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Laparoscopic Orchidopexy: The Treatment of Choice for the Impalpable Undescended Testis

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ABSTRACT

Objective: Management of the impalpable testis often represents a significant diagnostic and therapeutic challenge for the radiologist and surgeon. The aim of this work is to present the superior value of laparoscopy as a single tool for the diagnosis and treatment of the impalpable testis.

Methods and Procedures: Thirty-three patients with 43 impalpable testes are included in this study. For each patient, magnetic resonance imaging (MRI) then laparoscopy were performed. Either the testis or blind-ending cord structures are searched for. The testis was either brought down to the scrotum or removed depending on the condition of each patient.

Results: MRI detected 16 out of 43 impalpable testes (37.2%). Laparoscopy, on the other hand, detected 18 intra-abdominal testes, 7 inguinal and 16 blind-ending cord structures either above or below the internal inguinal ring. Blind-ending cord structures suggested a vanished testis. Orchidopexy was done for 23 cases, orchidectomy in 18 cases and laparoscopy only in 2 cases.

Conclusion: Laparoscopy seems to offer a safe and reliable diagnostic and therapeutic option to patients with impalpable testes. Intra-abdominal dissection allows more testes to be brought down to the scrotum. The procedure is best viewed as laparoscopy-assisted, as orchidopexy has to be done in a conventional manner.

Key Words: Laparoscopy, Orchidopexy, Undecended testes.

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INTRODUCTION

Cryptorchidism affects 3% of full-term male newborns. Impalpable testes represent 20% of all cases of cryptorchidism.[1,2] Palpable testes are easier to relocate. The management of impalpable testis remains controversial. Localization of the site of the impalpable testes helps the surgeon plan the operation most suited for each patient. Ultrasonography, computed tomography, testicular angiography and magnetic resonance imaging (MRI) have all been used with varying success for this purpose.[3,4] This is usually followed by surgical exploration through either an inguinal or an abdominal approach. The aim is to relocate or remove the testis.

Laparoscopy was used by many as a method for the localization of the impalpable testes prior to exploration.[5,6] The recent surge of laparoscopic surgery encouraged surgeons to use laparoscopy for both the diagnosis and treatment of impalpable testes.[7-9]

The aim of this study is to present our experience with laparoscopy as a superior single tool for the management of impalpable testes.

MATERIALS AND METHODS

From December 1994 till December 1996, 33 patients were included in this study. Their ages ranged from 2 to 39 years (mean 6.7 years). Twenty-three of these patients had clinically suspected unilateral undescended testes, 8 on the right side and 15 on the left side. Ten patients had clinically suspected bilateral undescended testes. One patient had a previous inguinal exploration that revealed neither testis nor spermatic cord structures. In all patients the testes were not palpable at thorough examination, even under general anaesthesia.

Magnetic resonance imaging was performed on all patients to localize the testis. All patients were then operated upon. Under general anaesthesia, pneumoperitoneum was created and an infraumbilical incision was done. Through this port, a 5 mm 0-angle scope was usually passed. In four patients with age > 12 years, the initial port was a 10 mm one, and the scope was a 10 mm 0-angle scope. Careful laparoscopy was done to locate

the testis and the spermatic cord structures from the internal inguinal ring and proximal to it. Search was usually carried out up the lower pole of the kidney. Gentle pressure on the inguinal region was exerted to force testes just inside the internal ring proximally. If the testis was found, it was assessed. The testis was considered normal in relation to the other testis (in unilateral cases) or according to the expected size at that age (in bilateral cases). If no testis or spermatic cord structures were found, the testis was assumed absent and procedure was terminated at this stage. If an abnormal testis or blind-ending cord were found, orchidectomy was performed, removing the abnormal testis or nubbin of tissue at the end of spermatic cord structures. This was considered a vanished (atrophic) testis. If a normal testis was found, orchidopexy was carried out. Accessory ports, each 5 mm in diameter, were inserted in both the right and left upper quadrants **(Figure 1)**. A 12 mm port was used to close a patent processus vaginalis if this was present. The gubernaculum was identified, divided and used for traction on the testis. The spermatic cord was carefully mobilized. Through a small scrotal incision, a curved hemostat was guided into the peritoneal cavity medial to the inferior epigastric vessels. The gubernaculum was grasped and pulled through the "new" inguinal ring into the scrotum. The testis was placed in a subcutaneous pouch taking care to avoid twisting the spermatic cord. If the vessels are too short to do orchidopexy, either a staged procedure was planned or a Fowler-Stephens procedure was carried out. If the testis was inguinal in position, as evidenced by spermatic cord structures entering the internal ring, traction was exerted assisted by external pressure on the inguinal region. If the testis could be delivered through the internal ring, the gubernaculum was divided, used for traction, and the procedure was completed laparoscopically. If this was not possible, a small inguinal incision was done to complete the procedure. Wounds were closed by subcuticular 4/0 absorbable sutures.

