structures entering the internal inguinal ring, observed in 45% (Hassan and Mustafawi, 2010). The right side is more frequently involved in undescended testes (45%) in comparison to left side (35%), we have found in our study that 54% of the patients with unilateral nonpalpable testes were in the right side while 30%in the left side, while 16% were bilateral. If no testis can be visualized or the vas or vessels end blindly before the ring, a thorough laparoscopic examination should be performed, especially since gubernacular blood vessels can be mistaken for blind-ending spermatic vessels (Kim *et al.,* 2005). If the blind-ending vessels are not accompanied by anassociated vas deferens, an ectopic testis should be suspected (Jordan *et al,* 1992). If an intra-abdominal testis is normotrophic, the optimal method of performing anorchidopexy must be chosen (Frey and Bianchi, 1989; Caldamone and Amaral, 1994). In our study laparoscopic determination of non-palpable testis was 100%. (Bakr and Kotb, 1999) had laparoscopic yield of non-palpable testis of 95.3%.Morphology of testis was noted in the laparoscopic group. Our study revealed normal testis in 56% of cases. Next common finding was hypo plastic testis (43%). Morphology of testis was correlated with localization of testis which revealed that features of hypoplasia were high in intra-abdominal testis. Similar findings were noted in study of Boekmann *et al.* (1996). The mean operative time in our study was 46 min in laparoscopic group and 34 minutes in open orchidopexy, Argos *et al.* (2003) reported operating time of less than one hour in unilateral non-palpable testis and less than 2 hours in bilateral non-palpable testis. No major surgical complication was observed in either group. The patients were on regular follow up. Postoperative testicular atrophy was seen in3 patients with follow up till the study time; one from the open group and two from the laparoscopic group. The difference is though statistically insignificant, Mehta KD et al. 15reported no surgical complication in his study. This substantiates the fact, that complication rates are markedly reduced in good centres with high expertise. The average postoperative hospital stay in our series was 1.3 days (range 1-2 days) for laparoscopic group and 1.8 days (range 1-5) for open orchidopexy, Koyama T reported hospital stay of less than one day in his patients24. Time taken to return to daily activities was less in patients who underwent laparoscopic orchidopexy (1.1 weeks) as compared to patients who underwent open orchidopexy (1.5 weeks).

Conclusion

In conclusion, laparoscopy is an extremely useful and safe modality for both the diagnosis and management of impalpable testes. Laparoscopic orchiopexy is a successful, eventless approach for non palpable undescended testis, However, traditional open orchiopexy is also a feasible alternative.

Ethical approval: The study was approved by the Institutional Ethical Committee

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