Role of laparoscopic in diagnosis and treatment of undescended testis in children at Viet Duc Hospital

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Abstract

Introduction: Evaluating the role of laparoscopic for diagnosis and treatment of undescended testis in children.

Material and Methods: Restrospective study, between 6/ 2014 and 6/2017. All the patients are aged from 1 to 16 years with undescended testis underwent laparoscopic surgery for diagnosis and treatment in Deparment of pediatric surgery – Viet Duc hospital enrolled.

Results: Of 95 patiens in total had 106 undescended testis diagnosed and treated by laparoscopy. The mean age of patients was 7,5 ± 3,8 years. 44,2% undescended were on the left side, 44,2% were on the right and 11,6% were undescended bilateral. The correct diagnosis by ultrasound accounted in 79,4%. The locations of testis diagnosed by laparoscopic are : intra abdomen in 45,3%, deep inguinal orifice in 16,9%, extra inguinal orifice in 26,4%, no testicle found in 11,4%. The mean time of operation were 67,33± 28,01 pht. Scrotal positions were achieved 74,5%, remove atrophic testis accounted in 7,6%. Stephen- Flowler technique including step I were in 4,7%, step II in 1,9%. The outcome evaluated by testicular positions following 3 months after operation are : good in 79,2%, moderate 13,2%, poor in 7,6%; By classification of Aubert are : good in 81,1%, moderate in 11,3% and poor in 7,6 %.

Conclusion: Laparoscopic surgery is not only a highly sensitive diagnostic method to find accurately the location and size of the testes, but also the most effective method to treat impalpable undescended testes.

I. Introduction

Hidden or undescended testis happen when the testes abnormally stop descending to the scrotum during the fetal period, with the occurrence rate of 3.4% in full-term babies, and more common in premature babies, with the rate of 33%. Among that, impalpable testes account for 20% of the cases [1],[2]. Laparoscopic surgery is not only a highly sensitive diagnostic method to detect accurately the location and size of the testes, but also the effective procedure to treat impalpable testes. At the Department of Pediatric surgery of Viet Duc Hospital, this method, which has been used and constantly improved since 2005, showed good results.

II. Materials and method

Subjects:

Children aged from 1 to 16-year-old undewent laparoscopic surgery for diagnosis and treatment due to undescended testes are enrolled.

Time and venue of study: from 6/2014 to 6/2017, at the Department of Pediatric surgery of Viet Duc Hospital.

Method: Descriptive retrospective study.

Procedure:

Laparoscopic surgery was indicated for those with impalpable testes, undetectable on ultrasonography, located in deep inguinal ring or in the abdomen.

Laparoscopic surgery with 3 trocars (5mm and 3mm) has been used to check the abdominal cavity to locate the testes, arteries, vas deferens and the closure of the vaginal process. If the vaginal process was closed, the terminal of testicular arteries was checked. If the arteries ended at the deep inguinal ring, it meant that the testes had moved out of the abdomen, the laparoscopic procedure was then stopped and convert to open surgery to check the test in the inguinal canal. If the testicle was found in the abdomen, the vessels were dissected as close as possible to the origin, the vas deferens was dissected as close to the base of the bladder as possible to provide enough length to take the testicle to the scrotum.

In the case of testicular vessels are short, Stephen – Fowler technique is indicated so the testicular vessels were clipped from 1 – 2cm to the testicle.

Postoperative assessments, including clinical examination and ultrasonography should be done in the first 1 – 3 months after the surgery and scheduled every 6 months.

The result of the operation was assessed by the location of the testicle:

Good: The testicle is in the scrotum.

Average/moderate: The testicle is descended in the base of the penis.

Poor: The testicle is still impalpable.

The outcome could be also assessed by the Alberts classification (1982) as follows:

Good: The volume of the ectopic testicle is large than 2/3 of the size of normal testis.

Average: The volume of the ectopic testicle is large from ½ to 2/3 size of the normal one.

Poor : The volume of the ectopic testicle is less than ½ of the normal one

III. Results

Clinical and imaging findings: 95 patients with 106 undescended testicles were operated on by laparoscopic surgery.