Patients were usually discharged after 24 hours.

RESULTS

MRI located 16 out of 43 impalpable testes (37.2%) **(Figure 2)**. MRI failed to detect spermatic cord structures. Ten testes were intra-abdominal, while two were at the internal inguinal ring and four within the inguinal canal.

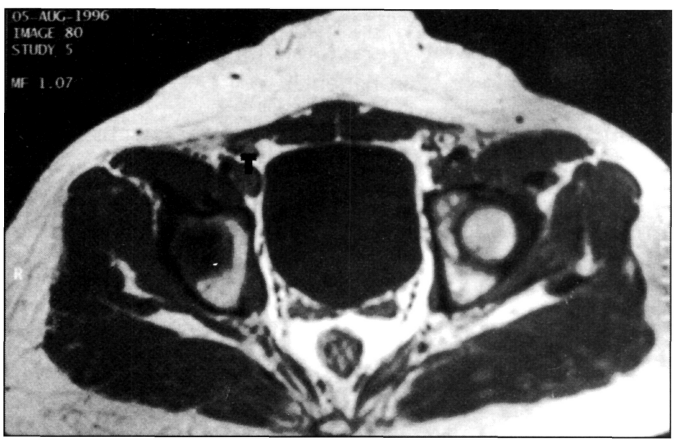

Figure 2. Intra-abdominal testes detected by MRI. T= testis

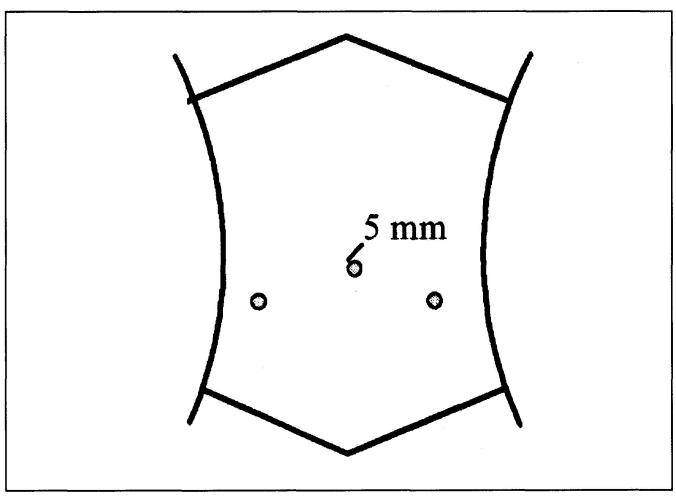

Figure 1. Sites of ports.

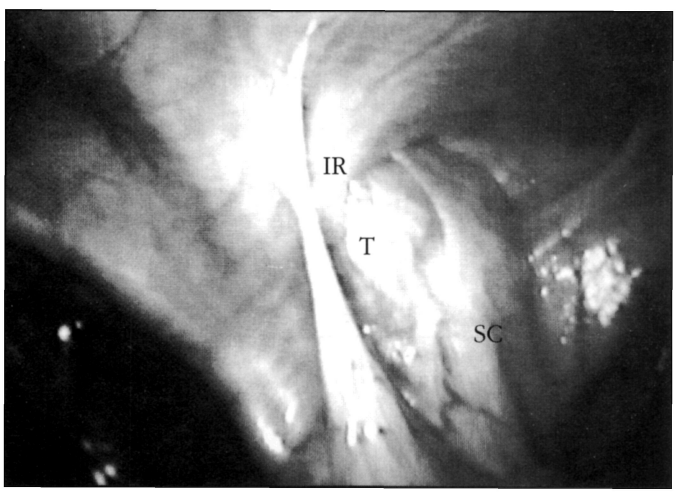

Figure 3. Laparoscopic view of intra-abdominal testis.
T = testis, IR = internal ring, SC= spermatic cord

Laparoscopy was successfully completed in all cases **(Figure 3)**. **Table 1** shows the laparoscopic findings in these cases. Laparoscopic orchidopexy was carried out for 21 patients at the same sitting (i.e., single stage orchidopexy). One patient needed a staged procedure because, after mobilizing the spermatic cord structures, the testis could not be brought to the bottom of the scrotum. The second stage was performed in a conventional manner six months later, and the testis was moved to the scrotum. Another patient judged at laparoscopy to have very short spermatic vessels required a single stage Fowler-Stephens procedure. The mean operative time was 45 minutes (range 30-75). Patients were allowed oral fluids at the night of the operation and were discharged at one day after the procedure. Patients were followed up for a mean period of 11.2 months. At follow-up, all but one of the testes were well down in the bottom of the scrotum. In one patient, the testis was in a high scrotal position. All testes were of normal size.