Table 1: Demographics

Description		N	%
Side of the ectopic testicle	Right	42	44.2
	Left	42	44.2
	Both side	11	11.6
First detected by	Family members	70	73.7
	Health staff	25	26.3
Gestation length	Full-term	18	18.9
	Premature	77	91.1
Age at surgery Average: 5.1 ± 3.5	< 2	30	31.6
	2 – 6	29	30.5
	> 6	36	37.9
Previous surgery to repair undescended testicle	Yes	17	16.04
	No	89	83.96

Table 2: Preoperative ultrasonographic diagnosis

Description		N	%
Testicle is not found		38	35.8
Found	Intra-abdominal cavity	27	25.5
	In deep inguinal ring	31	29.2
	In the inguinal canal	10	9.4

Table 3: Associated congenital diseases

Description	N	%
Hypospadias	4	4.2
Patent vaginal process	9	9.4
Meconium peritonitis	1	1.1
Other	4	4.2
Total	18	18.9

Laparoscopic surgery

Table 4: Location of the testes

Description	N	%
In deep inguinal ring	18	16.9
Intra abdominal cavity	48	45.3
Not in the inguinal canal	28	26.4
No testicle found	12	11.4

Table 5: Surgical procedure

Description	N	%
Diagnostic only	12	11.3
Removal of the ectopic testicle	8	7.6
Descending the testicle	79	74.5
Fowler – Stephen I	5	4.7
Fowler – Stephen II	2	1.9

Average surgery duration: 67.33 ± 28.01 minutes (20 to 120 minutes).

Average length of hospital stay: 1.98 ± 1.08 days (1 to 5 days).

There was no complication in this series.

Postoperative re-assessment:

Average time of postoperative re-assessment: 20.73 ± 10.76 months (3 to 24 months).

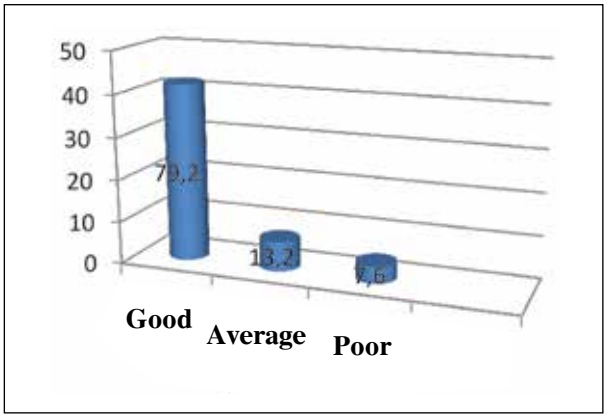

Chart 1: Assessment of result based on postoperative location

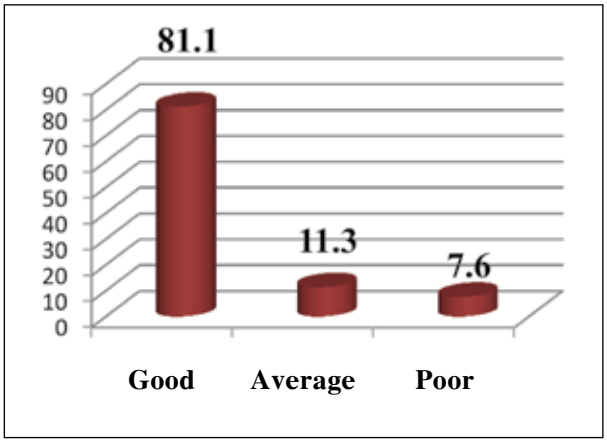

Chart 2: Assessment of result based on Aubert classification

IV. Discussion

Diagnosis of undescended testes by clinical and ultrasonography check:

Early detection of undescended testes can be at birth. In the first year of life, the testicle will be moved to the scrotum. If not when the child is at 1 year-old, it needs to be treated. In our study, the rate of detection by health staff was in 26.3%, in comparison to 73.7% of cases were detected by patientsfamily. Our finding was similar to those of Le Tat Hai (30.5% versus 69.5%) and Le Van Truong (28.85% versus 71.15%). The premature birth had a high rate of undescended testes, according to Le Minh Trac [3], the rate of undescended testes was inversely correlated with the gestation age at birth of the babies. Clinical and ultrasonography examination is helpful to diagnose the undescended testes in children, however MRI and computer tomography scan were not more specific as ultrasonography [4]. In series of JS Elder, ultrasonography could only detect 18% of the intraabdominal testes. According to Kanemoto K, ultrasonography was able to detect undescended testes with the sensitivity of 76%, the specificity of 100% and the accuracy of 84%. In our series, ultrasonography accuracy was in 79.4%. Also the testes in the deep inguinal ring was easier to detect than those in the pelvis. The impalpable testes were either atrophic or remained in the pelvis. The atrophic testes among impalpable testes was accounting for 20% according to other authors. Our finding was in 14.28%.