Orchidectomy was done for 18 cases. In 2 patients the testis was hypoplastic, while in 16 patients the nubbin of tissue at the end of blind-ending cord structures was removed. No malignancy was detected in all cases.

Thirteen patients (30.2%) needed an inguinal incision to complete the orchidopexy or orchidectomy. The incision was small and needed no extension. In two patients no testes, no vas deferens and no spermatic vessels could be visualized during laparoscopy up to the lower pole of the kidney. The testis was assumed absent and the procedure was terminated. This included the patient with history of previous inguinal exploration.

There was no morbidity and no mortality in this series.

DISCUSSION

Undescended testis is one of the most common genitourinary anomalies in male infants.[1,2] Non-palpable testes offer a greater diagnostic and therapeutic challenge for the radiologist and the surgeon than palpable undescended testes. The ideal imaging method to localize impalpable testes has not been found. Ultrasonography, computerized tomography (CT), gonadal angiography and magnetic resonance imaging (MRI) have all been used to localize the impalpable testis with limited success.[4] Ultrasonography is limited in the evaluation of intra-abdominal testes. CT can detect intra-abdominal testes but is associated with radiation exposure. MRI could localize the impalpable testes. It is non-invasive and utilizes no radiation. On the other hand, failure of MRI to localize the testis does not exclude its presence. It is also limited by its high cost. In our series, MRI was able to detect only 37.2% of the testes. It could not predict atrophy or absence of the testis. Laparoscopic localization of the undescended testis has proven its accuracy in various studies.[6,8,10] In this series, laparoscopy detected testes that were not localized by MRI. The ability of laparoscopy to visualize the spermatic vessels and vas deferens means a vanished (atrophic) or absent testis will not be missed. Abdominal testes comprised 53.5% of the impalpable ones. It is this group of patients that benefit more from the laparoscopic approach.

Impalpable testes have an increased risk of malignant transformation and infertility. The surgical treatment for the impalpable testis is controversial.[11,12] The aim is to place the undescended testis in a normal intra-scrotal position or to remove it. Relocation of the testis is usually difficult due to the long gap that has to be bridged. This is classically done by exploration through an inguinal or abdominal incision and extensive retroperitoneal dissection, which is mostly blind. Orchidopexy may have to be performed in stages or an auto-transplantation of the testis may be essential. In recent years, laparoscopy has replaced many of the traditional procedures for its obvious advantages in reducing morbidity, hospital stay and better cosmetic outcome.[13]

During the course of laparoscopic orchidopexy, mobilization of the spermatic cord structures is done under visual control and can be carried out to high levels that cannot be done through the open operation. Laparoscopy can be

Table 1.
Laparoscopic Findings in 43 Cases.

Abdominal (53.5%)			**Inguinal (41.9%)**			**Absent (4.6%)**
Normal	Hypoplastic	Vanished	Normal	Hypoplastic	Vanished	
17	1	5	6	1	11	2

used to clip the spermatic vessels in the first stage of staged Fowler-Stephens orchidopexy.[9] Some authors[5] question the value of exploration of the inguinal region if a hypoplastic cord and vas exit the inguinal ring. The remote possibility of malignancy should always be born in mind. There is evidence that nubbin of tissue found at blind-ending cord structures may contain testicular remnant[14] and, hence, an inguinal exploration and orchidectomy may be justified. Preliminary reports about the use of laparoscopy to diagnose and complete orchidopexy are encouraging.[15,16] Orchidopexy could be successfully completed in 23 of our patients (53.5%), and in 22 of them the procedure was completed laparoscopically. None of our patients needed narcotic analgesics following the procedure. Patients were able to resume oral intake at the night of the procedure and enjoyed a short 1-day hospital stay. Added to its superior diagnostic and therapeutic potential, laparoscopy has a cost advantage. The total cost of laparoscopic orchidopexy averaged $1200. MRI costs approximately $300. Patients undergoing conventional orchidopexy stay in the hospital for 1-3 days, and the total cost ranges from $1200-1500.

Orchidectomy revealed no malignancy, but we believe that it is still justified even for the vanished testis.

Laparoscopy cannot totally avoid a surgical incision, but it will make it unnecessary in many cases. Even if a surgical incision is needed, it will not be an extensive one. Only 13 of our patients needed an inguinal incision to finish the orchidopexy or orchidectomy. It seems that patients in this age group tolerate the procedure well, with no morbidity and no mortality seen in any of our cases.

In the view of the results of this study, our present policy is to proceed to laparoscopy rather than other imaging modalities if the undescended testis is impalpable.

CONCLUSION

Laparoscopy for the impalpable undescended testis offers a simultaneous diagnostic and therapeutic tool. It obviates the need for invasive and/or expensive diagnostic imaging and saves the patient an extensive surgical procedure with equally good results. It is particularly valuable in bilateral cases. We recommend laparoscopic orchidopexy as the treatment of choice for the impalpable undescended testis.

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