The role of diagnostic laparoscopy:

By laparoscopic surgery we could identify the location, size, vessels and the spermatic cord in order to decide the possibility to take down to scrotum, to remove, implementation of Fowler – Stephens or to conventional surgery to avoid missing any testes. According to Holcomb, laparoscopy surgery has detected the impalpable testes in 35 patients, hence appropriate procedures are indicated. Tsujihata [7] also detected 23 cases of impalpable undescended testes, in which 8 testes are atrophic and out of inguinal canal, 7 are intraabdominal and

required to perform in 2-stage Fowler Stephen surgeries. Laparoscopy did not detect any testicle in 12 patients (11.4%), while ultrasonography was not helpful in 38 patients (35.8%). In many cases, no testicle was found during laparotomy, however the location of intraabdominal testes were found by laparoscopy. Perovic and Janic (1994), did not find any testicle with conventional surgery in 12 patients, however they have found the intraabdominal testes in 6 cases by laparoscopy. Le Tat Hai also found intraabdominal testes in 4 cases by laparoscopy, however he was not able to find by open surgery. There were 9 patients of our series the testes were not found with open surgery, and laparoscopy helped to find in the intraabdominal location, so the laparoscopic surgery is valuable procedure as a golden standard to diagnose the intraabdominal testes. Additionally, It is useful to detect the other comorbidities, for example, meconium peritonitis (1.1%), inguinal hernia (9.4%), to assess the closure of the deep inguinal ring, and especially the associated genital malformations, assessing the disorders of sex development (DSD) to plan an appropriate treatment.

The role of laparoscopy in the treatment of undescended testes:

By checking the length of testicular vessels we can decide the testicle can be taken down or not. In case the location of testicle is related high within the abdomen cavity , only laparoscopy is used to dissect the testicular arteries and vas deferens intraabdominally before cutting the suspensory ligament of the testicle. The rate of testicle not descended down in our study was higher than the result of Nguyen Thanh Liem (56%). In case of vessels too short, Fowler – Stephens procedure was indicated [5], we did not dissect the testicular vessels, and we clipped the vessels about 1 – 2 cm near the testicle. Dissecting the vessels in stage 1 may increase the risk of testicular atrophy in stage 2. In our series, there were 7 testes with short vessels (6.6%), of them, 5 were repaired with 1-stage Fowler – Stephens procedure, the other 2 were repaired with 2-stage Fowler – Stephens procedure [6]. The rate of undescended testes with short vessels in our study was similar to Godboles (6.9%) but less than Nguyen Thanh Liems (16.9%). We found the 2-stage Fowler – Stephens procedure safe because of the increase flow through the connection between the artery to vas deferens, the arteries to the scrotum and testicular artery in the waiting time. Among our patients, 17 patients (17.9%) had history of previous repair but was not able to detect the testicle or the testes located out of the scrotum. In such as the case, we have performed laparoscopic surgery again to dissect and prolong the vessel intraabdominally. The duration of surgery was 67.33 ± 28.01 minutes, similar to other authors. There was no complication and the length of hospitalization was 1.98 ± 1.08 days, similar to the study of Dao Trung Hieu (40.2 hours) and Nguyen Thanh Liem (3 days).

Result assessment:

The assessment was 3 to 34 months later, with an average time was 20.73 ± 10.76 months, longer than Niedzielki, but only one third shorter than Le Tat Hai, Christian Radmayr. The longer reassessment period could make more accurate result. It takes a good enough time to know the ability of fertility.

Assessment by the location of the testes, there were good results in moving down to the scrotum in 79.2% similar to other authors in home.

Assessing volume of the testes by ultrasonography showed the highest TAI index of < 33%, with the highest TAI index in the age group of > 10 years old, similar to the study of Niedzielki and Le Tat Hai. Re-assessing by Aubert classification showed a good outcome in 81.1%, similar to the study of Le Tat Hai (80.9%), but less than Radmayr (96.5%), Fowler – Stephens II made good result for 93% of the cases with both atrophic testes.

V. Conclusion

Laparoscopy surgery is a good method in both assessing the location of the testes and repairing the defects at the same time. It could make good result as well as good cosmetic aspects.

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